" ASSESSMENT OF RELATIVE SIGNIFICANCE OF DELAYING FACTORS IN HILLY ROAD CONSTRUCTION "

Project Report Submitted in Partial Fulfillment of Requirements for the Degree of

Masters of Technology

In

Construction Technology and Management

Under the Guidance of

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And

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CERTIFICATE

This is to certify that the work which is being presented in the project title **" ASSESSMENT OF RELATIVE SIGNIFICANCE OF DELAYING FACTORS IN HILLY ROAD CONSTRUCTION "** in partial fulfillment of the requirements for the award of the degree of Master of technology and submitted in Civil Engineering Department, Jaypee University of Information Technology, Waknaghat is an authentic record of work carried out by Vinay Thakur during a period from Jan.2018 to May2018 under the supervision of **Prof. (Dr.) Ashok Kumar Gupta** Head of Civil Engineering Department and **Mr. Aakash Gupta (Assistant Professor)** Jaypee University of Information Technology, Waknaghat.

The above statement made is correct to the best of my knowledge.

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ABSTRACT

Delays are inherent part of construction management projects even with much acquire facts in project management. But it is one of the major challenges in hilly road construction projects. This cannot be neglected and is critical to take note of that physical and financial size of ventures today is with the end goal that it is driven under the stage of benefit to the parent association, and for government ventures, accomplishment of cost, time, and degree.The purpose of this paper is to identify the factors that contribute to delay of hilly road construction projects in Himachal Pradesh and the effects of delay. In this paper, the attempt has been made to find out the factors which are most responsible in delay of hilly road construction considering various activities such as clear & grubbing, excavation, subgrade, sub-base etc by using critical path method, primavera software and monte-carlo simulation method.

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CHAPTER-1

1.1 INTRODUCTION

Hilly road construction project in every project the benefits time is very essential for project estimation. All essential factors are generally influence by the venture finishing stage, that is, the time taken to get the task finish for utilization. Study for the hilly road development extends everywhere throughout the world confronting delay in their culmination time. Delay is one of the significant issue to the hilly road ventures. Delay is built up, expensive, complex and a hazardous issue that is frequently experience the hilly road ventures. On the off chance that postponement happens amid the hilly road venture, it can be redressed by quickening the speed of work nearby or by offering the contractual worker expansion of time development hilly road venture. An undertaking is said to have been delayed if the fruition time concurred by gatherings to an agreement is surpassed.Delay can happen when pace of work on site backs off without totally halting activities on hilly road development site venture. In hilly road development venture contract worker and customer both are in charge of task delay. Be that as it may, sometimes, they may not be the reason for this issue. Contractual workers have lawful obligations to finish the hilly road extends on plan yet a portion of the things are hindered by delay. Hilly road delay as a rule happens when a customer's monetary power is less and can't make installment to the contractual worker on time. This it happens when customer's roll out wide outline improvements without considering the cost effect of such changes hilly road venture. It was additionally underscored that, where there are subsidizing issues; data delay, poor development administration, arrangement of government, pay issues and contradiction between gatherings' postponements in hilly road construction task might be unavoidable.

1.2 LITERATURE REVIEW

1.Saleh Al Hadi Tumi, et.al (2009)this paper a few purposes for the deferrals caused in these destinations and proposes some suggestion, which may empower the contractual worker association to create in road intensity for the accomplishment of one of the real objective in development of an undertaking, on 'time' finishing. Additionally explore is expected to research the confinements and potential changes to reasons for delays inside every development site.[1]

2.P.J.F.Wingate The investigations demonstrated that the general pattern among those utilizing the critical path method in road development plans was from the utilization of substantial definite system charts requiring PCs and towards little comprehensively based graphs figured physically. Isolate graphs were, in any case, broadly used to appear in detail parts of undertakings, for example, spans, which required more definite arranging. Some utilization was being made of the critical path method for programming the arranging and configuration phases of activities and in addition for their execution. The technique was observed to be an important guide to the programming of road development ventures gave its degree and restrictions were figured it out. This report additionally talks about conceivable future patterns in the lines of the critical path method. It recommends that, with more prominent experience of critical path method systems, organizers may perceive the specific preferences offered by PCs and return to their utilization.[2]

3.Msafiri Atibu Seboru (2015) The dominant part of road development extends in Kenya don't get finished inside the at first set focuses of time. Task delays disappoint the procedure of improvement, have an unlimited cost suggestion to the general public, and furthermore prompt loss of notoriety of the gatherings engaged with the activities' execution. The motivation behind this investigation was to explore the elements causing delays in road development extends in Kenya. Undertaking delays are a typical issue universally in the development business in current circumstances. Exploring the explanations behind postponement has turned into a critical commitment to enhanced development industry execution. The best five reasons for venture delays were seen to be installment by customer, moderate basic leadership and administration in customer association, deficient arranging and booking, and rain. It is prescribed that customers ought to enhance their money related administration frameworks with the goal that they can pay contract workers in an auspicious way. Administration and formality ought to be diminished in customer associations with a specific end goal to accelerate the moderate basic leadership process. Effective administration of the development procedure will likewise prompt a

diminished in frequencies of cases. Contract workers ought to get ready satisfactory plans and calendars which can likewise be utilized to limit the effects of rain.[3]

4.Chrzanowski and Johnston (1986) represented repetitive activities as lines of constant or varying slopes on the two axes, distance against time. They suggested that discrete activities may be shown at their appropriate times and locations on the linear schedule itself and then referred to a network schedule for more details. An illustration was made by actually applying LSM to a road construction project consisting of upgradation of two roads. The entire project was broken down into five phases with necessary tasks planned to be completed in that phase. A CPM network was presented at first for the phases and later an LSM model was discussed for each phase with their components. The authors compared the bar chart progress schedule with the actual progress with the LSM and estimated a completion delay of one year for the project .The **3**simplicity of the method and its advantages of application to such types of projects were revealed.[4]

5.Benjamin Boahene Akomah*, et.al (2016)Road development ventures assume essential part in the financial improvement of Ghana however one noteworthy test to road development ventures is delay. The reason for this paper is to recognize from contractual workers' perspective the variables that add to delay of road development ventures and the impacts of deferral. The investigation utilized organized poll review. Respondents were chosen utilizing arbitrary testing method. The paper recognizes augmentation of time, cost overwhelm, and harm to organization's notoriety for being the primary impacts of road ventures.[5]

6.Kallantzis et al (2007) A linear project generator was created to deliver a gathering of twenty five arbitrary direct ventures to break down and think about their basic ways . They additionally looked at the basic way of the kallantis lambropoulos dreary venture show against the CPM arrange demonstrate.[6]

7.Harmelink and Rowings (1998) developed the linear scheduling method to provide a level of analytical capability to the linear scheduling process. This paper documented a method by which a controlling activity path can be determined for linear projects similar to the critical path method. This fundamental ability helped in the identification of controlling and non controlling segments and determination of floats and provided a means of updating linear schedules.[7]

8.Yamin and Harmelink (2001) reported an alternative-scheduling tool designed to be used for specific types of project that could prove to be more practical than CPM solutions. They provided a comparison of the CPM and the linear scheduling model by identifying critical attributes both at higher management level and project level. The right type of scheduling tool that can be adopted based on the characteristics of the project was proposed by them in this work highlighting the essential requirements to be satisfied with project management and scheduling. They scheduled two projects with each method as an example and discussed the differences. Their conclusions support that specialization of scheduling tools could be beneficial for the project manager and the project. They concluded that LSM lacks resource management capabilities and there was no provision to incorporate duration uncertainty as PERT does for network methods.[8]

9.Kenneth Ssemwogerere (2011) this paper the Author utilizing vis-à-vis meets and definite investigation of information got from venture documents exhibits a case for speeding up of works as opposed to broadening the undertaking contract period. This is bolstered by the way that a large portion of the huge development firms in Uganda have the ability to finish the ventures dealt with in a considerably shorter time on the off chance that they see a monetary advantage in early fruition. [9]

10.Desai Megha, Dr Bhatt Rajiv (2013) consider traces the significant reasons for delay for private development extends in Indian setting. In view of writing study and from meeting of specialists, 59 causes were distinguished under 9 noteworthy gatherings. Promote philosophy is recommended to work out basic causes from accessible ones by two procedures: Relative significance file and Importance file as a component of seriousness file and recurrence record. Review questionnaire is readied in view of these methods. It is proposed to do positioning of reasons for delay from two unique systems in the following period of research.[10]

11.Assaf et al. (1995) directed the investigation in two stages. The primary stage incorporated a writing pursuit and meetings. The primary stage distinguished 56 reasons for delay. In the second stage a poll was created utilizing these postpone causes. His degree was constrained to extensive open building projects in the Eastern Province of Saudi Arabia. The aggregate populace comprised of contractual workers, planners/builds (An/Es), and open proprietors (Government organizations).[11]

12.Alaghbari et al. (2007) dispersed the survey among government bodies, principle contract workers, specialists and engineers who were associated with the building frameworks development ventures. Keeping in mind the end goal to achieve this, the analysts reached proficient organizations, operators and government bodies. The example was confined to building framework organizations. The respondents were contractual workers, specialist, designers, subcontractors, architects and draftsmen who were engaged with building framework development ventures. [12]

13.Frimpong et al. (2003) built up a poll of 26 factors outlined from past preparatory investigations led in groundwater drilling ventures in the vicinity of 1970 and 1999 in Ghana. The survey was coordinated towards three gatherings in both open and private associations: proprietors of the groundwater ventures, counseling workplaces, and contractual workers working in the groundwater works. [13]

14.Long et al. (2004) built up their poll study to explore a few issues identifying with extensive development ventures concentrating just on the issues experienced. To suit the Vietnam development conditions, the preparatory survey was pilot tried. Six experienced experts in the Vietnam development industry were associated with the pilot test. Their remarks were utilized to reconsider and set up the last survey. Reactions to the poll were then gathered and broke down. The investigation included positioning the issues as far as level of event and level of impact. [14]

15.Odeh Battaineh (2002) and appropriated the survey to an irregular example of 100 contract workers and 50 experts speaking to various specializations in vast ventures. The example size of every specialization is corresponding to the conveyance of the number of inhabitants in the distinctive specializations. Given the example estimate, the examples were chosen arbitrarily from the populace in every specialization. Sambasivan and Soon (2007) embraced a similar technique in their investigation on the circumstances and end results of development delays.[15]

16.Chan and Kumaraswamy 1997 and 2002. In the prior investigation, a pilot think about was done in mid 1994 to research the important reasons for development deferral of both building and structural designing undertakings which were finished in Hong Kong in the vicinity of 1990 and 1993. The last review was supplemented by site visits by industry specialists with the point

of distinguishing the central elements encouraging speedier development in Hong Kong ventures. [16][17]

18.X. Regina Mary et al (2015) this investigation Schedule made by utilizing systems that lessen the limitations causes for the task to finish prior of five to seven months from the genuine base calendar of the venture and in this way increment the benefit result from the undertaking. Further, with the administration on the work asset of talented, untalented male laborer and incompetent female specialist in the development exercises, the cost spent on the work assets diminishes by 5% of the real cost spent on the work assets. Utilizing a product deals with the work effectively and it decreases the data imperatives between the administration and the site individuals which incredibly add to the undertaking achievement.[18]

19.Olajide et al (2013) this investigation uncovered 20 key factors that reason non-forgivable deferrals. The resultant impacts of non excusable postponements are time invade, cost overwhelm and debate, among others. Guaranteeing satisfactory money related sources, drawing in equipped undertaking administrators and making every single fundamental asset accessible are the absolute most critical methods for limiting nonexcusable postponements. Since non-forgivable postponements are particular to contractual workers, this investigation reasons that contract workers should survey their exercises with the goal that development work won't be deferred.[19]

20.Kenny Wong et al (2012) this investigation can be of gigantic help to the professionals (customers, contractual workers and experts) and academicians. From one perspective, the professionals can better comprehend the defer factors and attempt endeavors to lessen the frequencies of postponements. While then again, scholastics can direct comparative investigations and recognize the circumstances and end results of deferrals, or spotlight on a specific technique in limiting postponements.[20]

21.Chidambaram Ramanathan, et al (2012) This investigation has recognized 113 particular components ordered into 18 bunches in charge of postponements through basic audit of 41 past research considers performed in the applicable field. This gives all the mix of elements and classifications in charge of development delays. In any case, this basic survey of forty one investigations likewise shows that none of the investigations can be summed up and specifically

appropriate 'as seems to be'. This displays a solid body of evidence against feeling studies when as for this situation, factual break down of genuine activities should be possible which conceivably could produce important answers.[21]

22.Owolabi James et al (2014) The result of investigation from this investigation can be said to be of extraordinary pertinence to the development business. Larger part of the respondents are completely engaged with the development business with no less than 10 years of development encounter, implying that the respondents have abundance of learning and could supply the important data on the inquiry conveyed in the polls. The experts spoke to were the customer having the most elevated level of 51.1% of reasons for delay in development venture took after by the contractual workers having 35.5% then the specialists having minimal level of 13.3%. There are numerous variables that actuate delay on development ventures, however in this investigation the components are constrained to 15 factors causing deferral and they were positioned by the mean record score. The components incorporates: absence of assets to fund the undertaking to finish, changes in illustrations, absence of successful correspondence among the gatherings included , absence of satisfactory data from experts, moderate basic leadership and contract worker's indebtedness, varieties. Additionally, venture administration issue, slip-up and disparities in contract report, hardware accessibility and disappointment, botches amid development, awful climate, change in costs of building materials, unseemly general hierarchical structure connecting to the task and work strike.[22]

23.Johnston (1981) that work, he presented a graph by considering time on x-axis and locations on y-axis to represent the nature of activities in linear projects. The method was called as linear scheduling method (LSM) and his work suggested that the method could be used in transportation construction projects and other types of repetitive projects. A procedure for cost duration analysis was also illustrated with an example.[23]

24.T.Subramani, M.Sekar(2015) The Preplanning Project Management module is far reaching, multi-venture arranging and control programming, based on Oracle and Microsoft SQL Server social databases for big business wide undertaking administration scalability. The Project Management module empowers your association to store and deal with its activities in a focal area. The module bolsters work breakdown structures (WBS), hierarchical breakdown structures

(OBS), client characterized fields and codes, basic way strategy (CPM) planning, and asset leveling. Preplanning Project Management is required to Give finish Project Management Solution, Internationally Reputed, Having Flexibility to Manage Multiple Projects in Centralized area, Provides office to Integrate ERP or Accounting System. Project calendar can be computed one of two ways: when we pick the Scheduling charge or each time we roll out an improvement that influences plan dates. The Critical Path Method (CPM) booking system is utilized to figure extend plans. CPM utilizes movement spans and connections between exercises to ascertain the venture plan.[24]

25.Mattila and Park (2003) have compared the results of critical activities of basic linear scheduling elements determined with the help of the linear scheduling method and the repetitive scheduling method (RSM). Use of control points was proposed by them in the determination of critical paths with RSM whereas controlling links were used for the same purpose with LSM. The controlling paths for various types and relationship conditions of activities were studied both with LSM and CPM and found to be providing similar results for both methods.[25]

26.Handa and Barcia (1987) on linear scheduling using optimal control theory showed that a discrete optimal control framework was adequate for construction process. This new branch of optimisation presented by them made it possible to view the construction production process as a dynamic system that evolves over time. A hypothetical cut-and-fill job on a section of highway was presented by them by means of a continuous optimal control formulation.[26]

27.Khurana Sunita et al (2013) The present work depends on exact information of a piece of the Rolai-Rinjlai road development venture, in which crude material is accessible at various quarries giving diverse alternatives to the contract worker. Thinking about the venture as a system, we utilized CPM strategy trying to get the basic way of the system and recommended the best approach for getting material and development of road under the expressed imperatives. We utilized colliding with additionally diminish the undertaking fruition time. The arrangement recommended by us give a significantly shorter culmination time when contrasted with the genuine time taken by the venture. To this end, we utilize smashing to limit time financially, as well as to recognize feasible implies that were prior disregarded by the contract worker which brought about a calendar that required time and additionally cost not as much as that taken by for the underlying CPM arrangement.[27]

1.3 OBJECTIVES OF THE STUDY

1. To document the range of identified causes of delay in completing road construction projects.

2. To document the most important causes of delay in road construction projects.

3. To document identified differences in perception of contractors and consultants regarding causes of delay in delivering projects by the intended completion date.

4.The purpose of this paper is to identify and rank from contractors' point of view the factors that contribute to delay of road construction projects and to identify the effects of delays.

CHAPTER -2

2.1 METHODOLOGY

1. Activities were selected and their critical path was found out using the Critical Path Method.
2. The data is then fed into the Primavera software and delays were input as 15 days, 30 days, 60 days and 70 days.

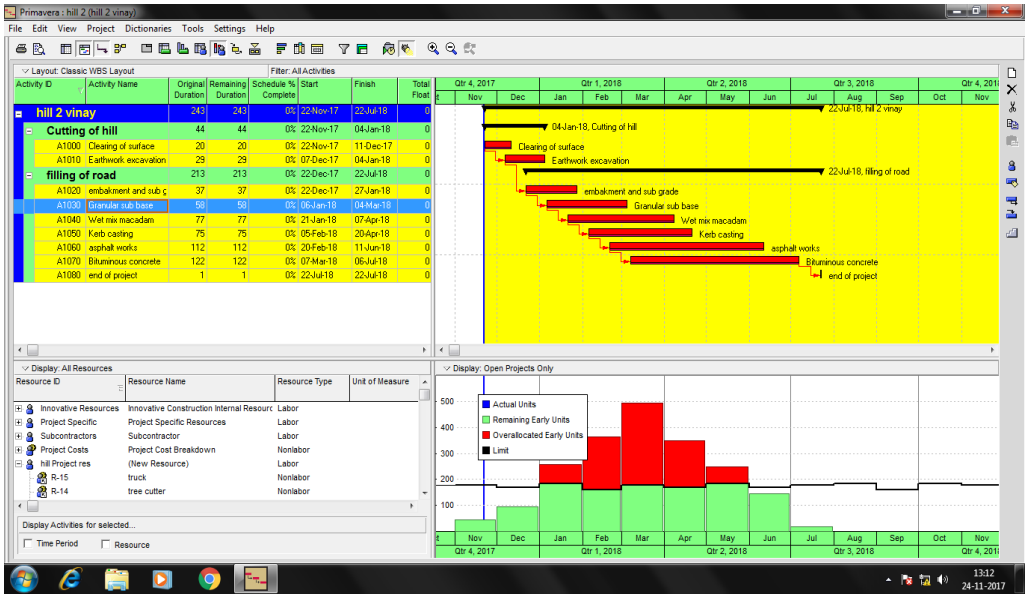


Fig.1-Primavera data for 15 days delay

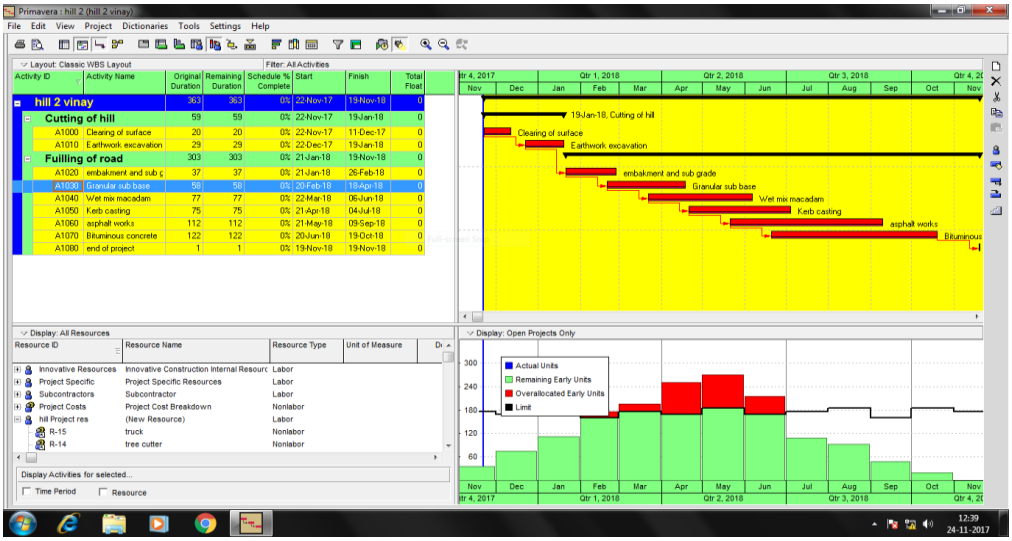


Fig.2-Primavera data for 30 days delay

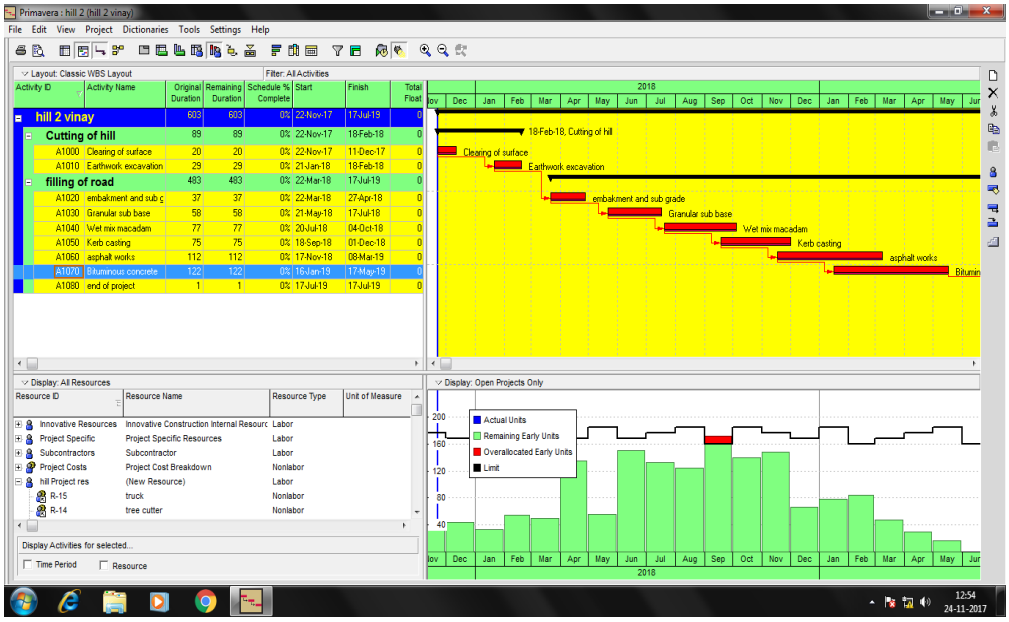


Fig.3-Primavera data for 60 days delay

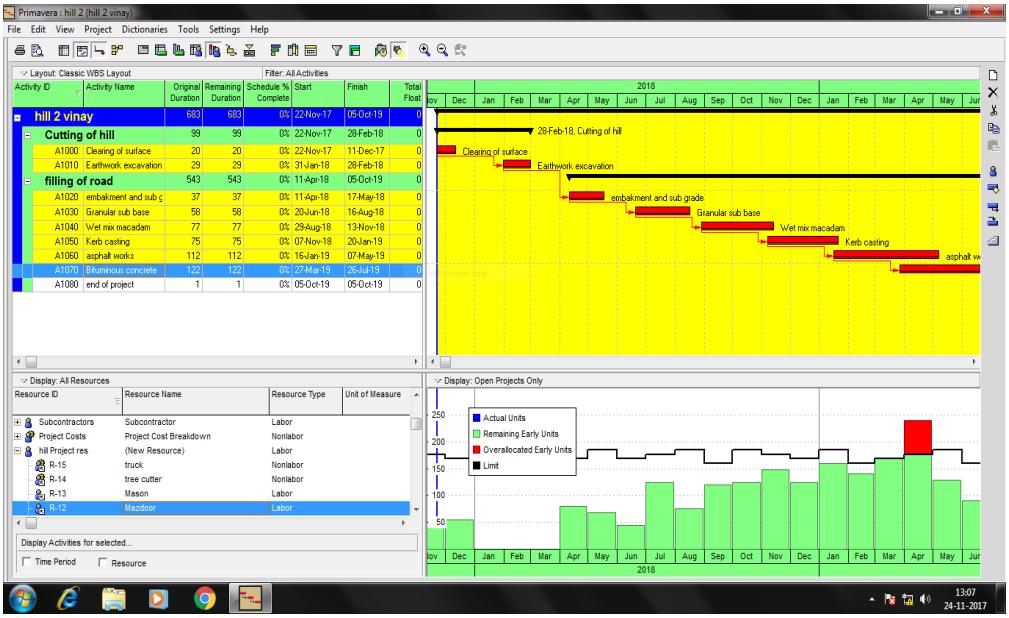


Fig.4-Primavera data for 70 days delay

3. The data is then input in MS Excel using random number generation with a predefined range selected arbitrarily and Monte Carlo simulation is carried out to calculate the mean, standard deviation and coefficient of variation

4. Then output is fed into the Primavera software and using Monte Carlo Simulation in MS Excel we calculate mean, standard deviation and coefficient of variation.
5. Then normal distribution is calculated and graphs are plotted. The peak of the graph shows the main delay factor.

2.3 SELECTION OF ROAD ALIGNMENT

1. Length.

2. Altitude of the road.

3. Saddles or pass.

4. Stability of hill slope.

5. Geological structure.

6. Tunnels.

7. Geometric standards.

8. Camping sites.

CHAPTER-3

3.1 DELAY

Hilly road ventures are finished of hazard and vulnerabilities. Hilly road Delay can have negative financial punishment and can make terrible reflection for the contract worker. As per delay isn't on time conveyance of hilly raod execution ventures. Postponement was characterized by invade of time far from arranged calendar. Hilly road Project postponements can bring about loss of benefits to customers and high working expense to contract workers due time augmentation. Hilly road venture hazard can be various and may turn out from various sources. They can be caused by customers, their specialists, contractual workers or providers. Customers are the originator of trivial postponements however non-understandable deferrals are cause by contract workers. Deferrals in uneven road can be term reasonable or non-forgivable relies upon the circumstance of an understanding. In hilly road venture Contractors have no control in delays. In augmentation of time, the contractual worker may likewise be allowed to recoup taken a toll identified with the postponement. Non-passable postponements are normal. They are occasions that the contract worker has control over. At that point characterize as a major aspect of postponements to the basic way that happen in the meantime. Sort of postponement can be shaped by either the customer or the contractual worker. Hillyroad venture the two gatherings assume liability for such deferral and can't recover remuneration.

3.2 DELAY FACTORS IN HILLY ROAD PROJECT

Material Shortage -

Deficiency of Material on location or dumping supply can builds the part of issues on uneven street ventures. Absence of supply can expanding a great deal of undertaking time for contractual workers which may at last defer the uneven street venture. Dependable supply of materials is essential to the accomplishment of each hilly street ventures. Faulty provider and late deliverance build material deficiencies on uneven street site. It can be prompt uneven street venture delay. A Good contacts alongside colleagues is the answer for uneven street venture achievement.

Customer Financial Problems-

The money related circumstance of a contract worker can be extremely terrible and affect contrarily on an uneven street venture. This issue of the contractual worker can be identity in customer related. Some contract workers in uneven streets have no cost control frameworks to trail their income. This again and again prompts inefficiency. Postponement in respecting installment by the customer makes immense money related troubles for the contractor. It is regular issue inhilly streets. However the contract workers monetary issue because of poor budgetary control and administration.

Work Availability and Shortage-

Each hilly street development venture needs some specialized experts, talented, semi-gifted and incompetent work. The requirement for such work is vital for the task of hilly street achievement. Be that as it may, it is hard to discovering the work aptitude. Absence of Labor is the fundamental factor of deferring in sloping street venture. A portion of the task area makes it hard to pull in some talented labor. Workers living in places where expectations for everyday comforts are low .

Plant and Equipment Shortage

These days uneven street development tasks are winding up extremely complex step by step henceforth the requirement for robotization of exercises nearby. Shameful utilization of plant can back off advance and make delay nearby. In the present development of the sloping streets owning a plant and gear is preference. Be that as it may, it isn't everybody who has the solace of

owning one. Buying uneven street gear is capital escalated. The utilization of plant or gear supports advance. As per sloping street development gear and plants for rental or procuring are expanding interest of contract workers.

Site Control and Management

Keeping up a sloping street site needs a great deal of coordination from all cooperation. At that point the required zone can be impeding to extend achievement. This issue the vast majority of the contract workers require the required involvement and administrative expertise to deal with the task group. Ineffectively oversaw site influences the execution .factor to postpone venture plot contribute by the inadequately site management Poor site administration has been sketched out as a contributing component to extend delay.

3.3AFFECT PROJECT PROGRESS

-Large scale and high quality requirement.

-International involvement.

-Traditional procurement approach.

-Large amount of small contractor.

-Over commitment of construction firms.

-International workforces.

-Lack of skilled labour and high professionals.

-Wrong time estimation.

-Language barrier.

-Communication with the client.

-Local regulations and customs

3.4 DATA ANALYSIS

-Prepare list of all activities involved in hilly road construction.

-Prepare a CPM network in primavera.

- Add delays as per data.

Sample Road Project (km 1.00 to km 3.00)

TABLE-1

Activity ID	Activity Description	Start Date	Completion Date	Duration start	Duration End
A	Clearing and Grubbing	22-11-17	11-12-17	0	20
B	Earthwork Excavation	4-12-17	1-1-18	12	29
C	Embankment and Subgrade	8-12-17	13-1-18	16	37
D	Granular Subbase	29-12-17	24-2-18	37	58
E	Wet Mix Macadam	2-1-18	19-3-18	41	72
F	Kerb Casting	23-1-18	7-4-18	62	75
G	Asphalt Works	23-2-18	14-5-18	91	112

H	Bituminous Concrete	5-3-18	4-6-18	101	122

3.5CPM NETWORK IN PRIMAVERA

Original data

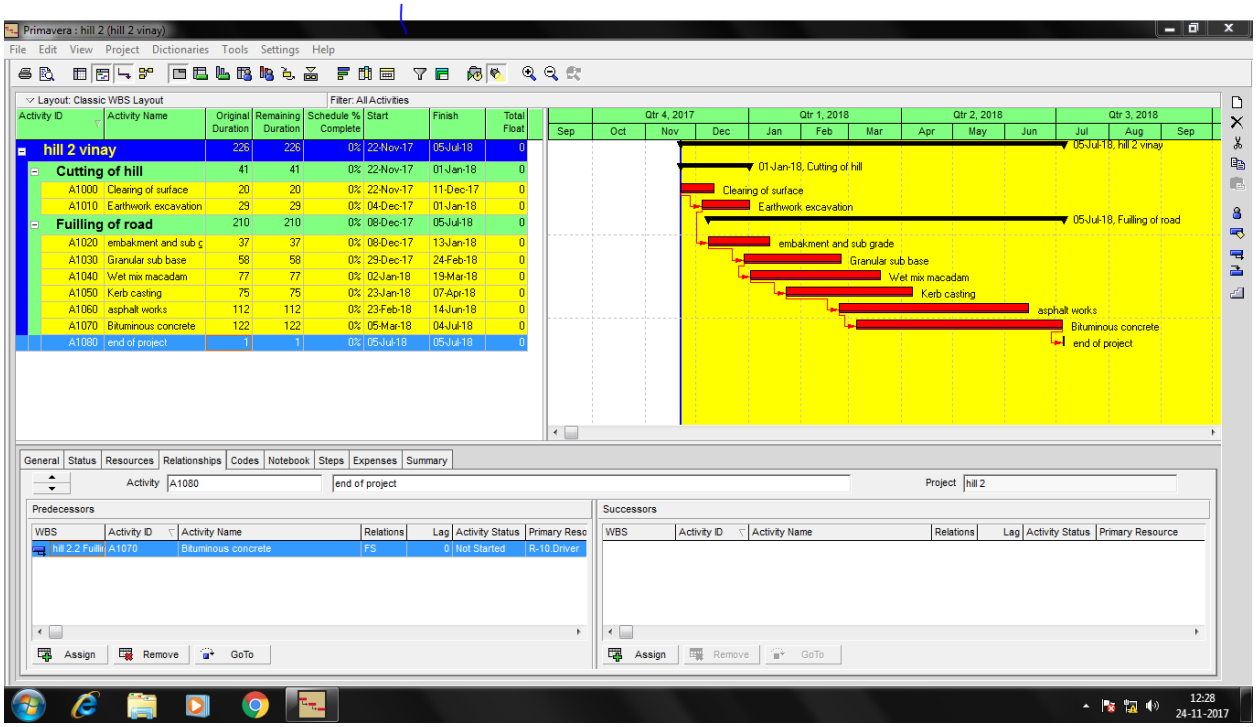


Fig.5- Original duration of the project

3.6 MONTE- CARLO SUMULATION BY USING MS.EXCELL.

MODEL-1

TABLE-2

ACTIVITY ID	ACTIVITY DESCRIPTION	PROBABILITY	MEAN DURATION	COEFF. OF VARIAT-ION (%)	STAND-ARD DEVIAT-ION	ROUNDED OFF S.D	RANGE
A	CLEARING & GRUBBING	GAUSSIAN	20	30	6	6	14-26
B	EARTH WORK-EXCAVATION	GAUSSIAN	29	25	7.25	7	22-36
C	EMBANK-MENT &SUBGRADE	GAUSSIAN	37	20	7.4	7	30-44
D	GRANNULAR SUBBASE	GAUSSIAN	58	20	11.6	12	46-70
E	WET MIX MACADOM	GAUSSIAN	77	15	11.55	12	65-89
F	KERB CASTING	GAUSSIAN	75	15	11.25	11	64-86
G	ASPHALT WORKS	GAUSSIAN	112	10	11.2	11	101-123
H	BITUMINOUS CONCRETE	GAUSSIAN	122	10	12.2	12	110-134
I	END	GAUSSIAN	0	0	0	0	0

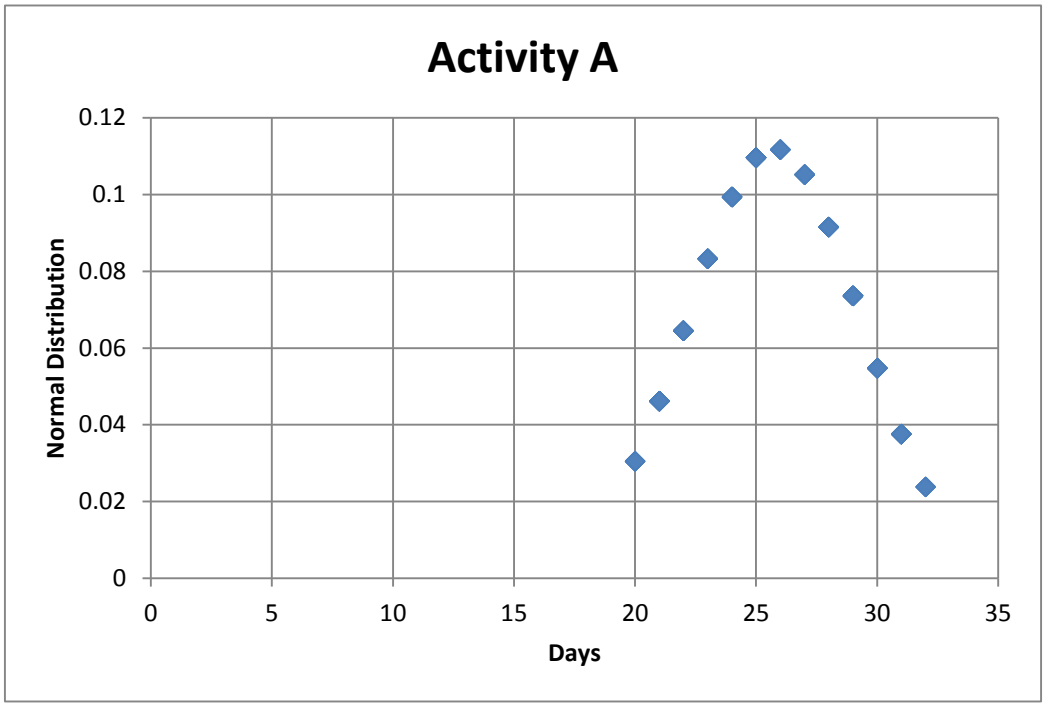
Mean	25.74	36.06	43.76	69.49	89.11	86.76	121.77	134.78	
S.D	3.560785	4.37121	4.374213	7.422999	7.446638	6.634955	6.530202	7.524479	
CoV	**13.83366**	**12.12205**	**9.995916**	**10.68211**	**8.356681**	**7.647481**	**5.362734**	**5.582786**	%

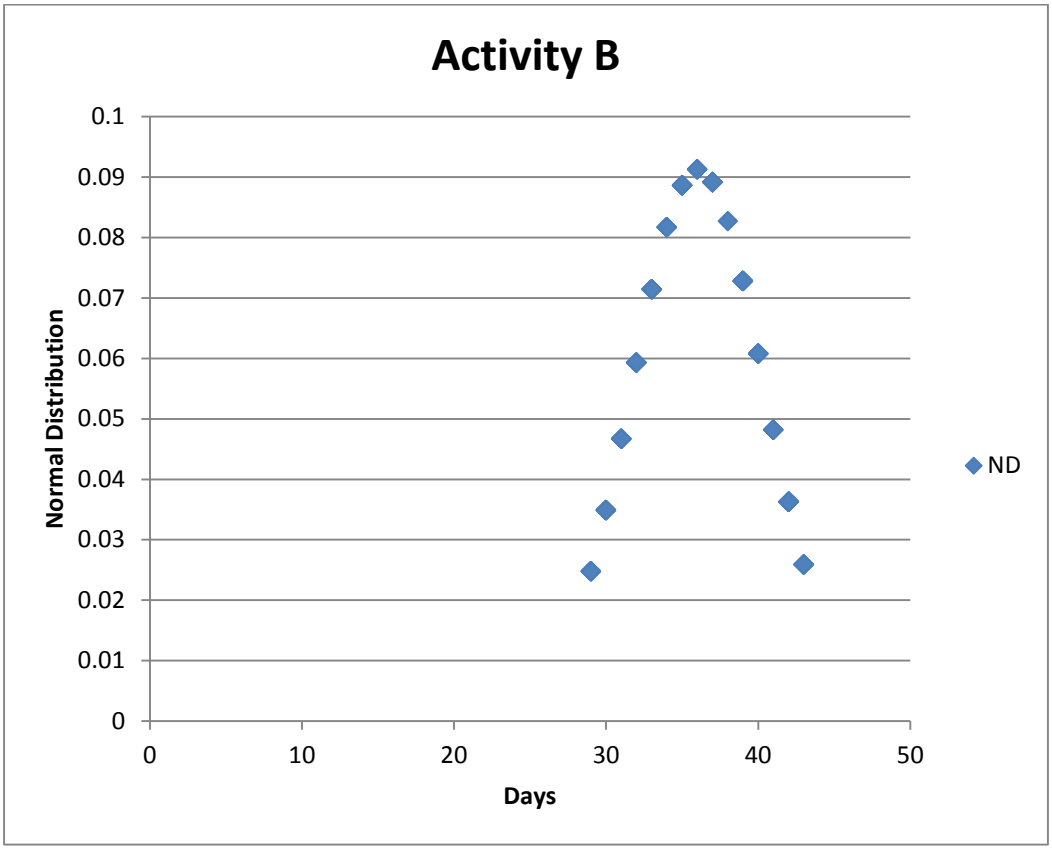
Input- Appendix 1

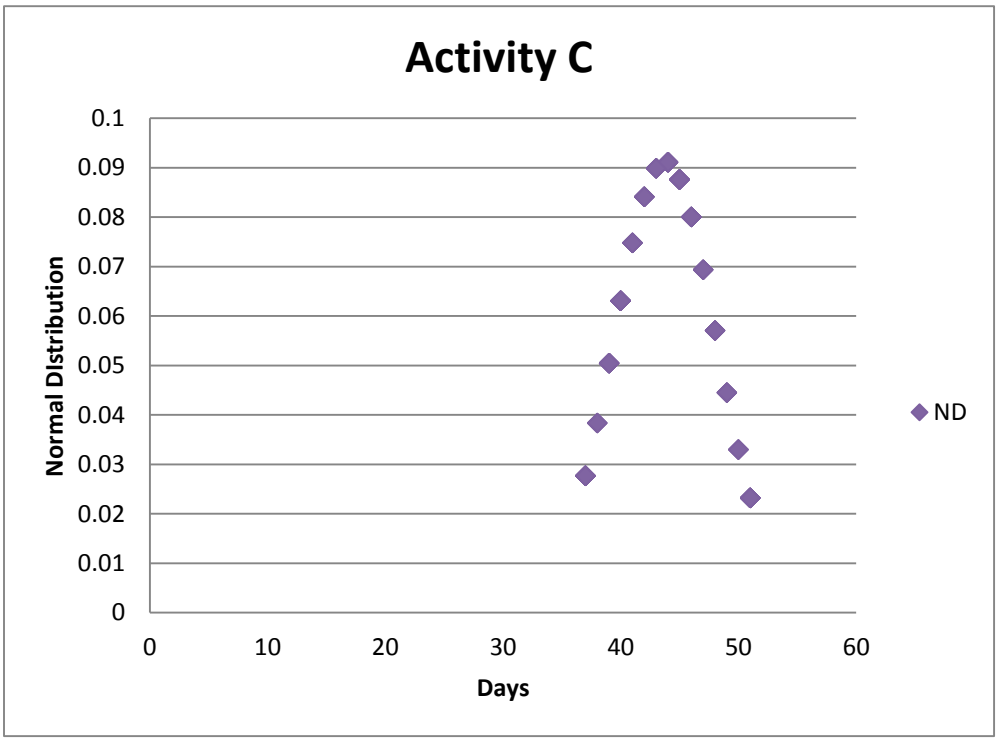
Output- Appendix 1.1

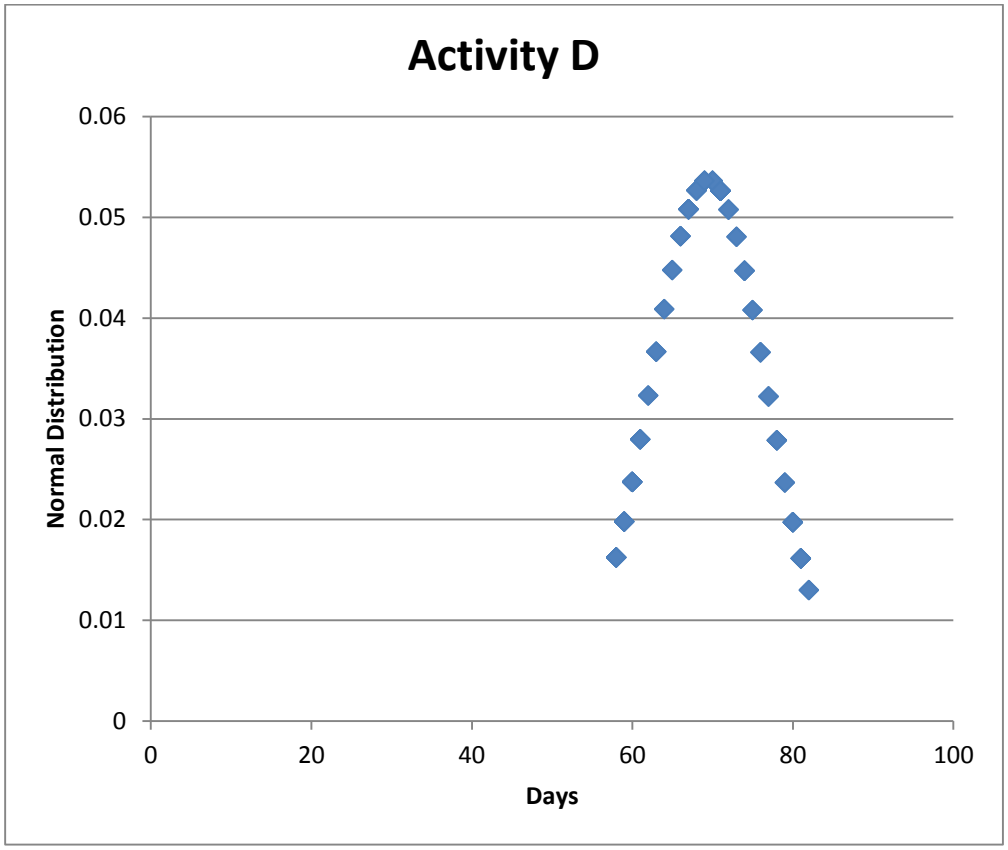
Normal Distribution Graphs:

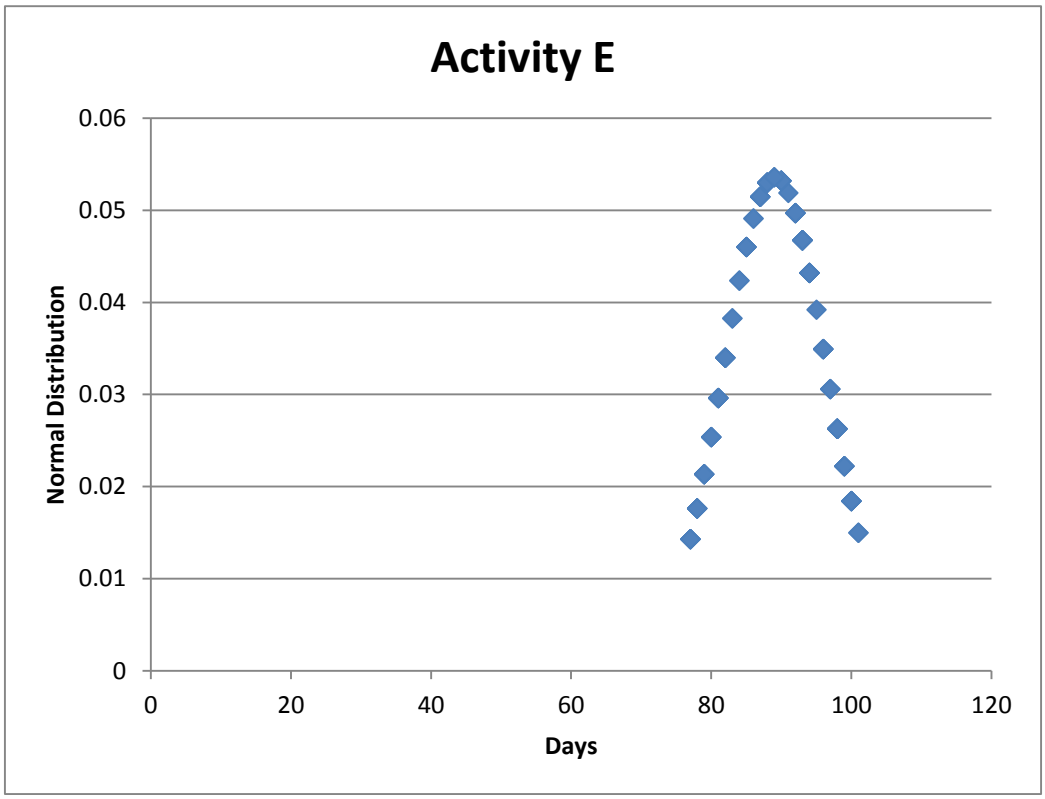
Input- Appendix 1.2

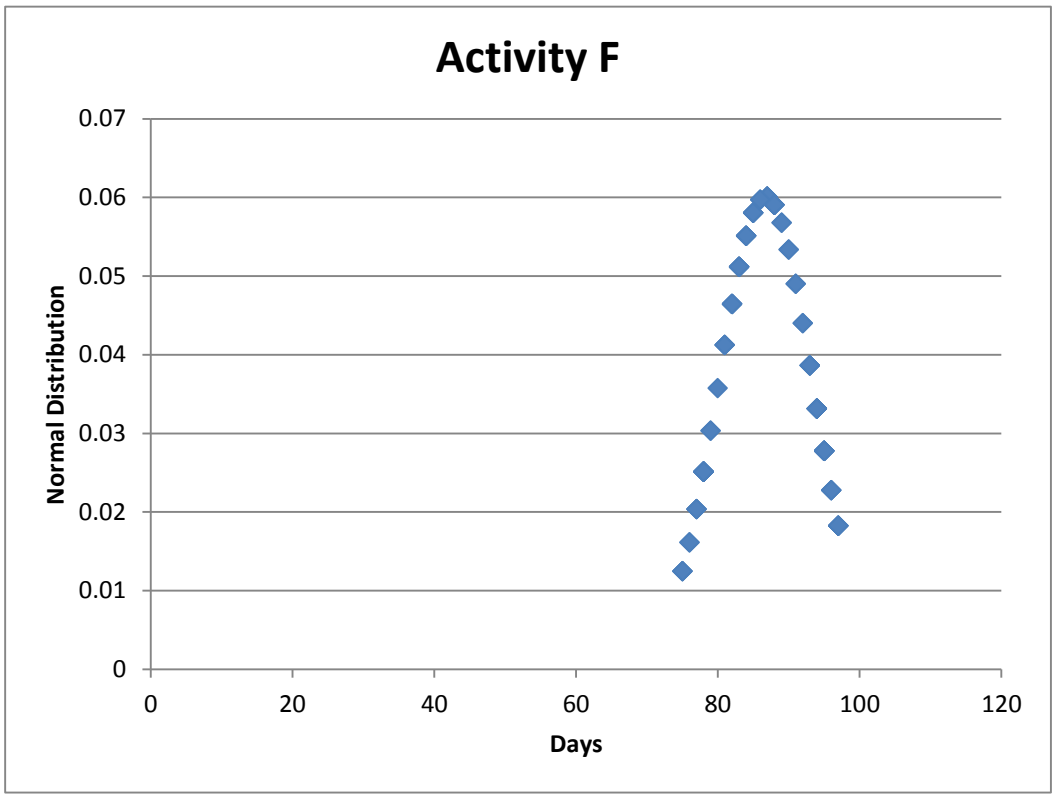


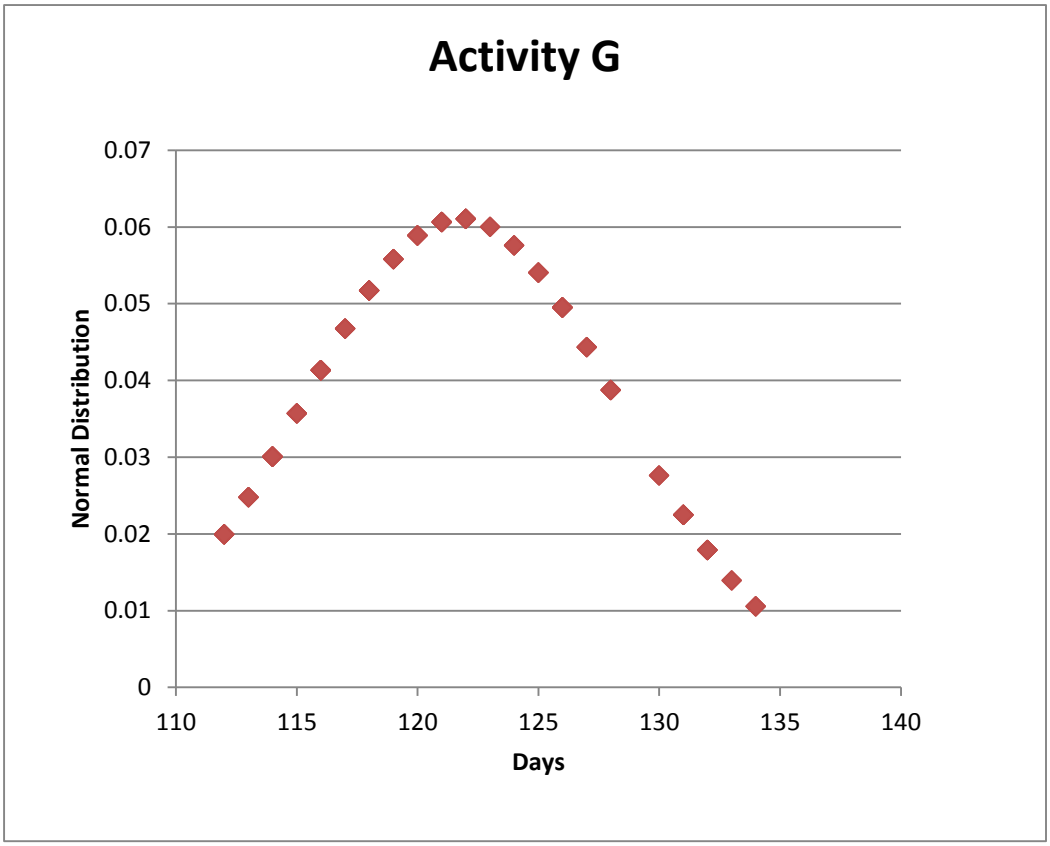

Activity B
Normal Distribution
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
10
20
30
40
50
Days
ND

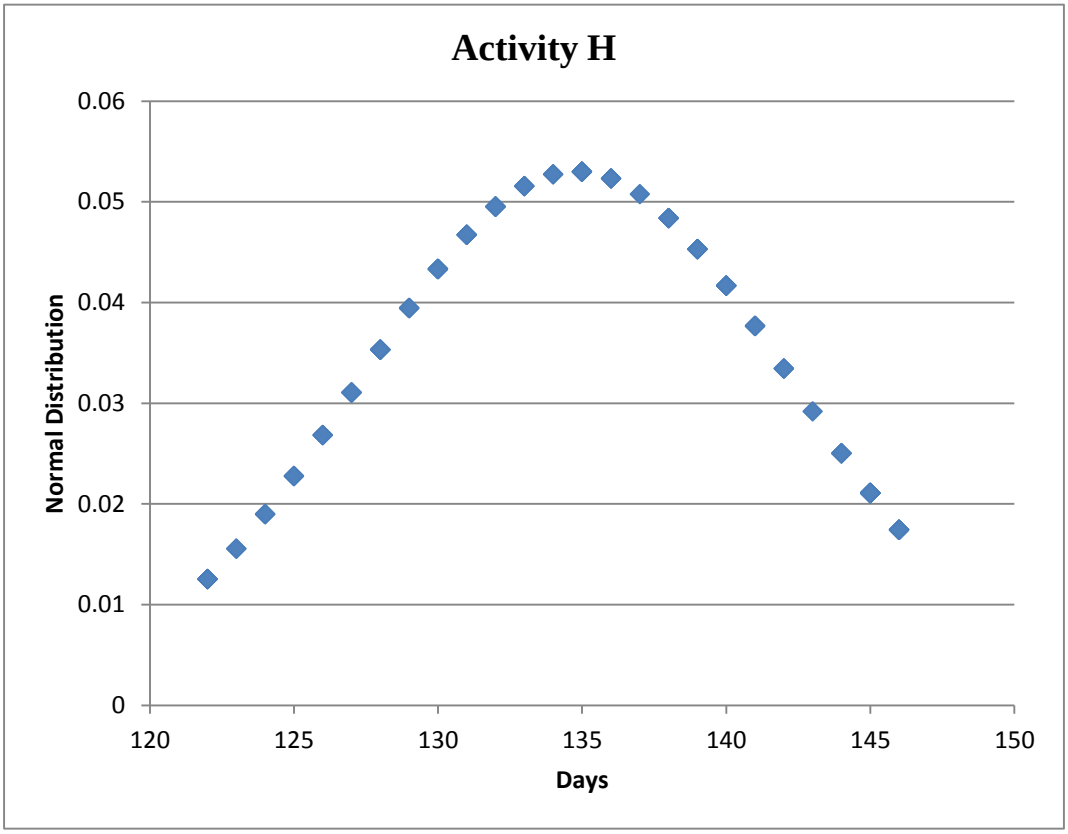

Activity C
Normal Distribution
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
10
20
30
40
50
60
Days
ND


Activity D
Normal Distribution
0.06
0.05
0.04
0.03
0.02
0.01
0
0
20
40
60
80
100
Days


Activity E
Normal Distribution
0.06
0.05
0.04
0.03
0.02
0.01
0
0
20
40
60
80
100
120
Days


Activity F
Normal Distribution
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
20
40
60
80
100
120
Days


Activity G
Normal Distribution
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
110
115
120
125
130
135
140
Days


Activity H
0.06
0.05
0.04
0.03
0.02
0.01
0
Normal Distribution
120
125
130
135
140
145
150
Days

MODEL-2

TABLE-3

ACTIVITY ID	ACTIVITY DESCRIPTION	PROBABILITY	MEAN DURATION	COEFF. OF VARIAT-ION (%)	STAND-ARD DEVIAT-ION	ROUNDED OFF S.D	RANGE
A	CLEARING & GRUBBING	GAUSSIAN	20	30	6	6	14-26
B	EARTH WORK-EXCAVATION	GAUSSIAN	29	0	0	0	0
C	EMBANK-MENT &SUBGRADE	GAUSSIAN	37	0	0	0	0
D	GRANNULAR SUBBASE	GAUSSIAN	58	0	0	0	0
E	WET MIX MACADOM	GAUSSIAN	77	0	0	0	0
F	KERB CASTING	GAUSSIAN	75	0	0	0	0
G	ASPHALT WORKS	GAUSSIAN	112	0	0	0	0
H	BITUMINOUS CONCRETE	GAUSSIAN	122	0	0	0	0
I	END	GAUSSIAN	0	0	0	0	0

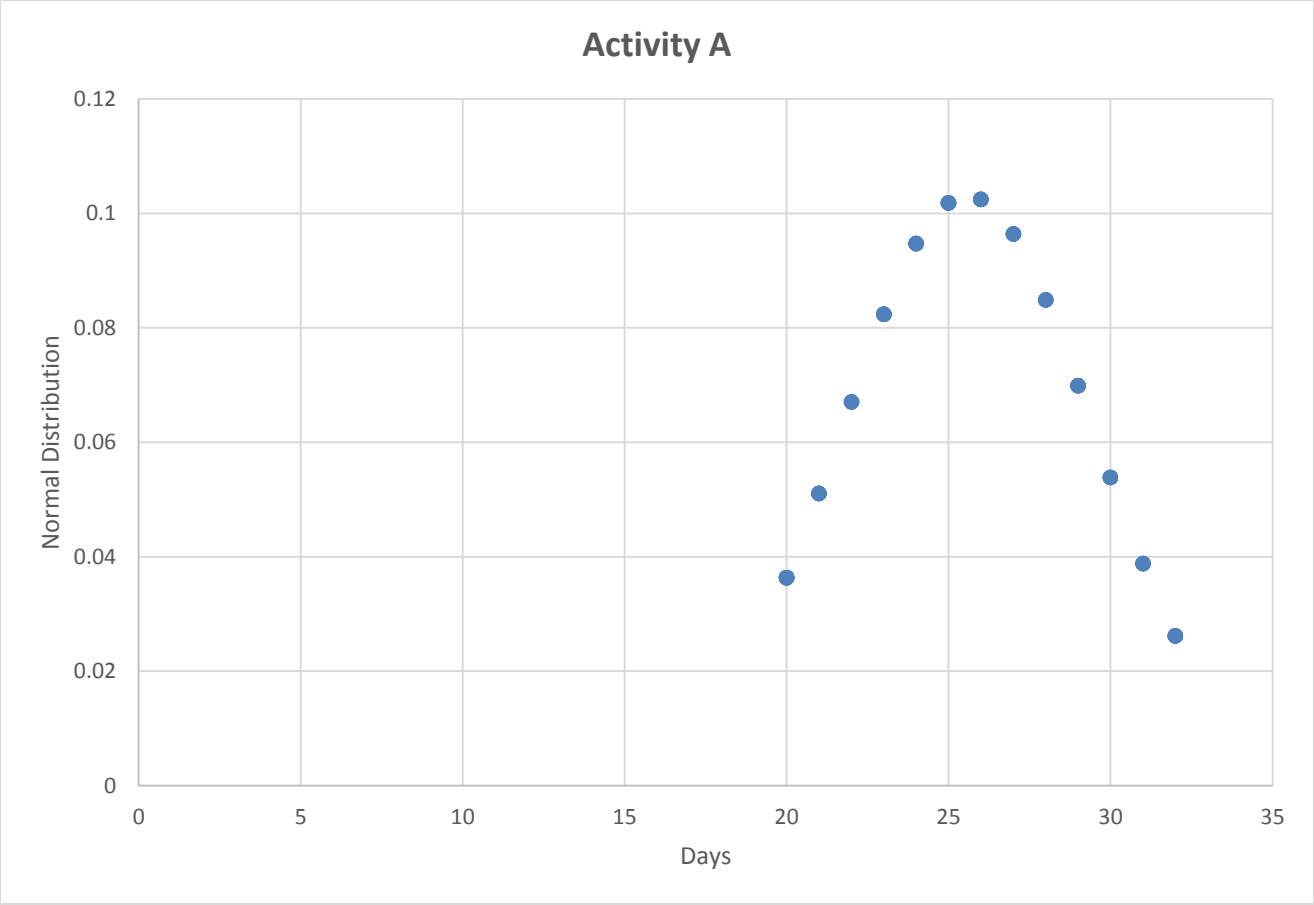
Mean	25.59
S.D	3.871927
Cov	15.13062

Input- Appendix 2

Output- Appendix 2.1

Normal Distribution Graph:

Input-Appendix 2.2



MODEL-3

TABLE-4

ACTIVITY ID	ACTIVITY DESCRIPTION	PROBABILITY	MEAN DURATION	COEFF. OF VARIAT-ION (%)	STAND-ARD DEVIAT-ION	ROUNDED OFF S.D	RANGE
A	CLEARING & GRUBBING	GAUSSIAN	20	0	0	0	0
B	EARTH WORK-EXCAVATION	GAUSSIAN	29	25	7.25	7	22-36
C	EMBANK-MENT &SUBGRADE	GAUSSIAN	0	0	0	0	0
D	GRANNULAR SUBBASE	GAUSSIAN	0	0	0	0	0
E	WET MIX MACADOM	GAUSSIAN	0	0	0	0	0
F	KERB CASTING	GAUSSIAN	0	0	0	0	0
G	ASPHALT WORKS	GAUSSIAN	0	0	0	0	0
H	BITUMINOUS CONCRETE	GAUSSIAN	0	0	0	0	0
I	END	GAUSSIAN	0	0	0	0	0

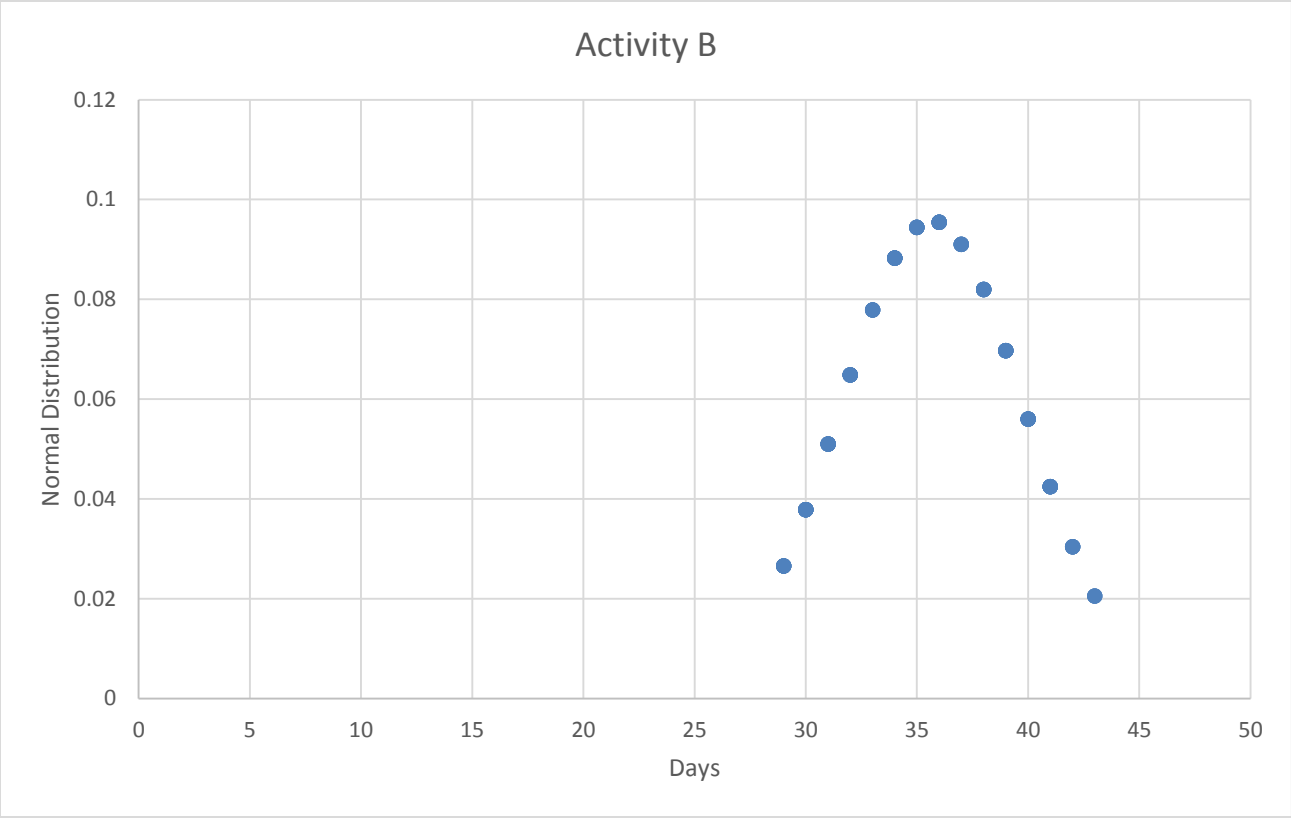
Mean	35.68
S.D	4.170314
CoV	11.6881

Input- Appendix 3

Output- Appendix 3.1

Normal Distribution Graph:

Input- Appendix 3.2



MODEL-4

TABLE-5

ACTIVITY ID	ACTIVITY DESCRIPTION	PROBABILITY	MEAN DURATION	COEFF. OF VARIAT-ION (%)	STAND-ARD DEVIAT-ION	ROUNDED OFF S.D	RANGE
A	CLEARING & GRUBBING	GAUSSIAN	20	0	0	0	0
B	EARTH WORK-EXCAVATION	GAUSSIAN	29	0	0	0	0
C	EMBANK-MENT &SUBGRADE	GAUSSIAN	37	20	7.4	7	30-44
D	GRANNULAR SUBBASE	GAUSSIAN	58	0	0	0	0
E	WET MIX MACADOM	GAUSSIAN	77	0	0	0	0
F	KERB CASTING	GAUSSIAN	75	0	0	0	0
G	ASPHALT WORKS	GAUSSIAN	112	0	0	0	0
H	BITUMINOUS CONCRETE	GAUSSIAN	122	0	0	0	0
I	END	GAUSSIAN	0	0	0	0	0

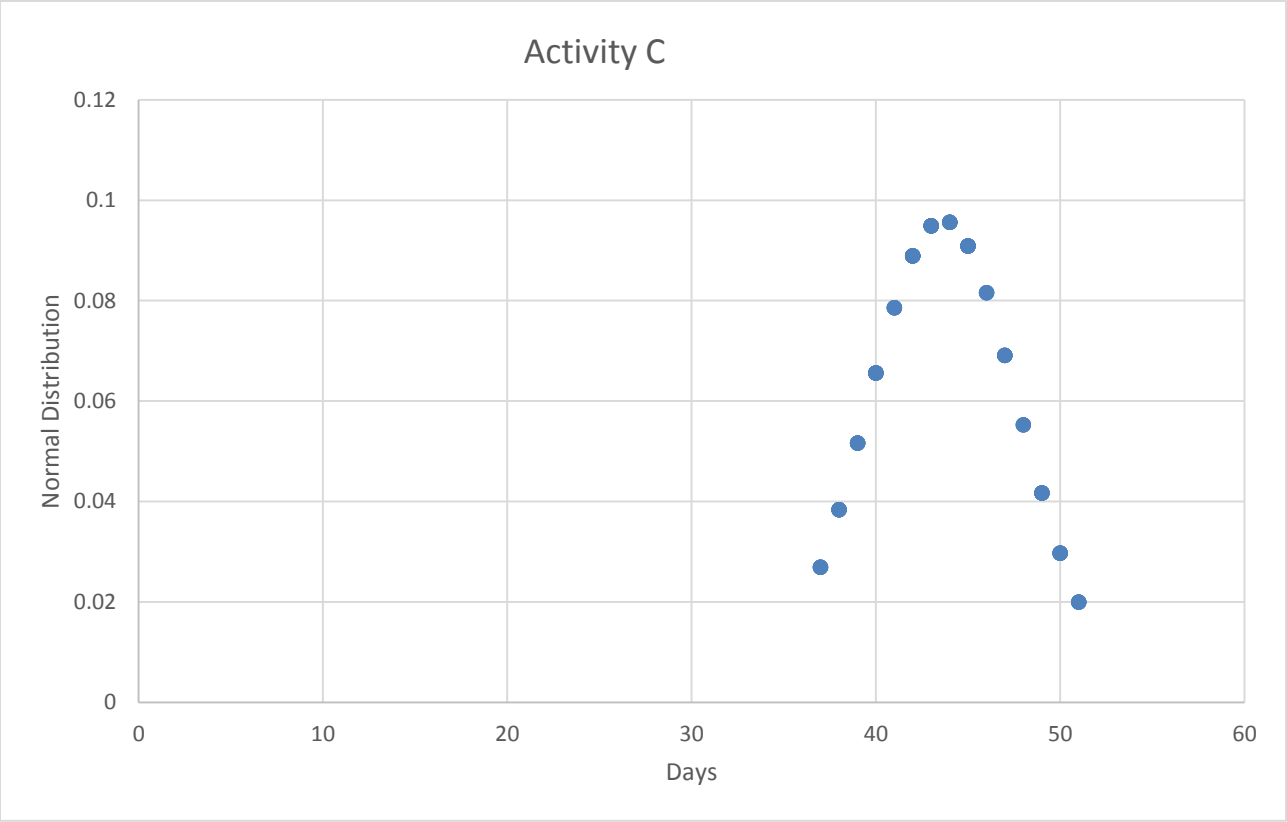
Mean	43.63
S.D	4.157639
CoV	9.529312

Input- Appendix 4

Output- Appendix 4.1

Normal Distribution Graph:

Input- Appendix 4.2



MODEL-5

TABLE-6

ACTIVITY ID	ACTIVITY DESCRIPTION	PROBABILITY	MEAN DURATION	COEFF. OF VARIAT-ION (%)	STAND-ARD DEVIAT-ION	ROUNDED OFF S.D	RANGE
A	CLEARING & GRUBBING	GAUSSIAN	20	0	0	0	0
B	EARTH WORK-EXCAVATION	GAUSSIAN	29	0	0		0
C	EMBANK-MENT &SUBGRADE	GAUSSIAN	37	0	0		0
D	GRANNULAR SUBBASE	GAUSSIAN	58	20	11.6	12	46-70
E	WET MIX MACADOM	GAUSSIAN	77	0	0	0	0
F	KERB CASTING	GAUSSIAN	75	0	0	0	0
G	ASPHALT WORKS	GAUSSIAN	112	0	0	0	0
H	BITUMINOUS CONCRETE	GAUSSIAN	122	0	0	0	0
I	END	GAUSSIAN	0	0	0	0	0

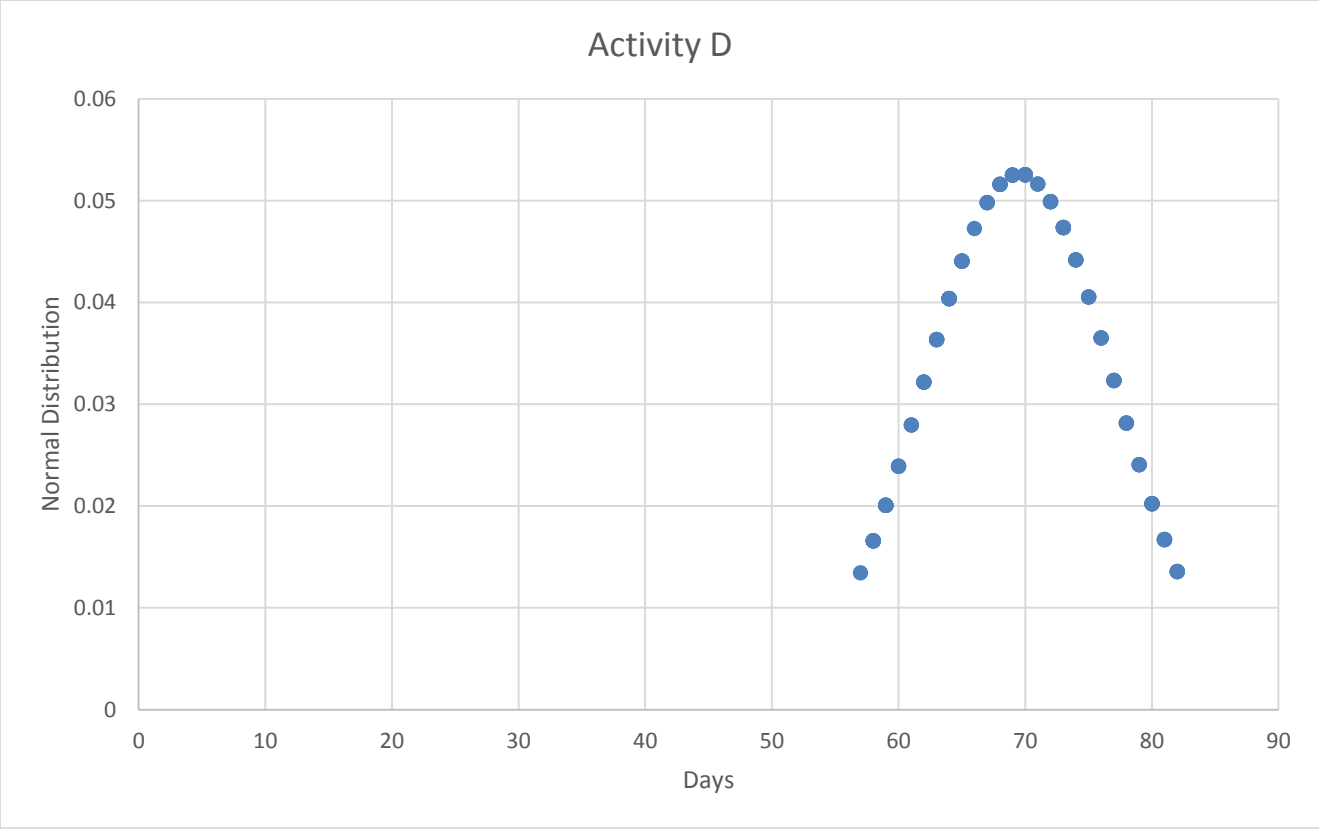
Mean	69.52
S.D	7.577852
CoV	10.90025

Input- Appendix 5

Output- Appendix 5.1

Normal Distribution Graph:

Input- Appendix 5.2



MODEL-6

TABLE-7

ACTIVITY ID	ACTIVITY DESCRIPTION	PROBABILITY	MEAN DURATION	COEFF. OF VARIAT-ION (%)	STAND-ARD DEVIAT-ION	ROUNDED OFF S.D	RANGE
A	CLEARING & GRUBBING	GAUSSIAN	20	0	0	0	0
B	EARTH WORK-EXCAVATION	GAUSSIAN	29	0	0	0	0
C	EMBANK-MENT &SUBGRADE	GAUSSIAN	37	0	0	0	0
D	GRANNULAR SUBBASE	GAUSSIAN	58	0	0	0	0
E	WET MIX MACADOM	GAUSSIAN	77	15	11.55	12	65-89
F	KERB CASTING	GAUSSIAN	75	0	0	0	0
G	ASPHALT WORKS	GAUSSIAN	112	0	0	0	0
H	BITUMINOUS CONCRETE	GAUSSIAN	122	0	0	0	0
I	END	GAUSSIAN	0	0	0	0	0

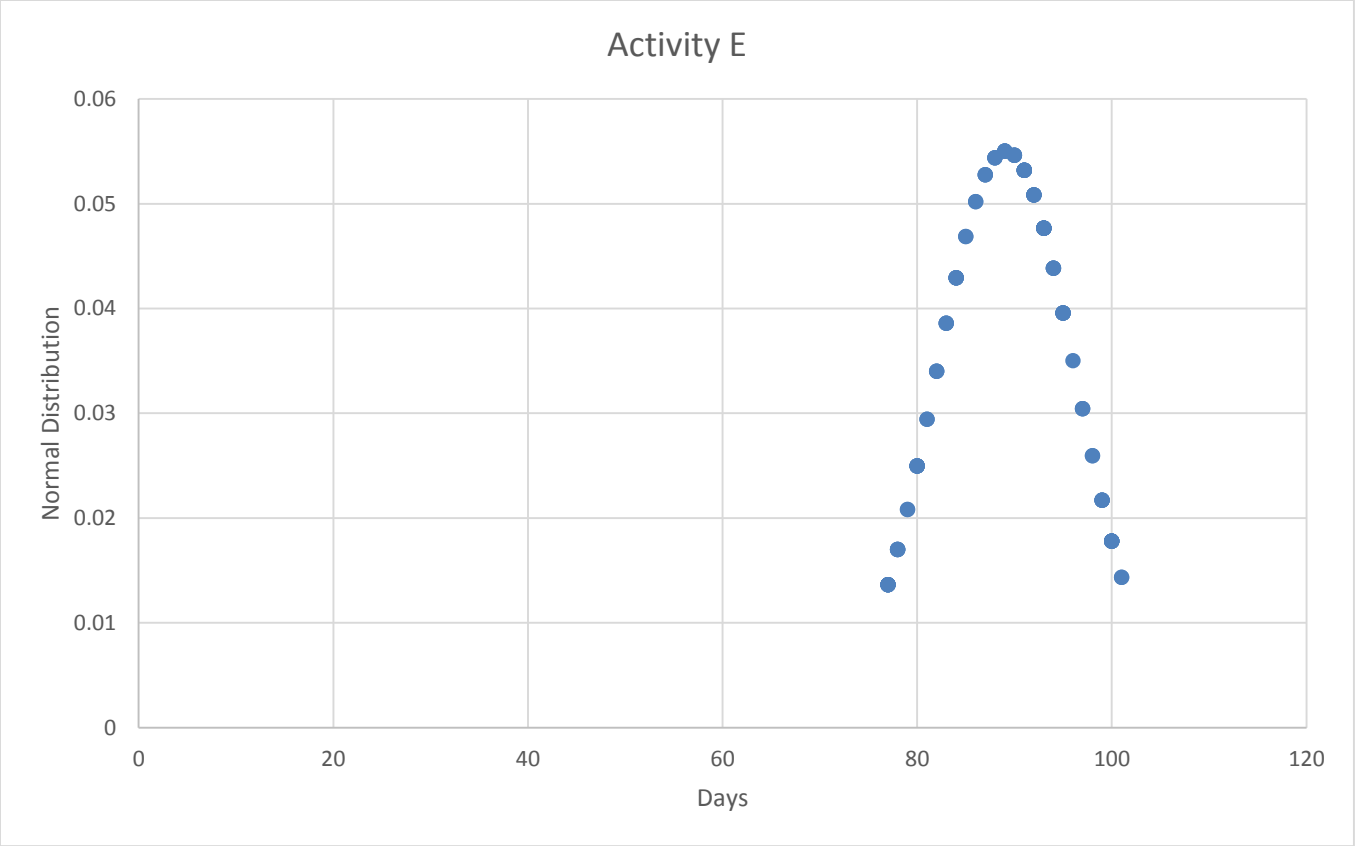
Mean	89.11
S.D	7.248678
CoV	8.134528

Input- Appendix 6

Output- Appendix 6.1

Normal Distribution Graph:

Input- Appendix 6.2



MODEL-7

TABLE-8

ACTIVITY ID	ACTIVITY DESCRIPTION	PROBABILITY	MEAN DURATION	COEFF. OF VARIAT-ION (%)	STAND-ARD DEVIAT-ION	ROUNDED OFF S.D	RANGE
A	CLEARING & GRUBBING	GAUSSIAN	20	0	0	0	0
B	EARTH WORK-EXCAVATION	GAUSSIAN	29	0	0	0	0
C	EMBANK-MENT &SUBGRADE	GAUSSIAN	37	0	0	0	0
D	GRANNULAR SUBBASE	GAUSSIAN	58	0	0	0	0
E	WET MIX MACADOM	GAUSSIAN	77	0	0	0	0
F	KERB CASTING	GAUSSIAN	75	15	11.25	11	64-86
G	ASPHALT WORKS	GAUSSIAN	112	0	0	0	0
H	BITUMINOUS CONCRETE	GAUSSIAN	122	0	0	0	0
I	END	GAUSSIAN	0	0	0	0	0

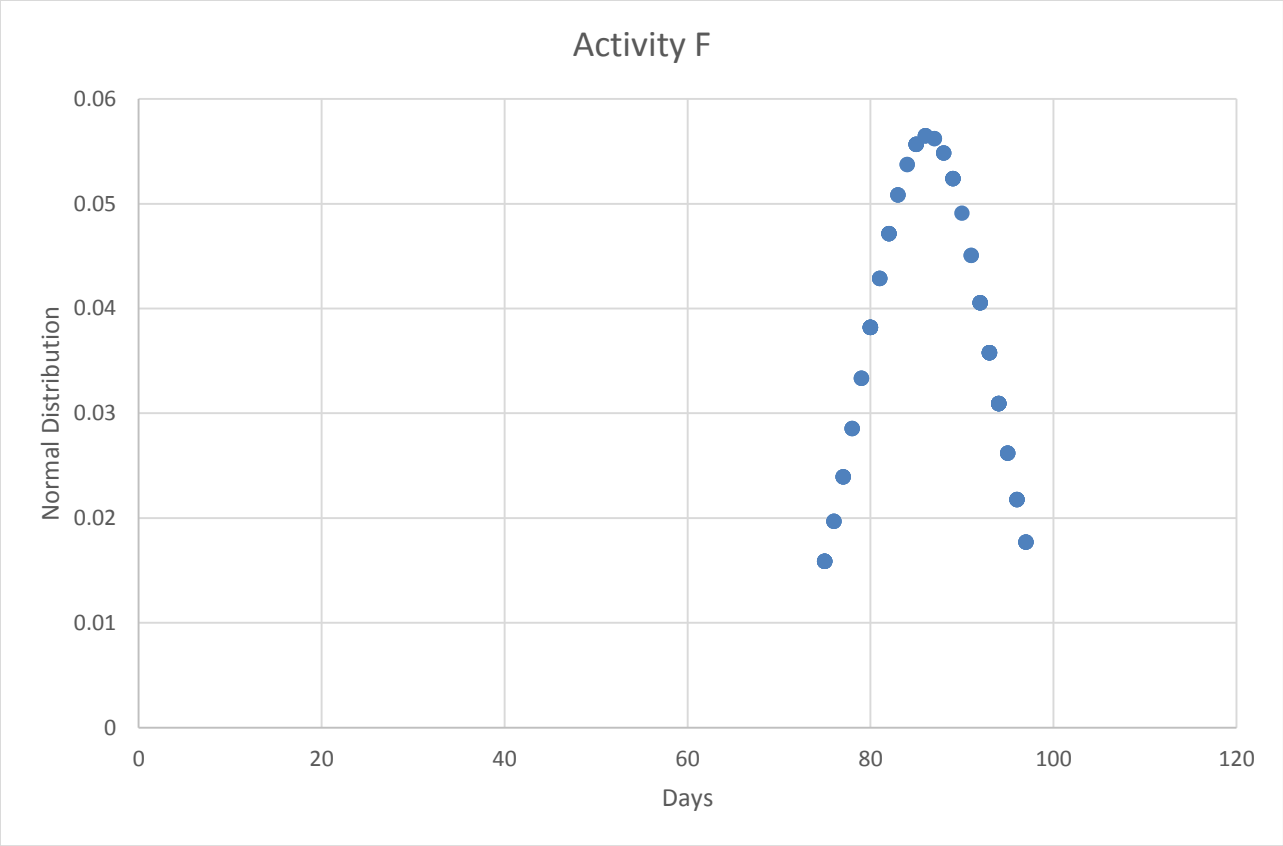
Mean	86.25
S.D	7.055874
CoV	8.180723

Input- Appendix 7

Output- Appendix 7.1

Normal Distribution Graph:

Input- Appendix 7.2



MODEL-8

TABLE-9

ACTIVITY ID	ACTIVITY DESCRIPTION	PROBABILITY	MEAN DURATION	COEFF. OF VARIAT-ION (%)	STAND-ARD DEVIAT-ION	ROUNDED OFF S.D	RANGE
A	CLEARING & GRUBBING	GAUSSIAN	20	0	0	0	0
B	EARTH WORK-EXCAVATION	GAUSSIAN	29	0	0	0	0
C	EMBANK-MENT &SUBGRADE	GAUSSIAN	37	0	0	0	0
D	GRANNULAR SUBBASE	GAUSSIAN	58	0	0	0	0
E	WET MIX MACADOM	GAUSSIAN	77	0	0	0	0
F	KERB CASTING	GAUSSIAN	75	0	0	0	0
G	ASPHALT WORKS	GAUSSIAN	112	10	11.2	11	101-123
H	BITUMINOUS CONCRETE	GAUSSIAN	122	0	0	0	0
I	END	GAUSSIAN	0	0	0	0	0

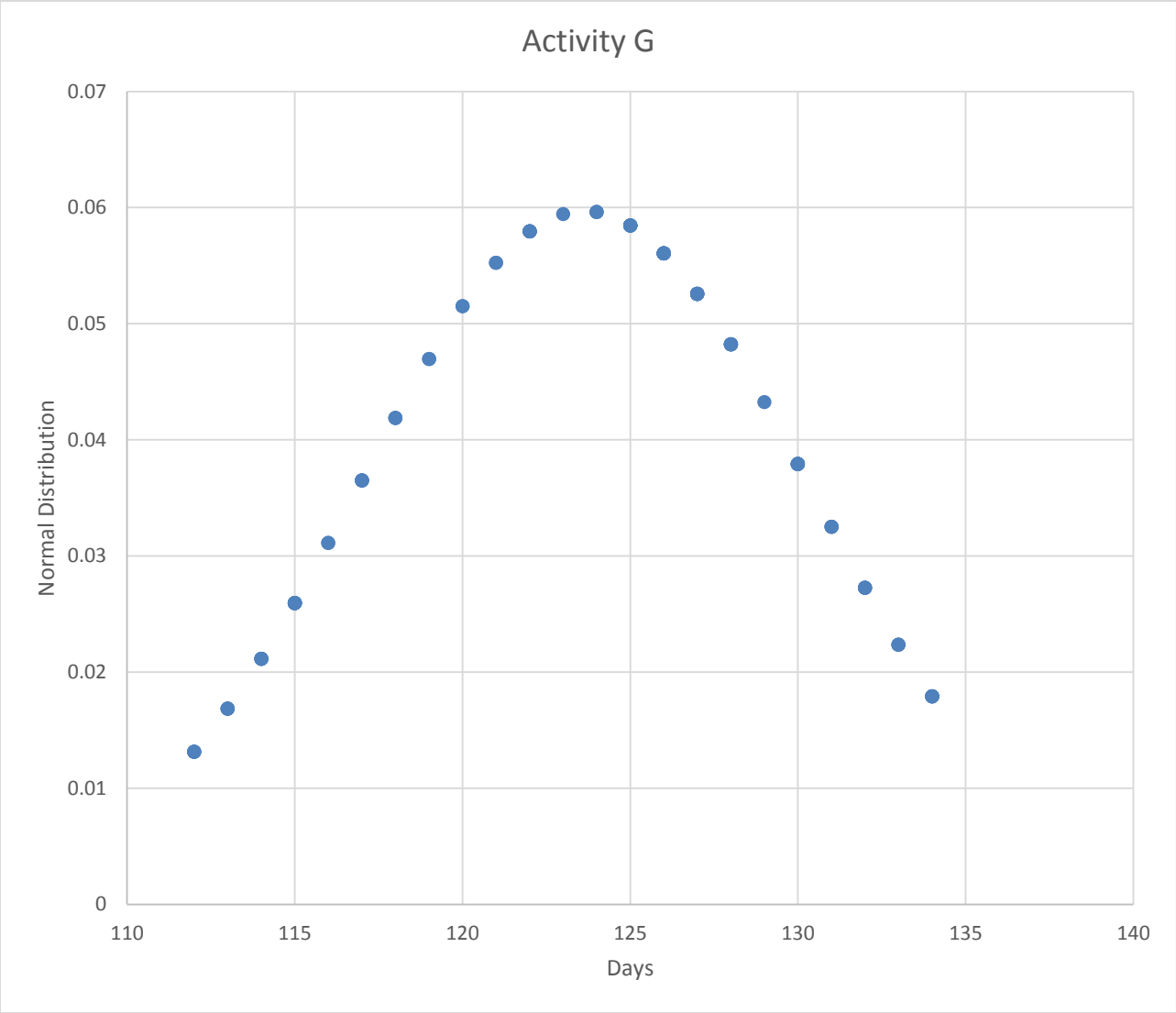
Mean	123.63
S.D	6.682791
CoV	5.405477

Input- Appendix 8

Output- Appendix 8.1

Normal Distribution Graph:

Input- Appendix 8.2



MODEL-9

TABLE-10

ACTIVITY ID	ACTIVITY DESCRIPTION	PROBABILITY	MEAN DURATION	COEFF. OF VARIAT-ION (%)	STAND-ARD DEVIAT-ION	ROUNDED OFF S.D	RANGE
A	CLEARING & GRUBBING	GAUSSIAN	20	0	0	0	0
B	EARTH WORK-EXCAVATION	GAUSSIAN	29	0	0	0	0
C	EMBANK-MENT &SUBGRADE	GAUSSIAN	37	0	0	0	0
D	GRANNULAR SUBBASE	GAUSSIAN	58	0	0	0	0
E	WET MIX MACADOM	GAUSSIAN	77	0	0	0	0
F	KERB CASTING	GAUSSIAN	75	0	0	0	0
G	ASPHALT WORKS	GAUSSIAN	112	0	0	0	0
H	BITUMINOUS CONCRETE	GAUSSIAN	122	10	12.2	12	110-134
I	END	GAUSSIAN	0	0	0	0	0

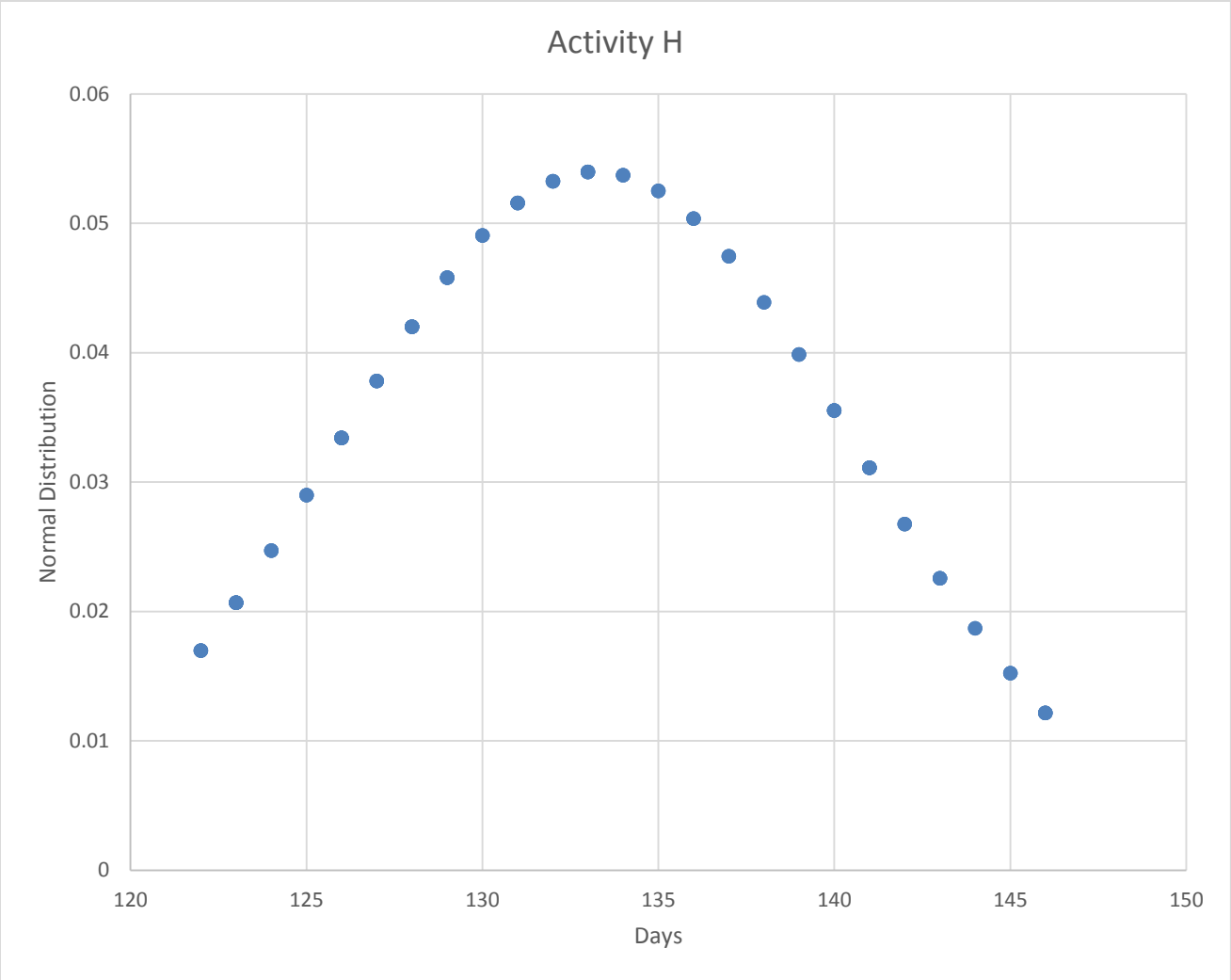
Mean	133.24
S.D	7.388388
CoV	5.545173

Input- Appendix 9

Output- Appendix 9.1

Normal Distribution Graph:

Input- Appendix 9.2



MODEL-10

TABLE-11

ACTIVITY ID	ACTIVITY DESCRIPTION	PROBABILITY	MEAN DURATION	COEFF. OF VARIAT-ION (%)	STAND-ARD DEVIAT-ION	ROUNDED OFF S.D	RANGE
A	CLEARING & GRUBBING	GAUSSIAN	20	30	6	6	14-26
B	EARTH WORK-EXCAVATION	GAUSSIAN	29	30	8.7	9	20-38
C	EMBANK-MENT &SUBGRADE	GAUSSIAN	37	30	11.1	11	26-48
D	GRANNULAR SUBBASE	GAUSSIAN	58	30	17.4	17	41-75
E	WET MIX MACADOM	GAUSSIAN	77	30	23.1	23	54-100
F	KERB CASTING	GAUSSIAN	75	30	22.5	23	52-98
G	ASPHALT WORKS	GAUSSIAN	112	30	33.6	34	78-146
H	BITUMINOUS CONCRETE	GAUSSIAN	122	30	36.6	37	85-159
I	END	GAUSSIAN	0	0	0	0	0

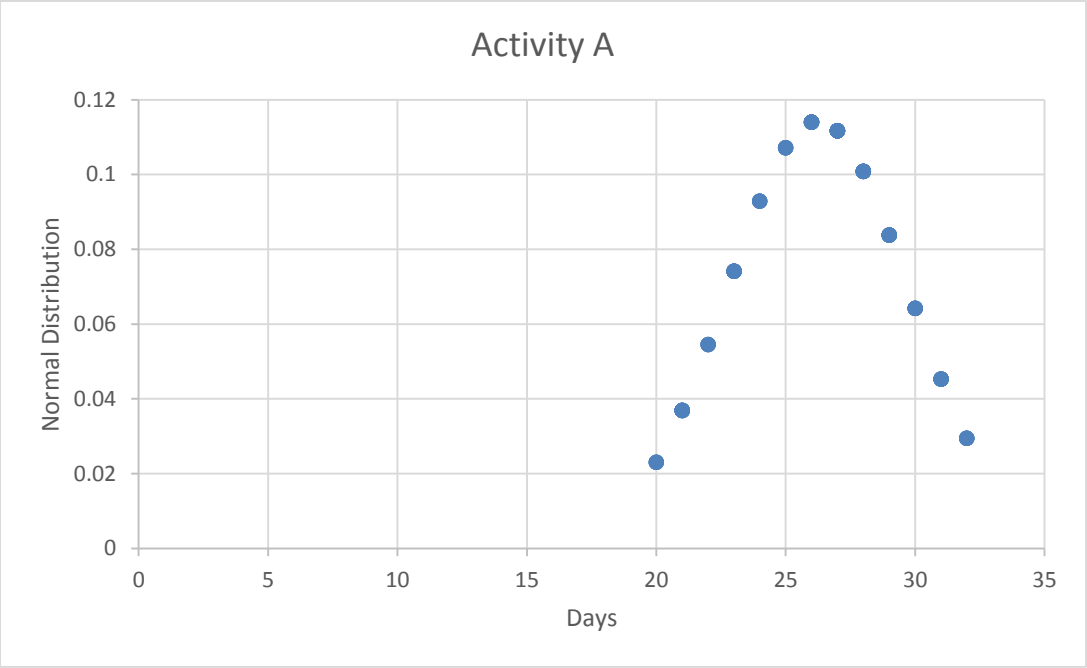
Mean	26.25	38.38	49.02	75.47	100.31	97.59	145.46	162.34	
S.D	3.491331	5.292991	6.276427	10.49815	13.74273	14.3844	20.09946	20.88846	
CoV	13.30031	13.79101	12.80381	13.91037	13.70026	14.73963	13.81786	12.8671	%

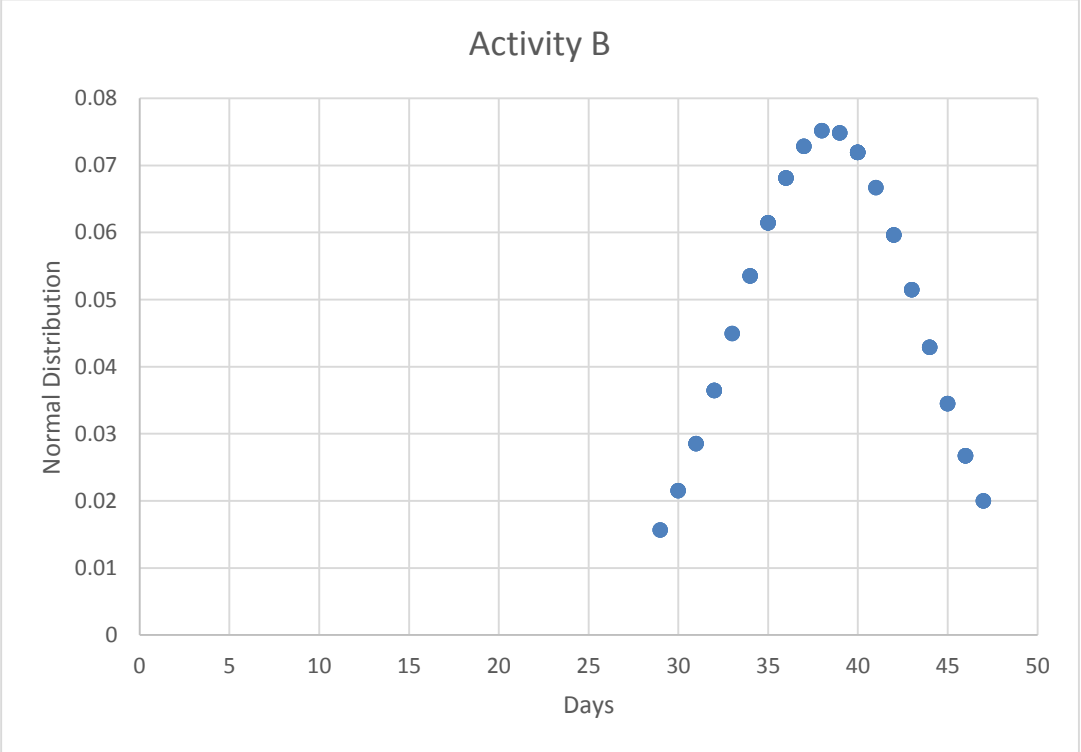
Input- Appendix 10

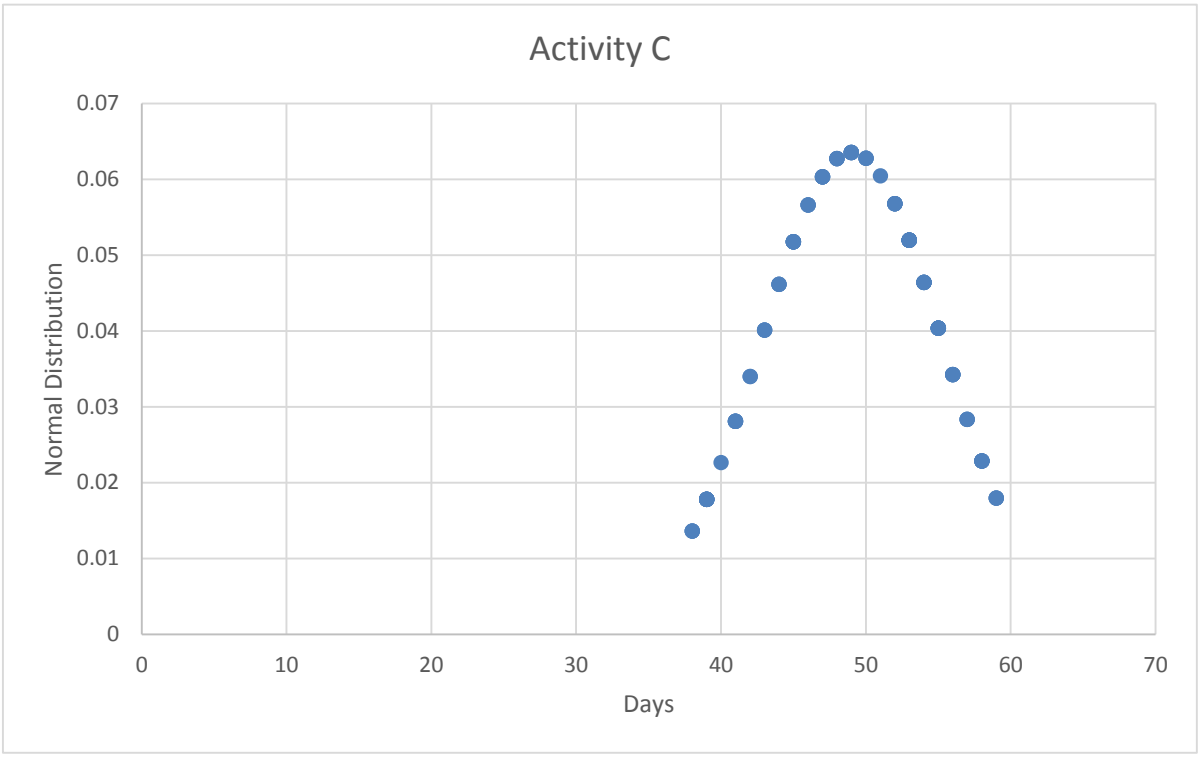
Output- Appendix 10.1

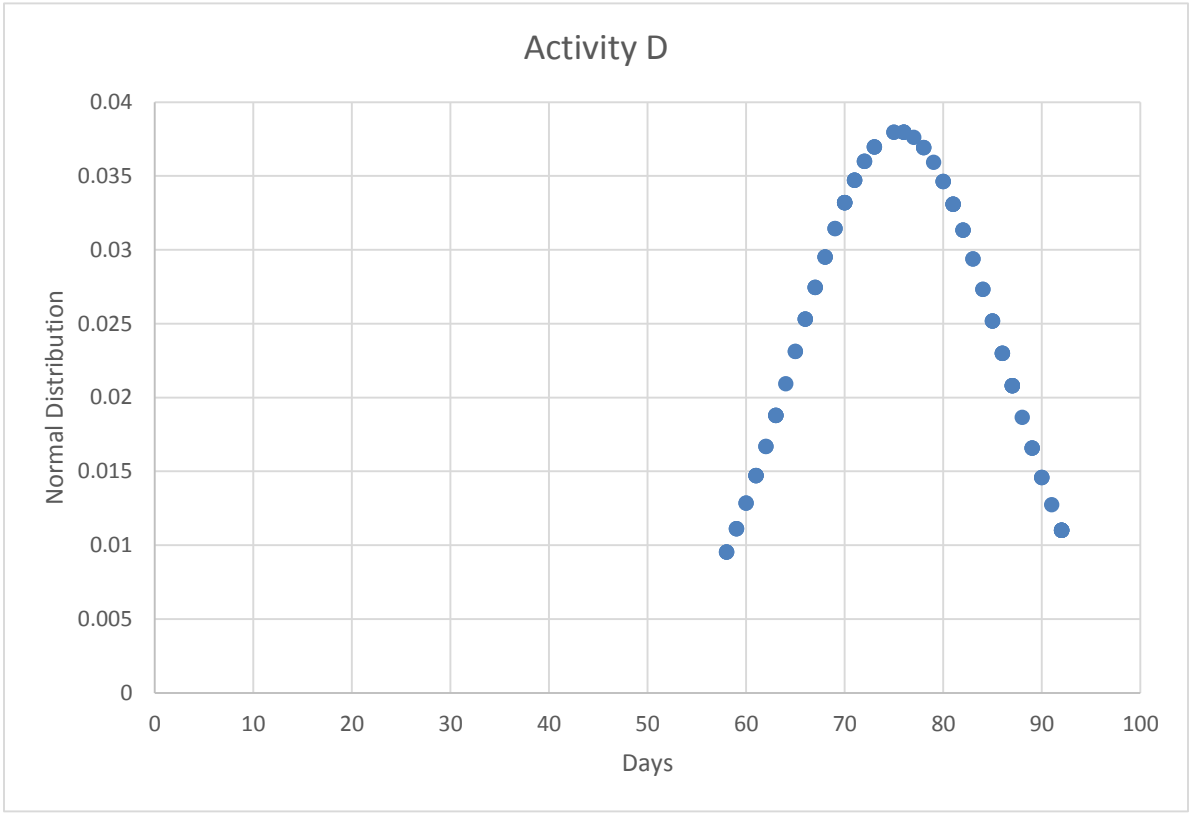
Normal Distribution Graphs:

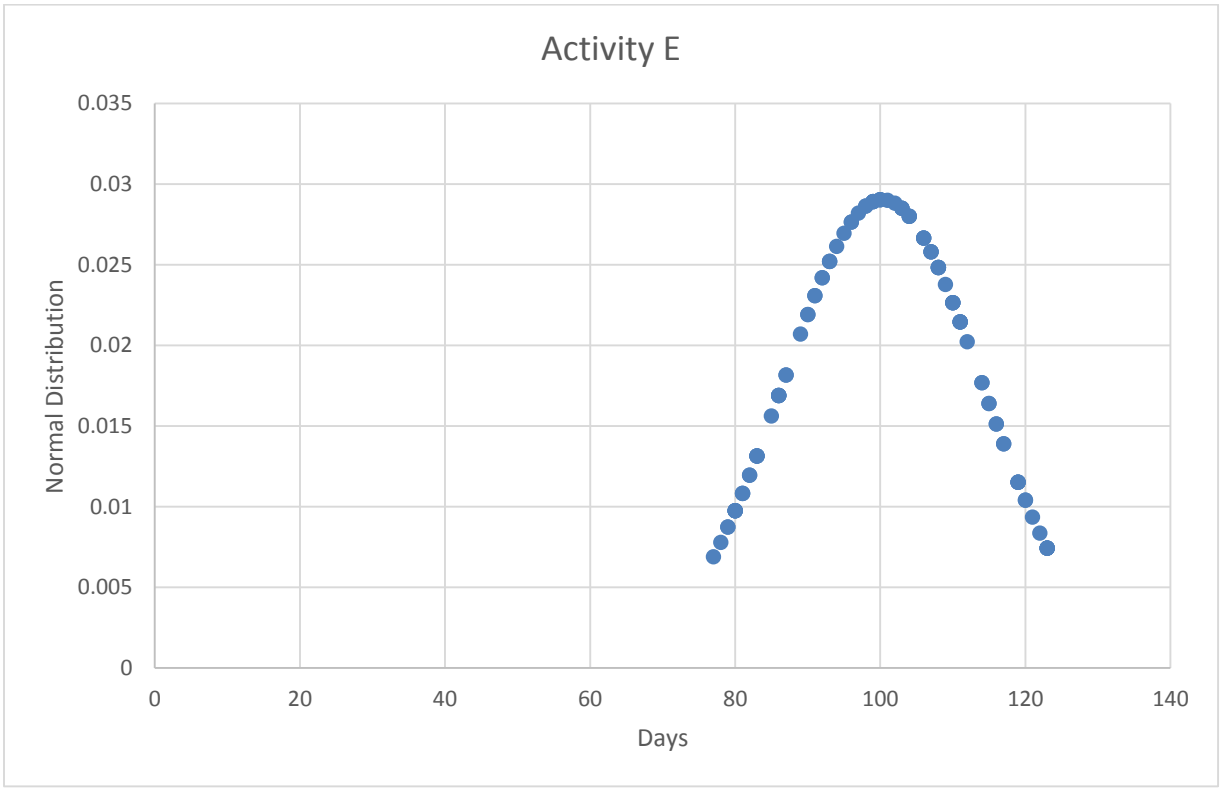
Input- Appendix 10.2

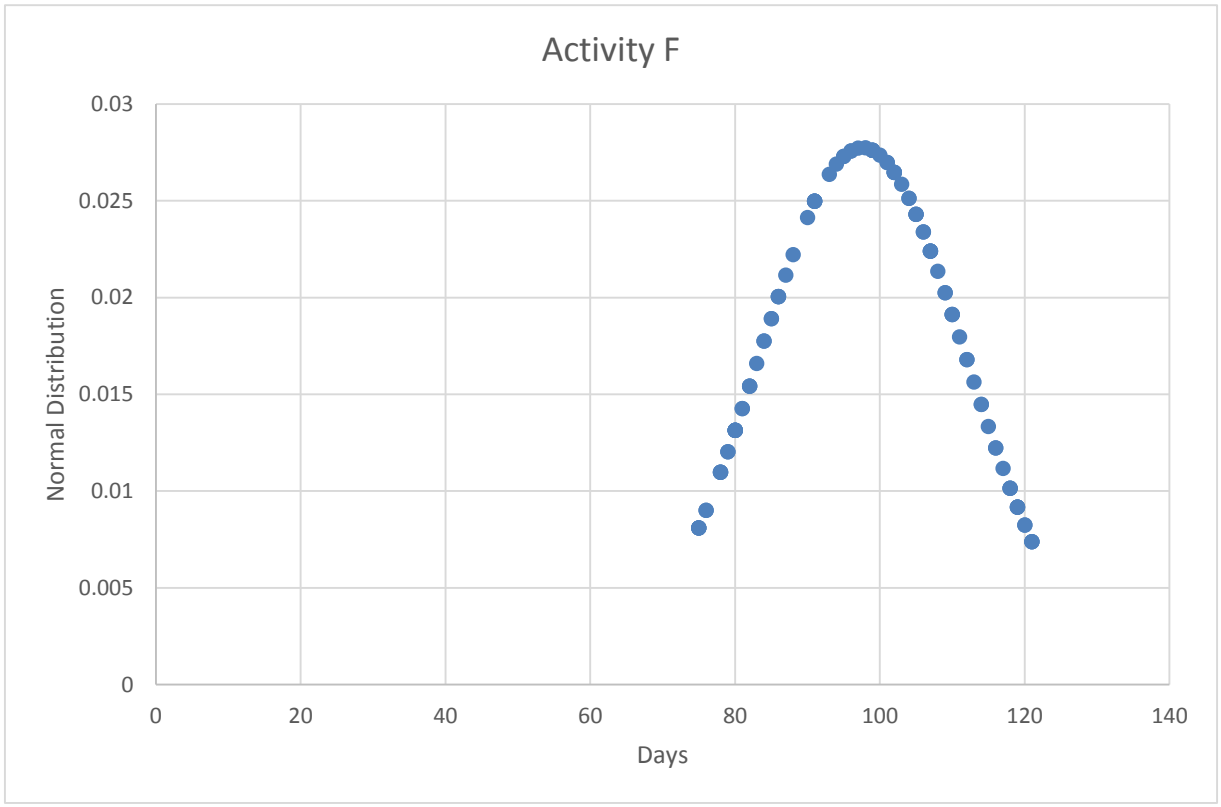


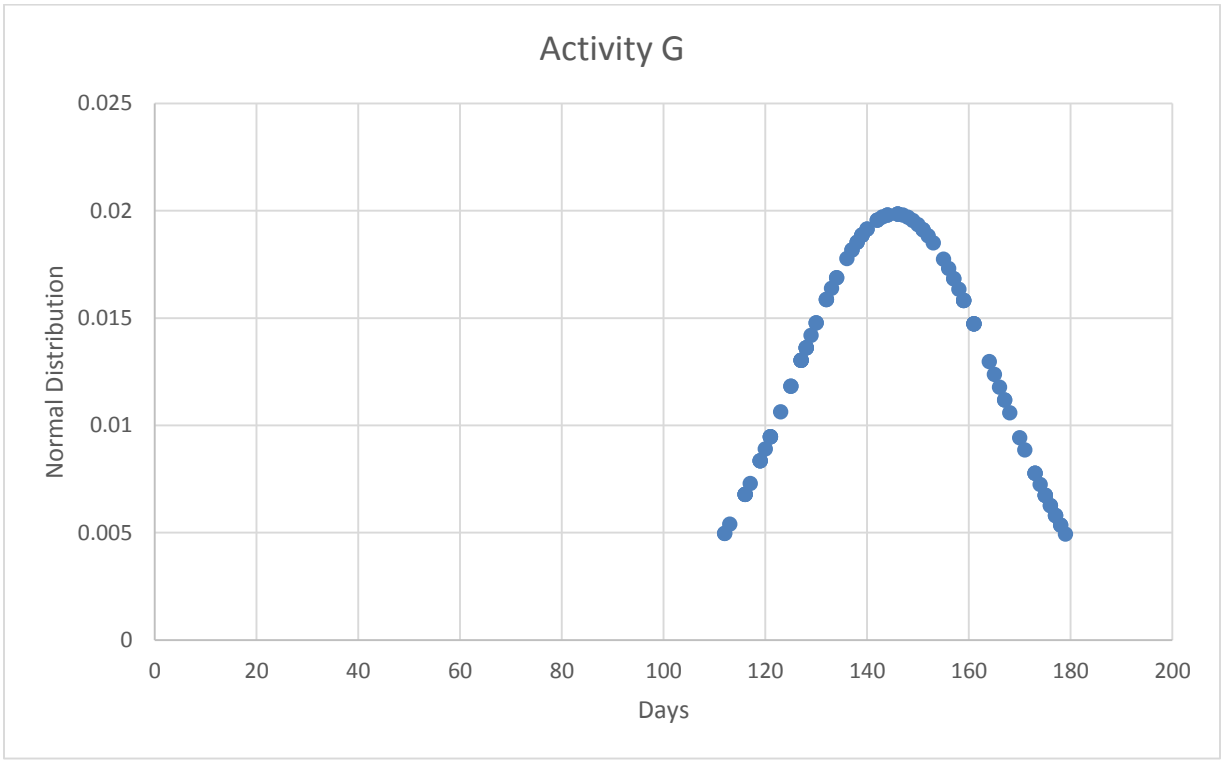


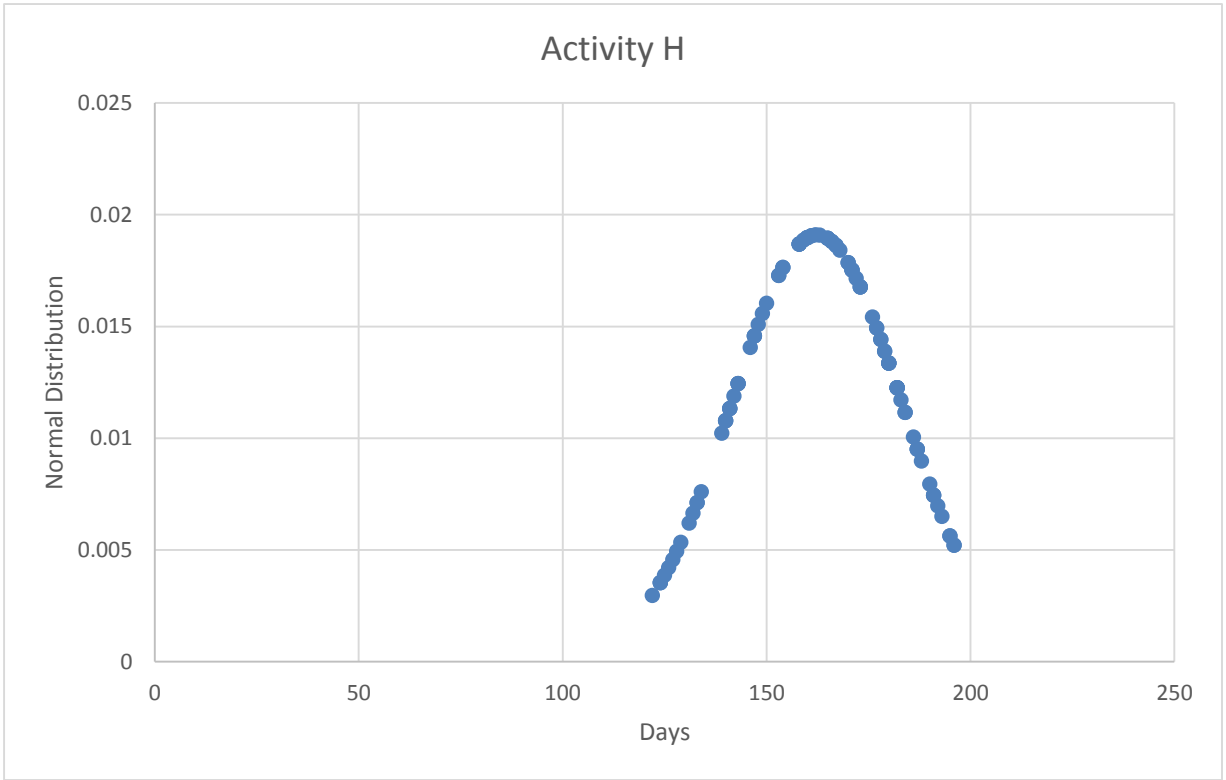

Activity C
Normal Distribution
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
10
20
30
40
50
60
70
Days


Activity D
Normal Distribution
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
10
20
30
40
50
60
70
80
90
100
Days


Activity E
Normal Distribution
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
20
40
60
80
100
120
140
Days


Activity F
Normal Distribution
0.03
0.025
0.02
0.015
0.01
0.005
0
0
20
40
60
80
100
120
140
Days


Activity G
Normal Distribution
0.025
0.02
0.015
0.01
0.005
0
0
20
40
60
80
100
120
140
160
180
200
Days


Activity H
Normal Distribution
0.025
0.02
0.015
0.01
0.005
0
0
50
100
150
200
250
Days

MODEL-11

TABLE-12

ACTIVITY ID	ACTIVITY DESCRIPTION	PROBABILITY	MEAN DURATION	COEFF. OF VARIAT-ION (%)	STAND-ARD DEVIAT-ION	ROUNDED OFF S.D	RANGE
A	CLEARING & GRUBBING	GAUSSIAN	20	20	4	4	16-24
B	EARTH WORK-EXCAVATION	GAUSSIAN	29	20	5.8	6	23-35
C	EMBANK-MENT &SUBGRADE	GAUSSIAN	37	20	7.4	7	30-44
D	GRANNULAR SUBBASE	GAUSSIAN	58	20	11.6	12	46-70
E	WET MIX MACADOM	GAUSSIAN	77	20	15.4	15	62-92
F	KERB CASTING	GAUSSIAN	75	20	15	15	60-90
G	ASPHALT WORKS	GAUSSIAN	112	20	22.4	22	90-134
H	BITUMINOUS CONCRETE	GAUSSIAN	122	20	24.4	24	98-146
I	END	GAUSSIAN	0	0	0	0	0

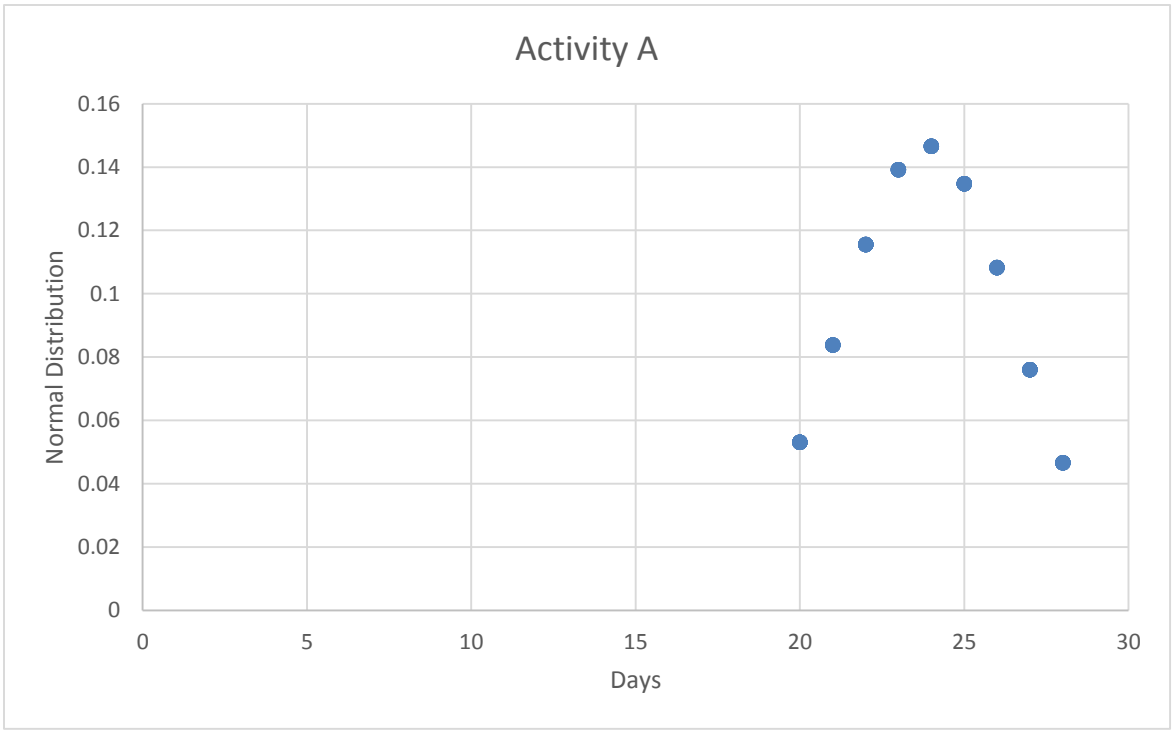
Mean	23.88	34.51	44.31	70.29	90.61	89.11	135.97	141.51
S.D	2.72022	3.67490	4.33378	7.11421	9.47926	8.51960	13.4505	12.9244
CoV	11.3912	10.64882	9.780609	10.12123	10.46161	9.560778	9.892319	9.133211

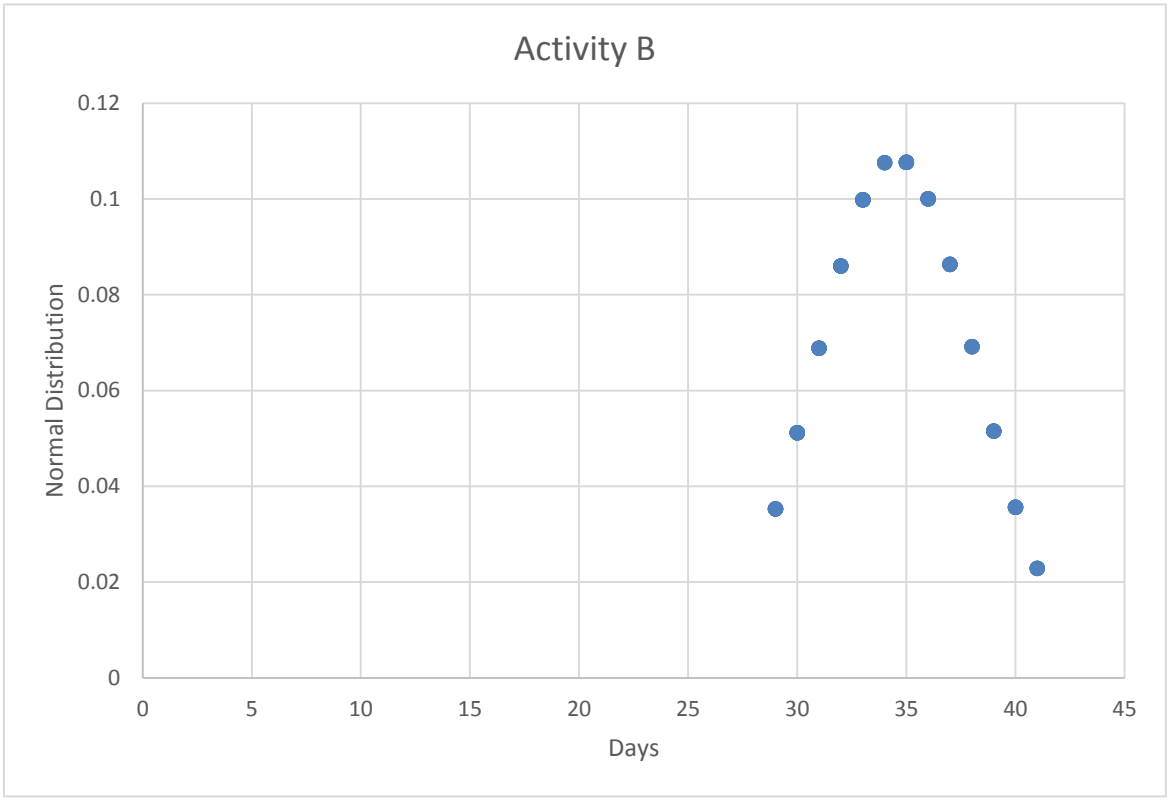
Input- Appendix 11

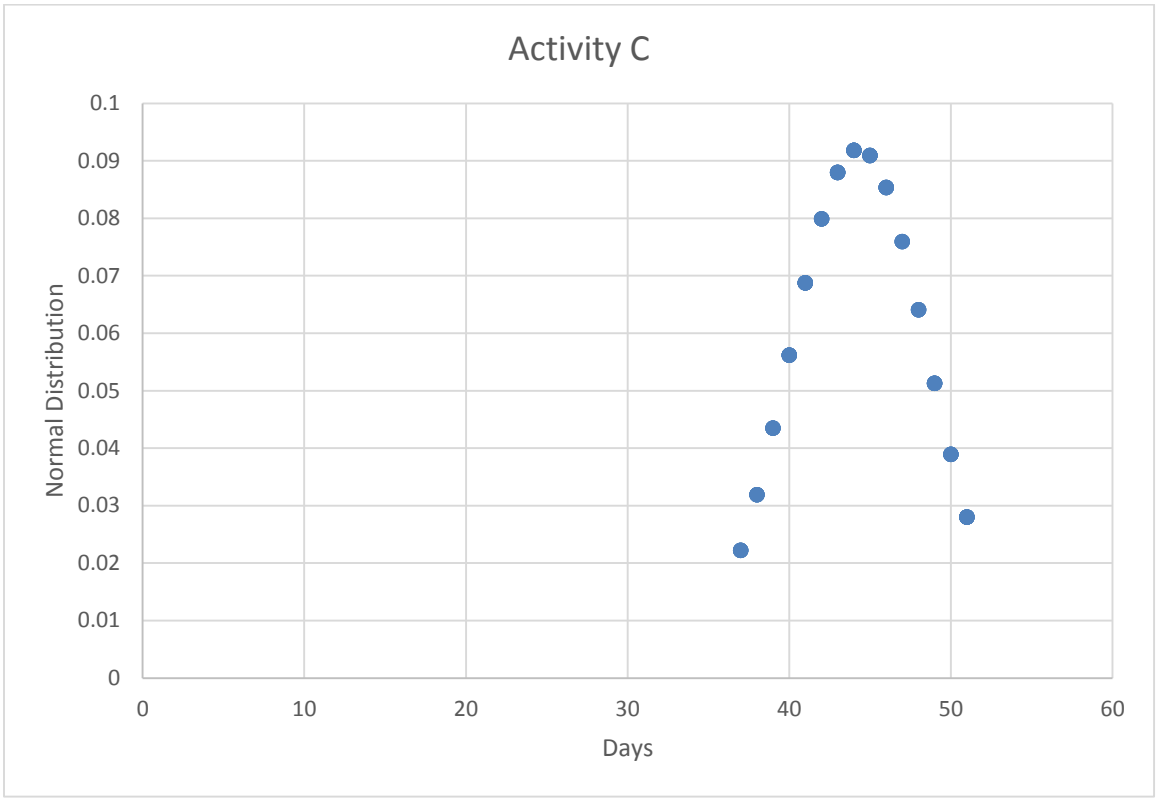
Output- Appendix 11.1

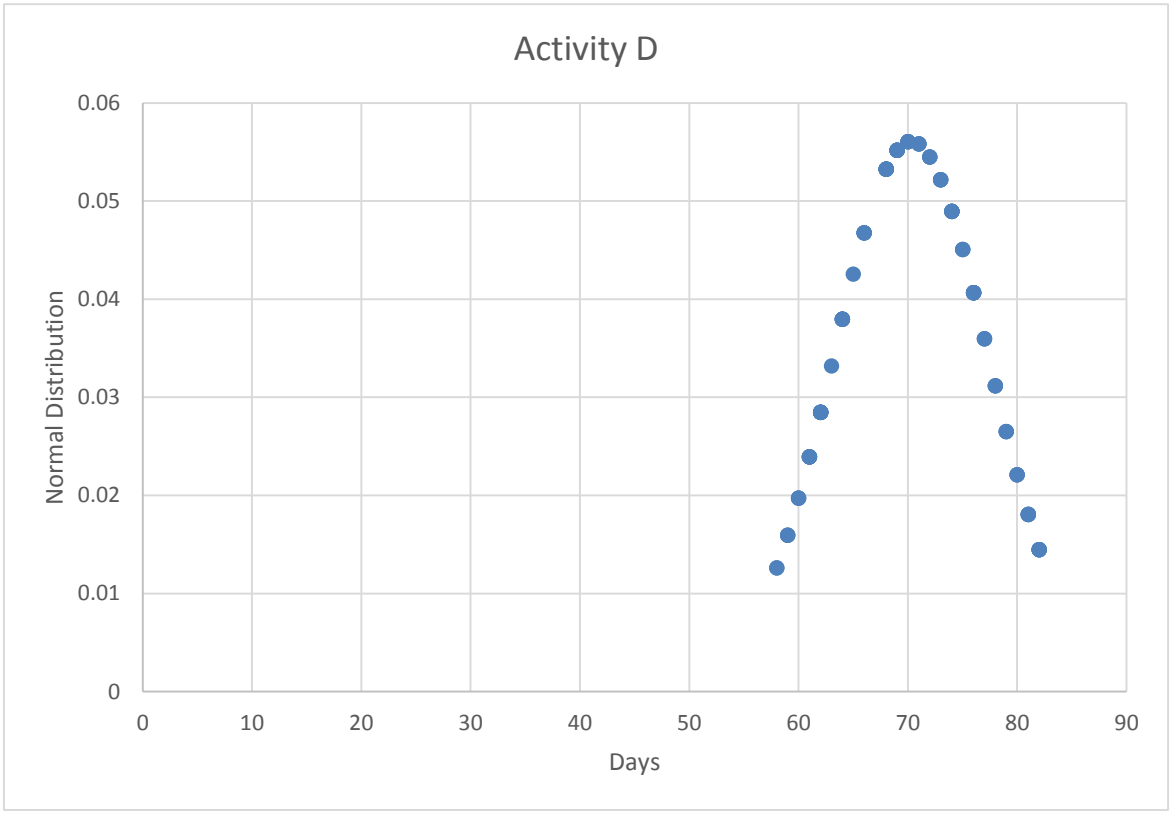
Normal Distribution Graph:

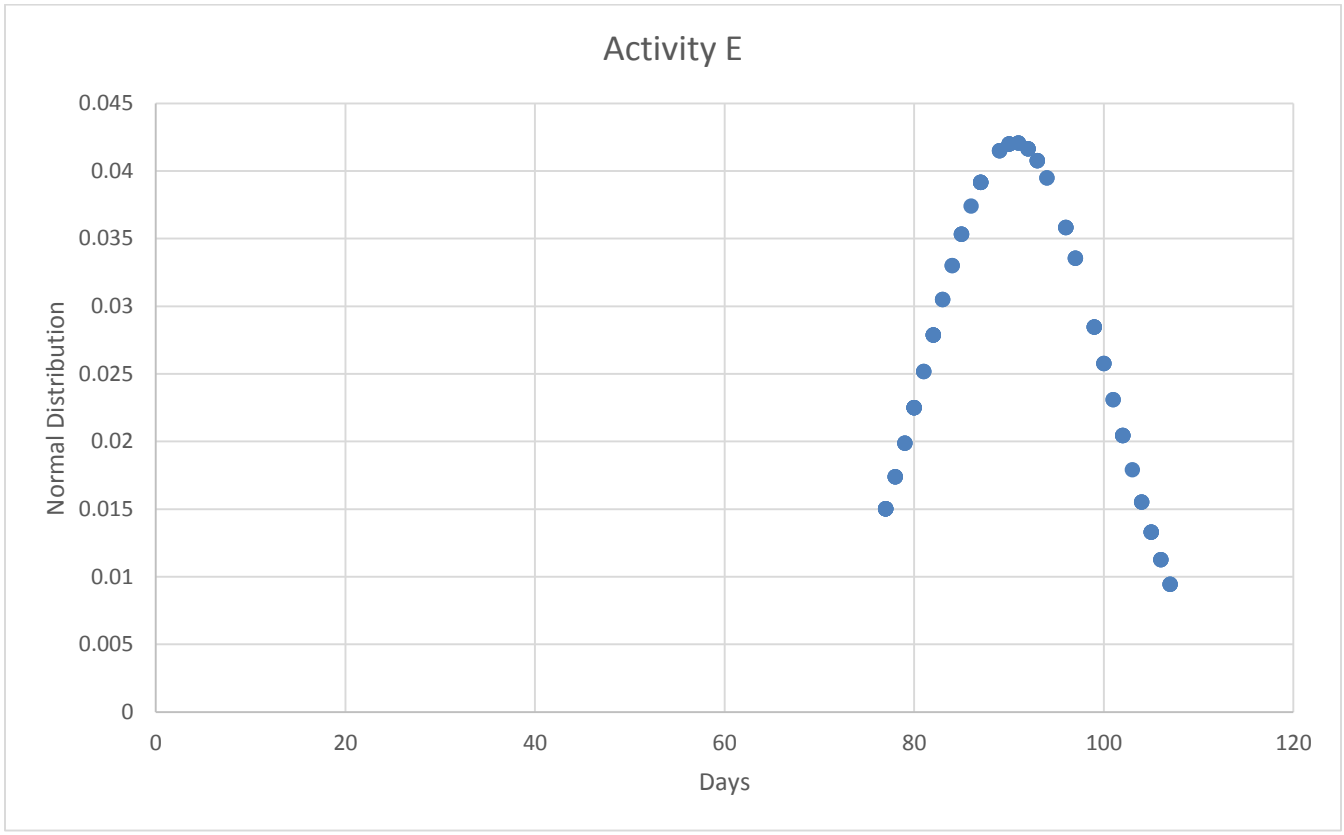
Input- Appendix 11.2

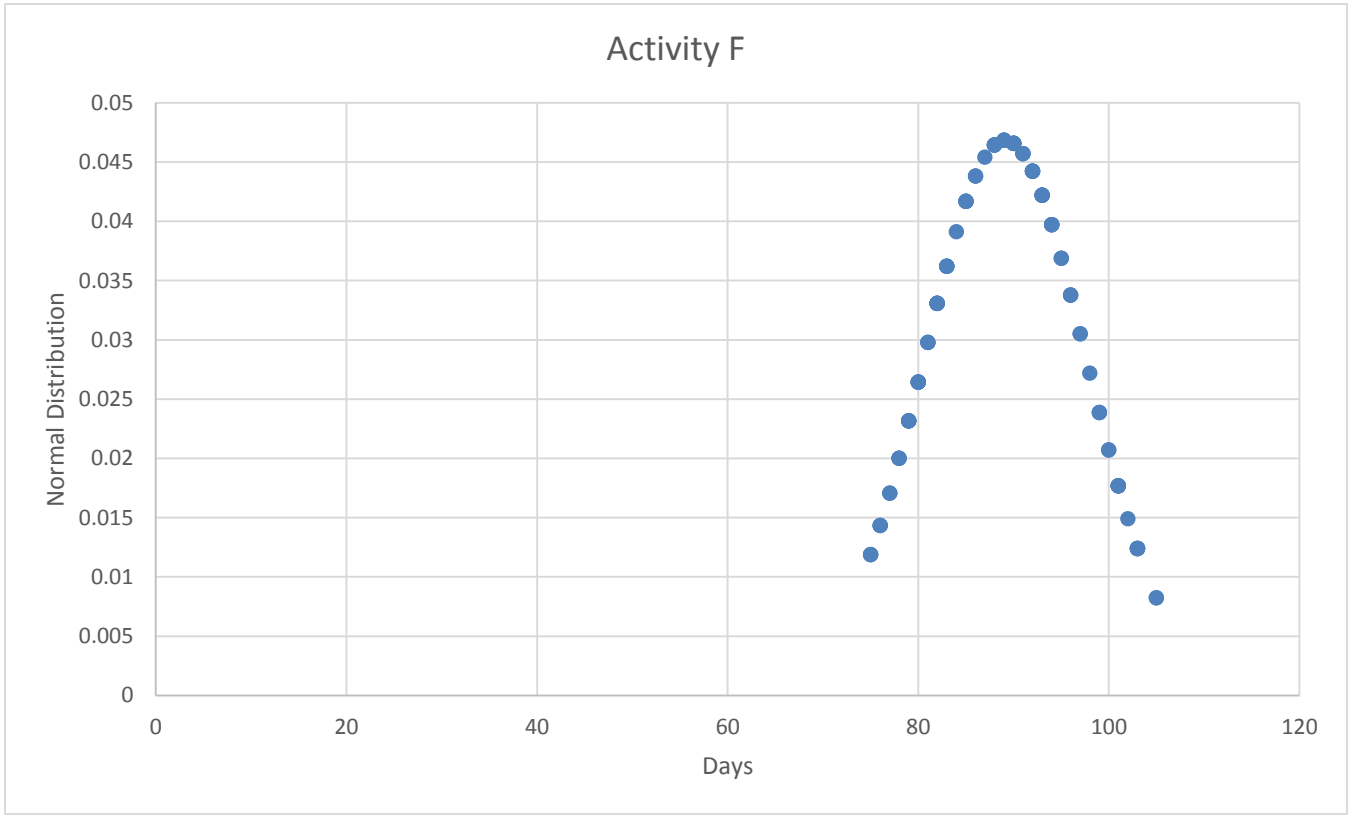


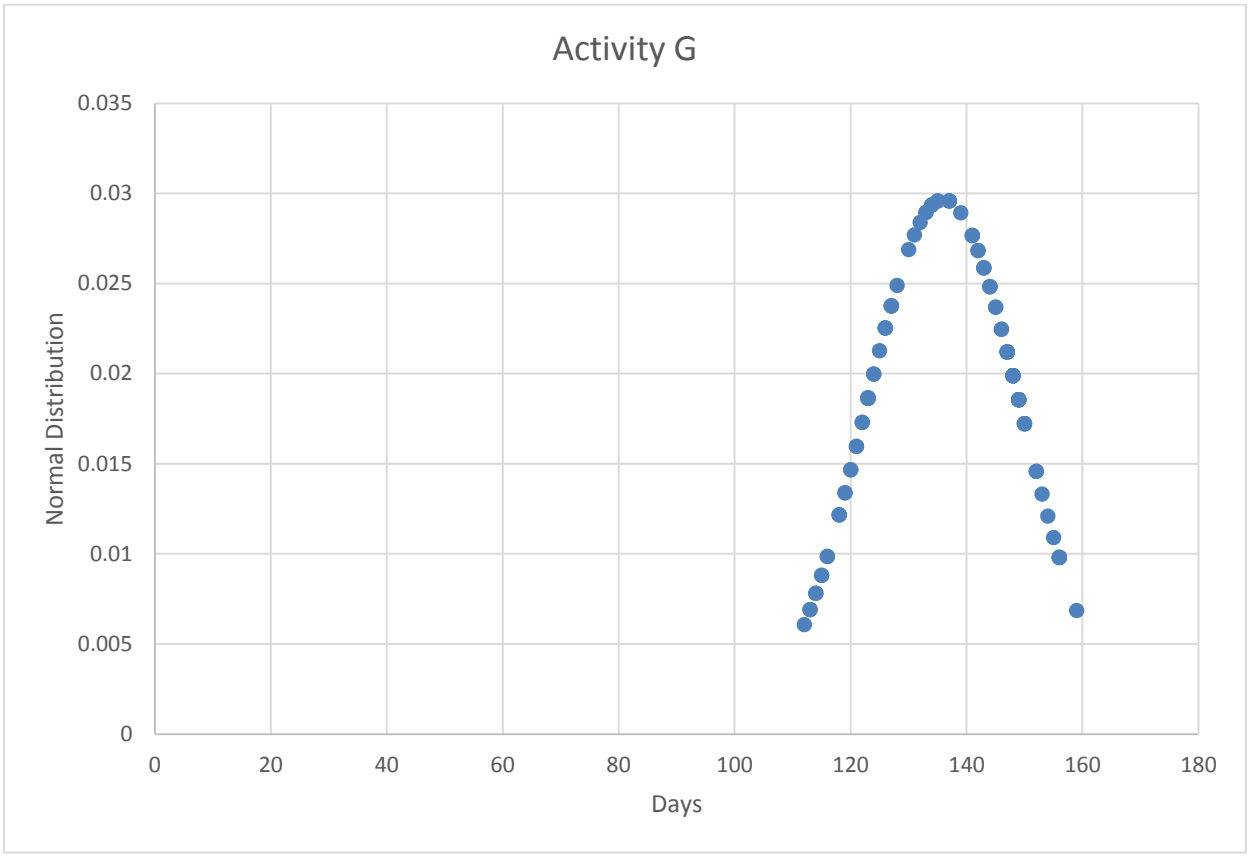


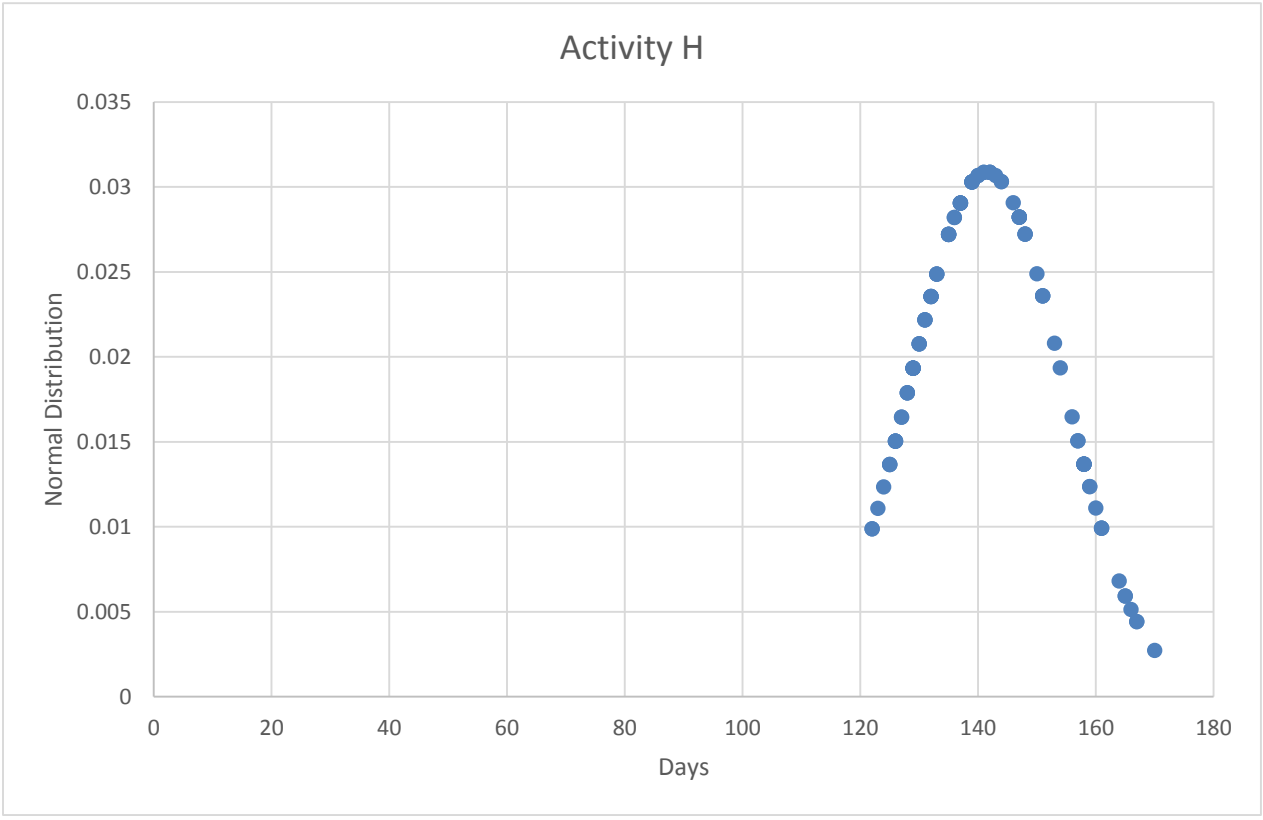

Activity C
Normal Distribution
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
10
20
30
40
50
60
Days


Activity D
Normal Distribution
0.06
0.05
0.04
0.03
0.02
0.01
0
0
10
20
30
40
50
60
70
80
90
Days


Activity E
Normal Distribution
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
20
40
60
80
100
120
Days


Activity F
Normal Distribution
0.05
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
20
40
60
80
100
120
Days


Activity G
Normal Distribution
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
20
40
60
80
100
120
140
160
180
Days


Activity H
Normal Distribution
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
20
40
60
80
100
120
140
160
180
Days

MODEL-12

TABLE-13

ACTIVITY ID	ACTIVITY DESCRIPTION	PROBABILITY	MEAN DURATION	COEFF. OF VARIAT-ION (%)	STAND-ARD DEVIAT-ION	ROUNDED OFF S.D	RANGE
A	CLEARING & GRUBBING	GAUSSIAN	20	15	3	3	17-23
B	EARTH WORK-EXCAVATION	GAUSSIAN	29	15	4.35	4	25-33
C	EMBANK-MENT &SUBGRADE	GAUSSIAN	37	15	5.55	6	31-43
D	GRANNULAR SUBBASE	GAUSSIAN	58	15	8.7	9	49-67
E	WET MIX MACADOM	GAUSSIAN	77	15	11.55	12	65-89
F	KERB CASTING	GAUSSIAN	75	15	11.25	11	64-86
G	ASPHALT WORKS	GAUSSIAN	112	15	16.8	17	95-129
H	BITUMINOUS CONCRETE	GAUSSIAN	122	15	18.3	18	104-140
I	END	GAUSSIAN	0	0	0	0	0

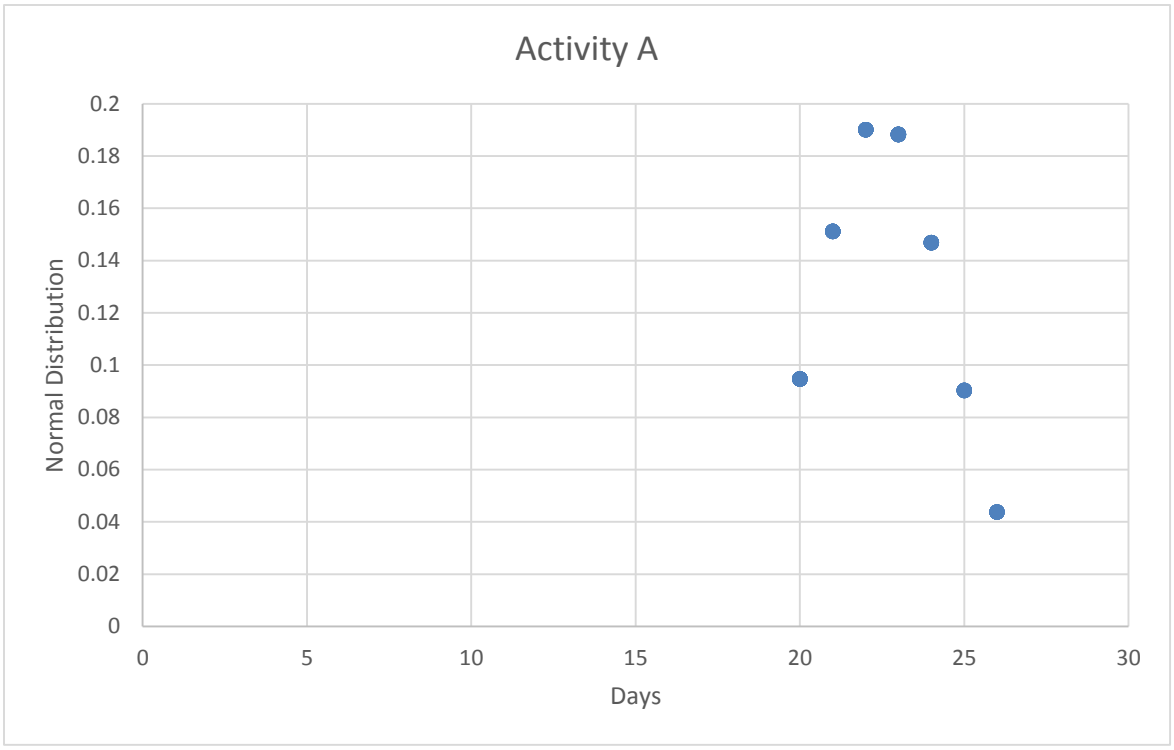
Mean	22.46	33.22	43.08	66.94	89.24	86.1	129.63	142.5
S.D	2.04702	2.47647	3.75157	5.61531	7.40068	6.86890	10.2342	10.27451
CoV	9.11408	7.45477	8.7084	8.38857	8.29301	7.97781	7.89499	7.21018

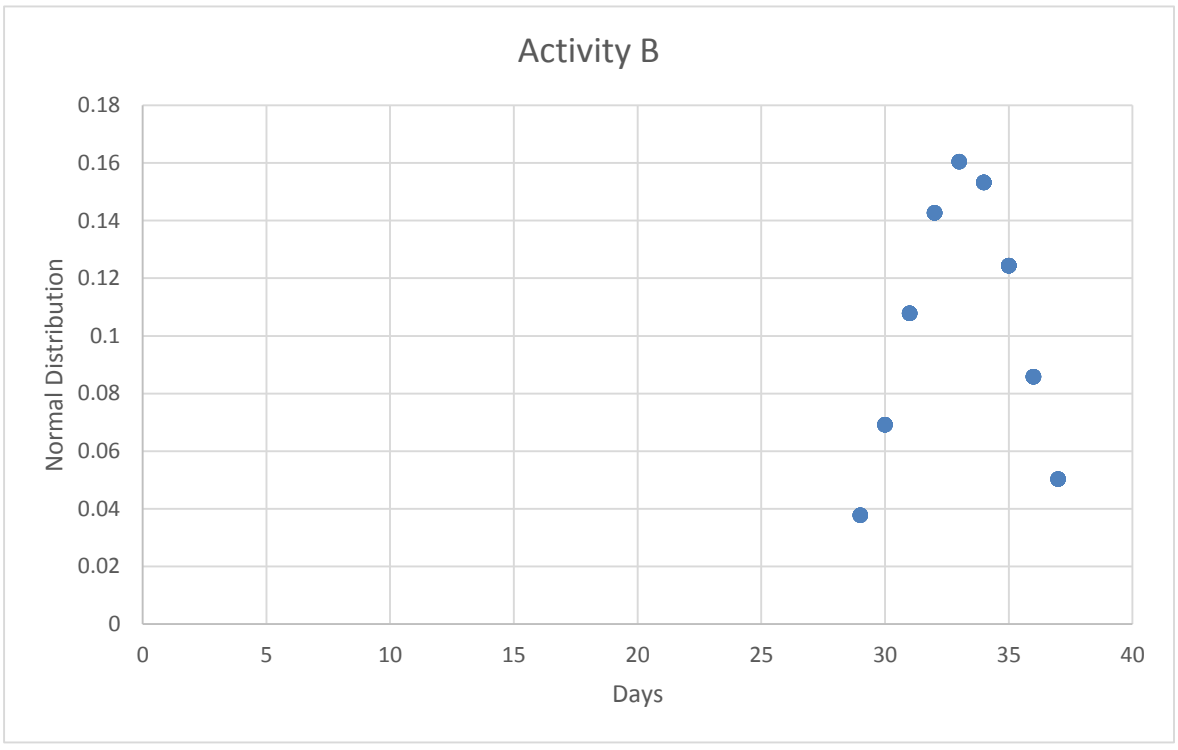
Input- Appendix 12

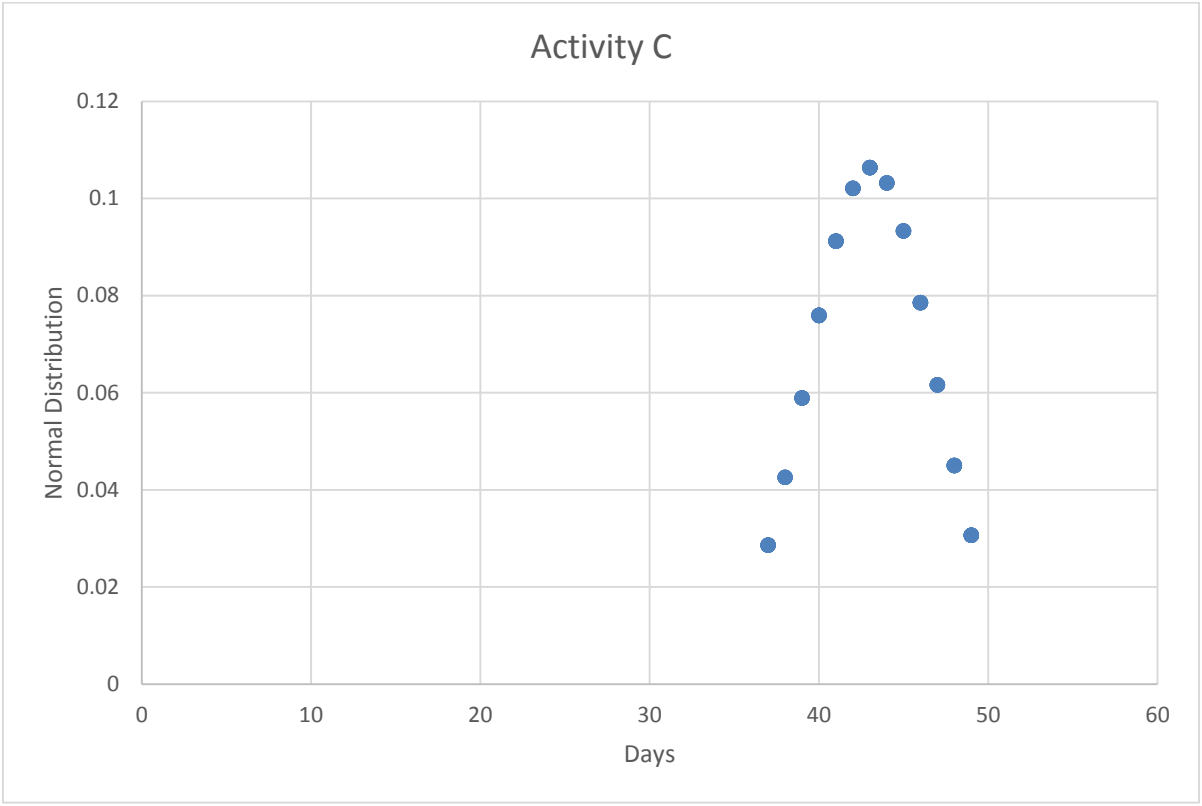
Output- Appendix 12.1

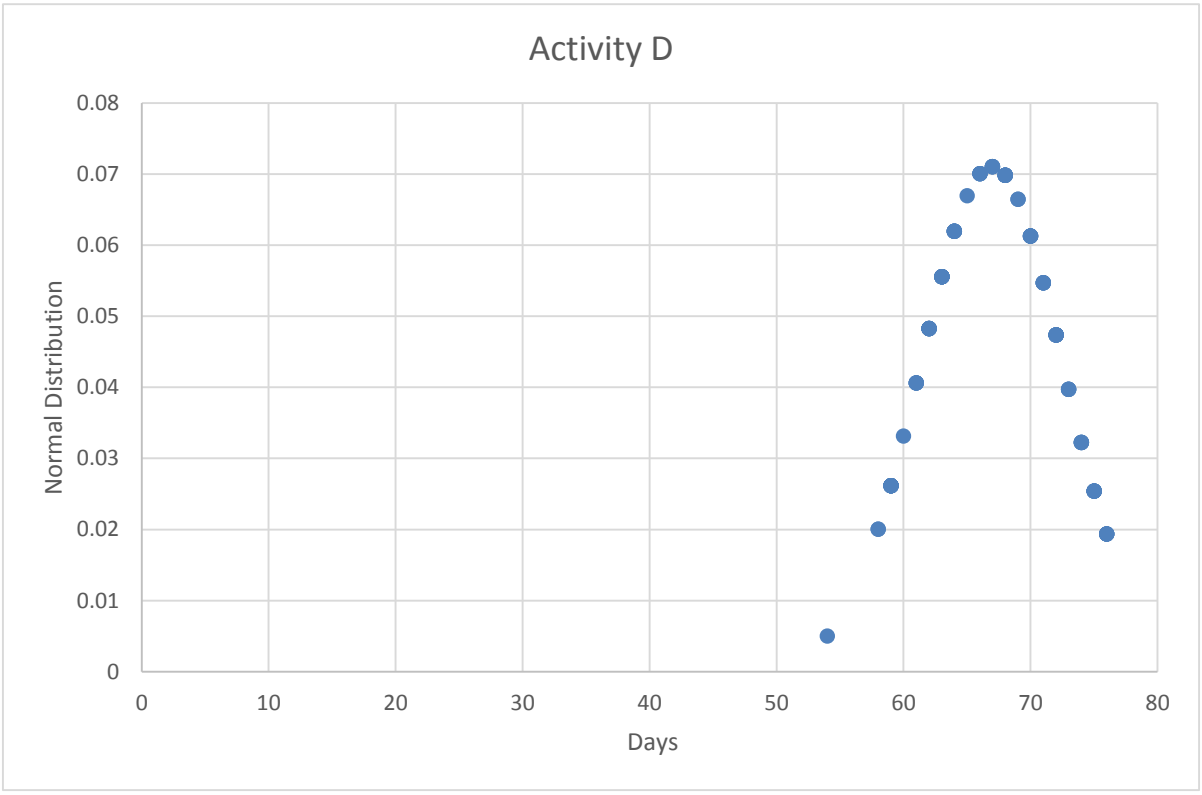
Normal Distribution Graph:

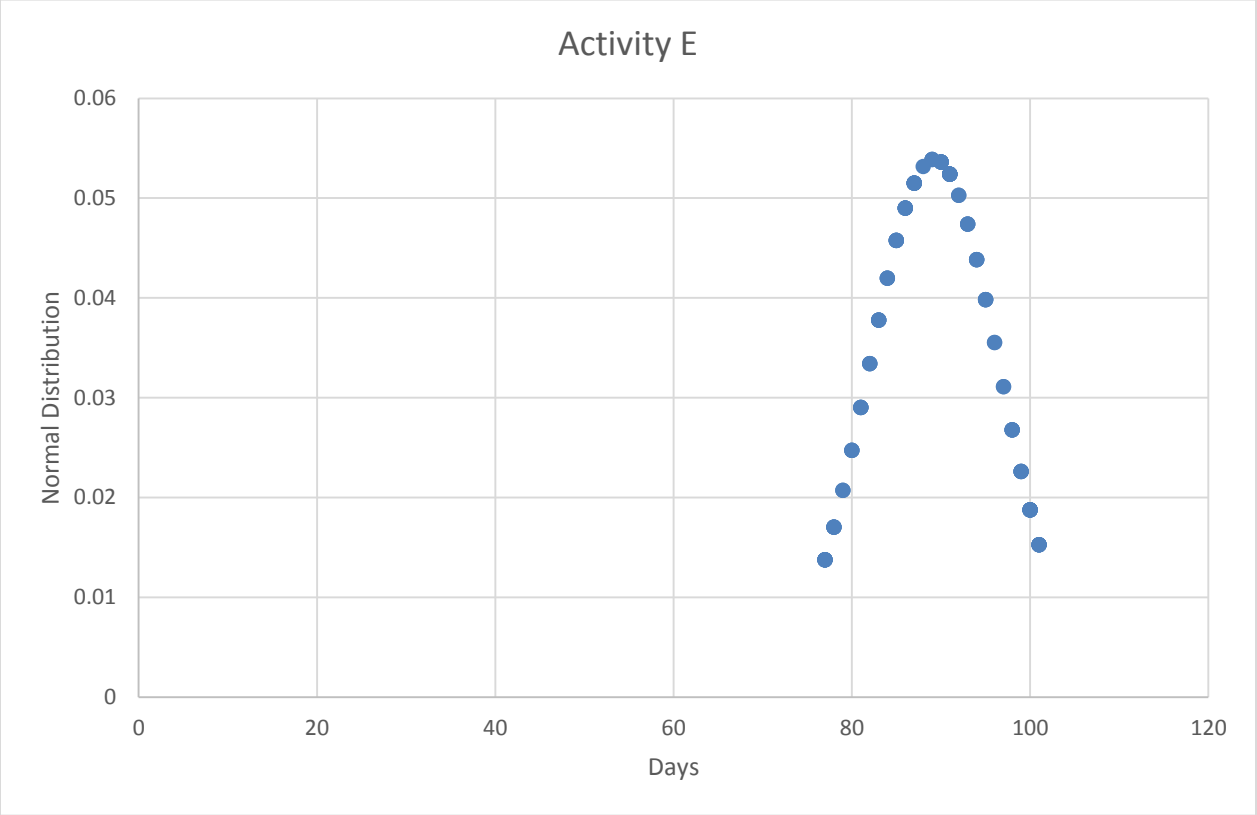
Input- Appendix 12.2

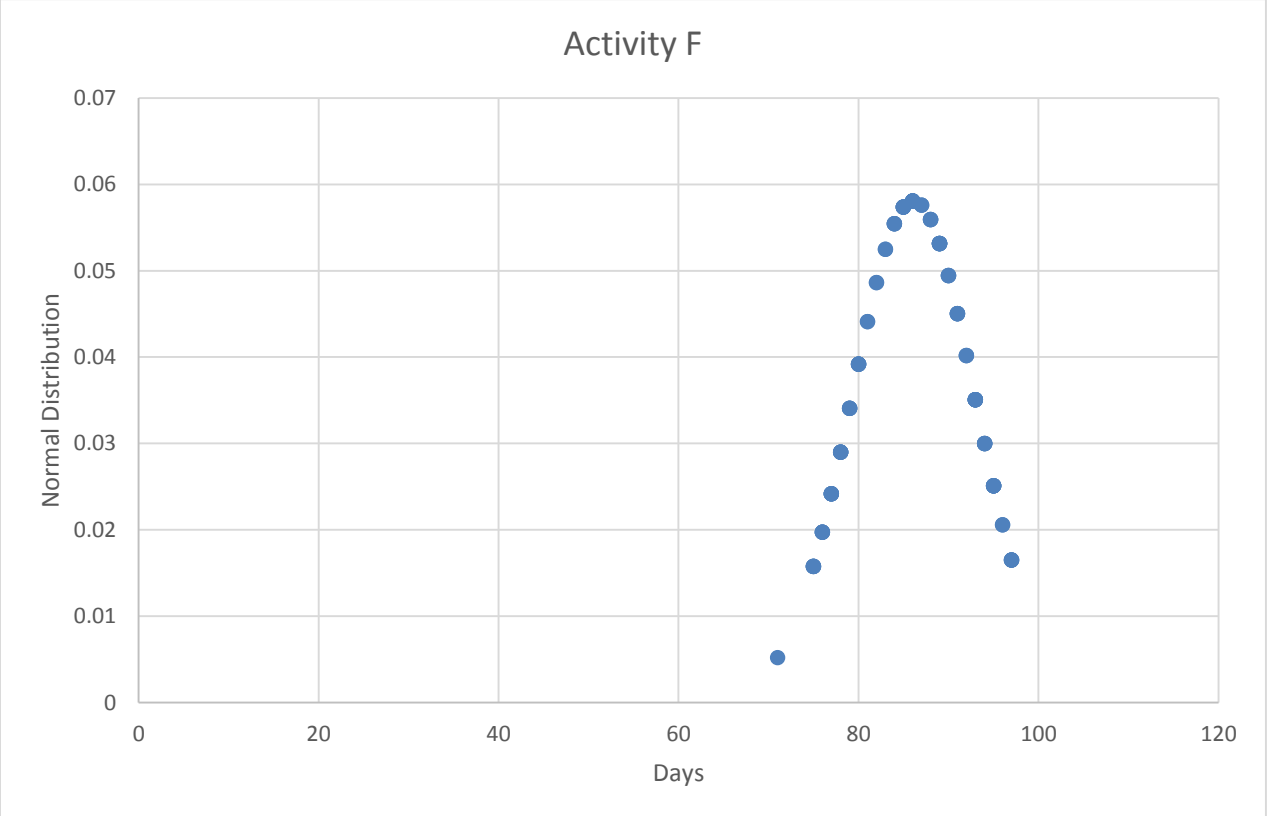


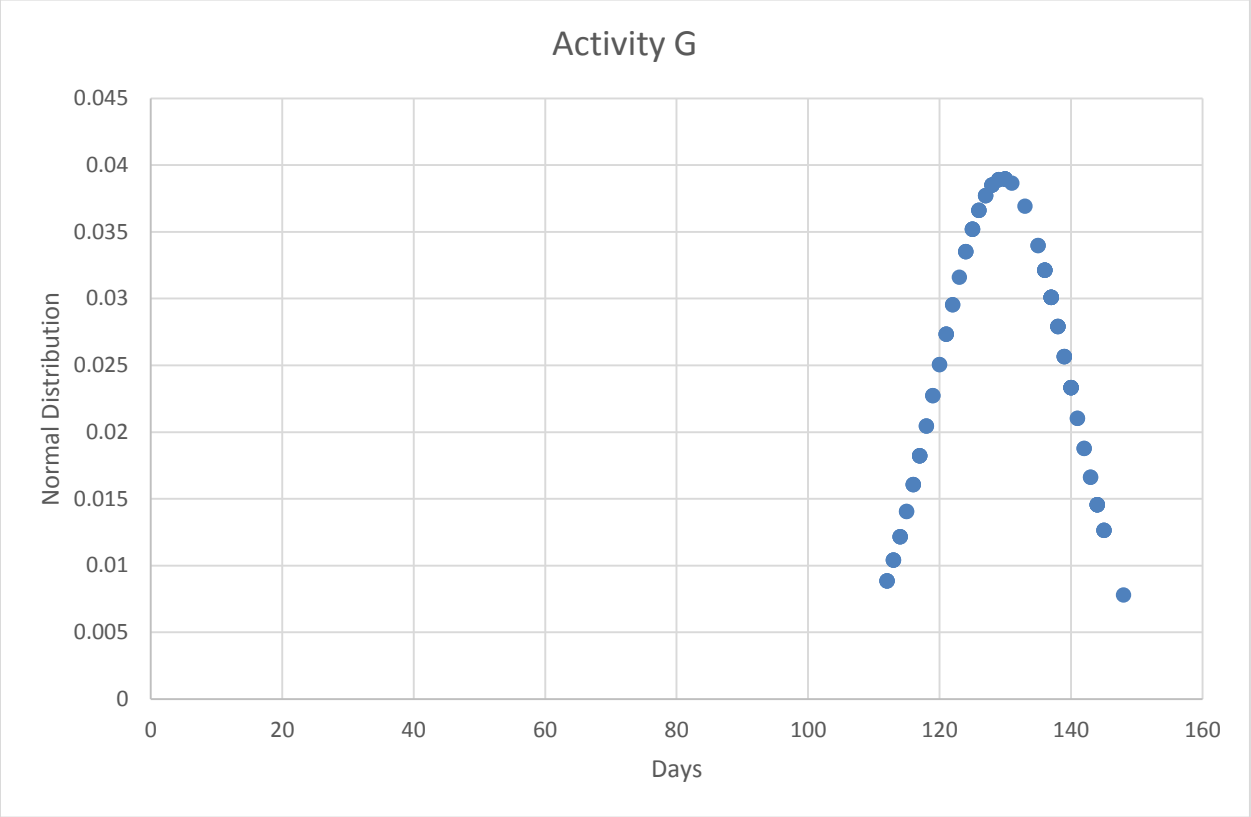


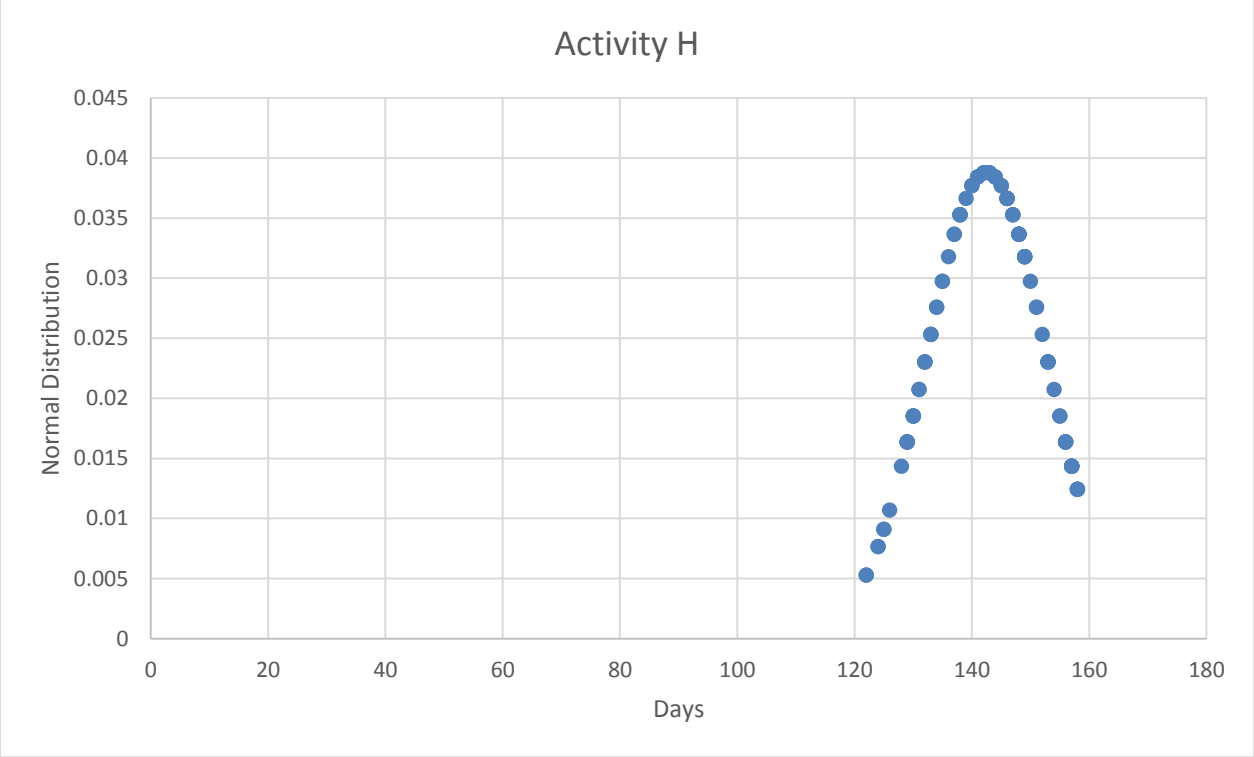

Activity C
Normal Distribution
0.12
0.1
0.08
0.06
0.04
0.02
0
0
10
20
30
40
50
60
Days


Activity D
Normal Distribution
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
10
20
30
40
50
60
70
80
Days


Activity E
Normal Distribution
0.06
0.05
0.04
0.03
0.02
0.01
0
0
20
40
60
80
100
120
Days


Activity F
Normal Distribution
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
20
40
60
80
100
120
Days


Activity G
Normal Distribution
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
20
40
60
80
100
120
140
160
Days


Activity H
Normal Distribution
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
20
40
60
80
100
120
140
160
180
Days

MODEL-13

TABLE-14

ACTIVITY ID	ACTIVITY DESCRIPTION	PROBABILITY	MEAN DURATION	COEFF. OF VARIAT-ION (%)	STAND-ARD DEVIAT-ION	ROUNDED OFF S.D	RANGE
A	CLEARING & GRUBBING	GAUSSIAN	20	10	2	2	18-22
B	EARTH WORK-EXCAVATION	GAUSSIAN	29	10	2.9	3	26-32
C	EMBANK-MENT &SUBGRADE	GAUSSIAN	37	10	3.7	4	33-41
D	GRANNULAR SUBBASE	GAUSSIAN	58	10	5.8	6	52-64
E	WET MIX MACADOM	GAUSSIAN	77	10	7.7	8	69-85
F	KERB CASTING	GAUSSIAN	75	10	7.5	8	67-82
G	ASPHALT WORKS	GAUSSIAN	112	10	11.2	11	101-123
H	BITUMINOUS CONCRETE	GAUSSIAN	122	10	12.2	12	110-134
I	END	GAUSSIAN	0	0	0	0	0

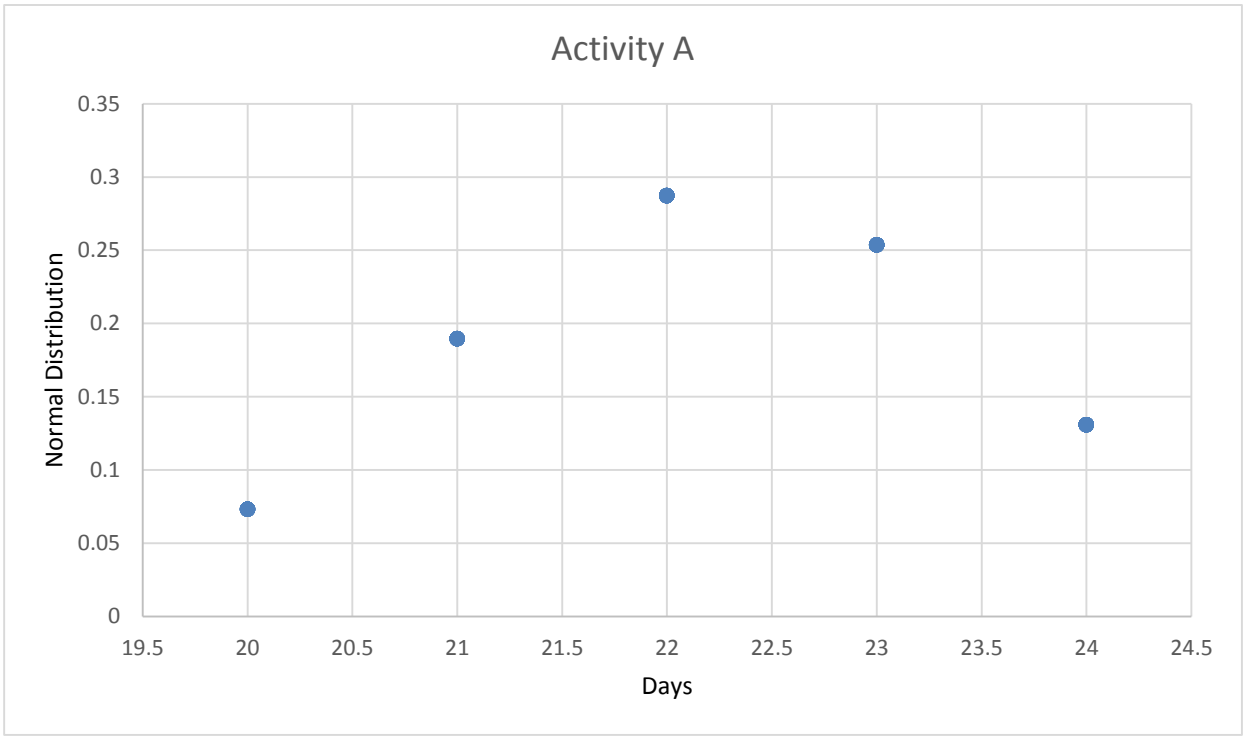
Mean	22.27	31.9	40.62	63.84	84.35	82.18	123.15	133.84
S.D	1.36222	1.850471	2.351788	3.727376	5.023933	4.610879	6.723057	7.515264
CoV	6.11686	5.80084	5.78973	5.83862	5.95605	5.61070	5.45924	5.61511

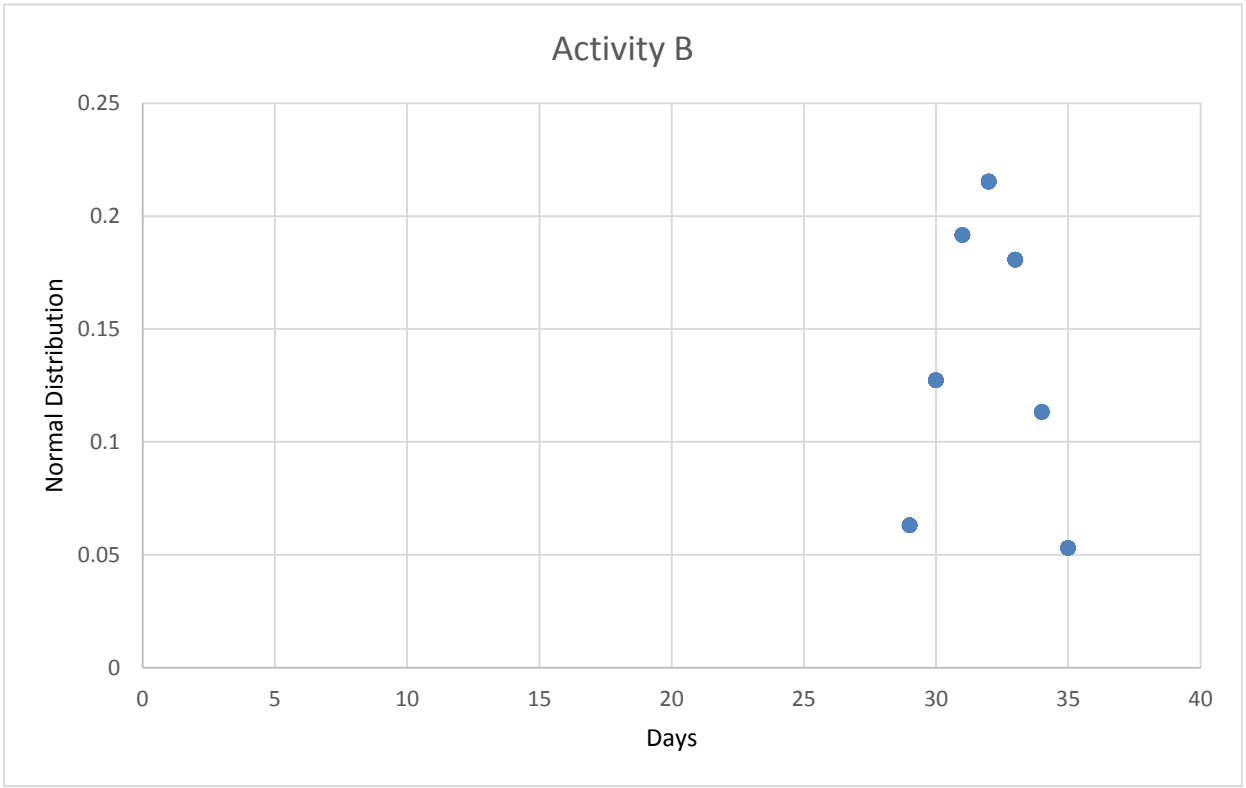
Input- Appendix 13

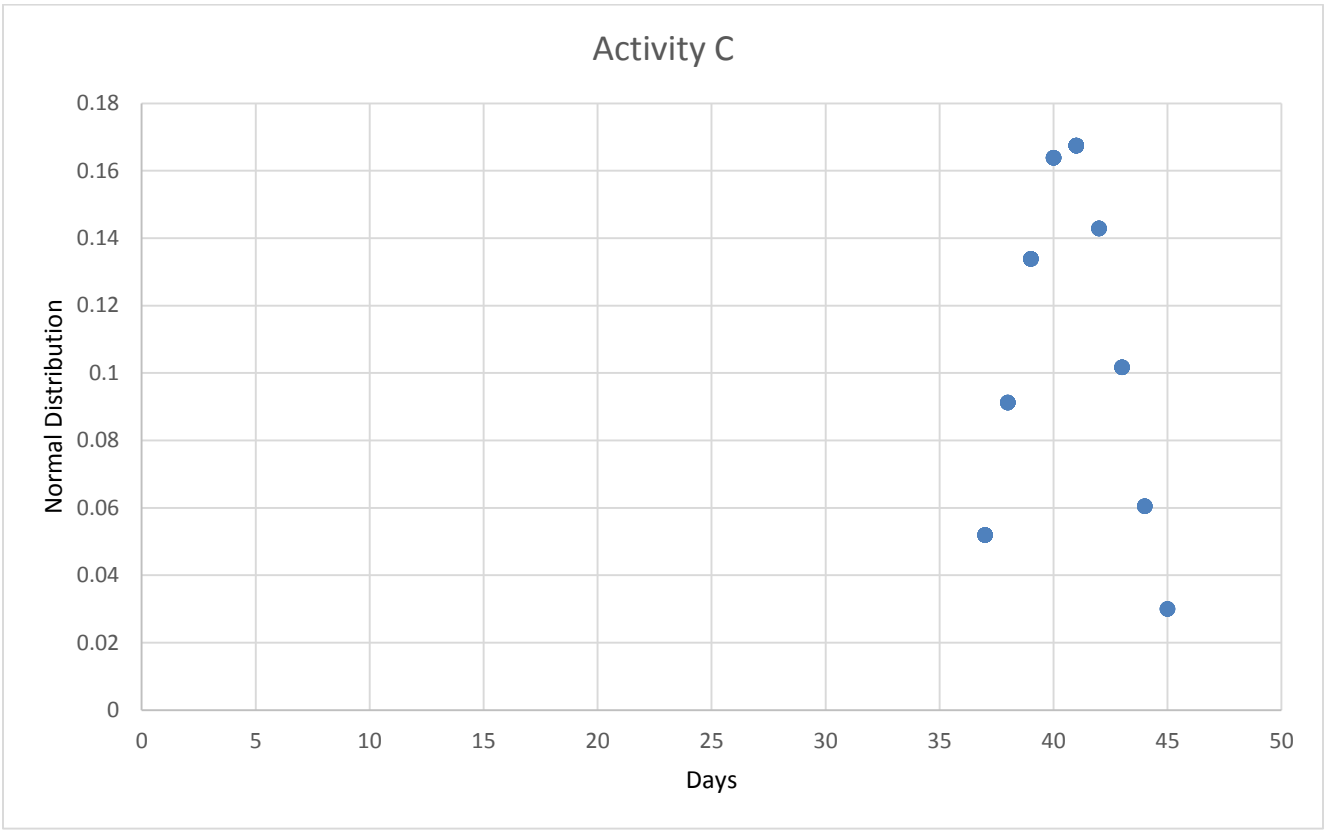
Output- Appendix 13.1

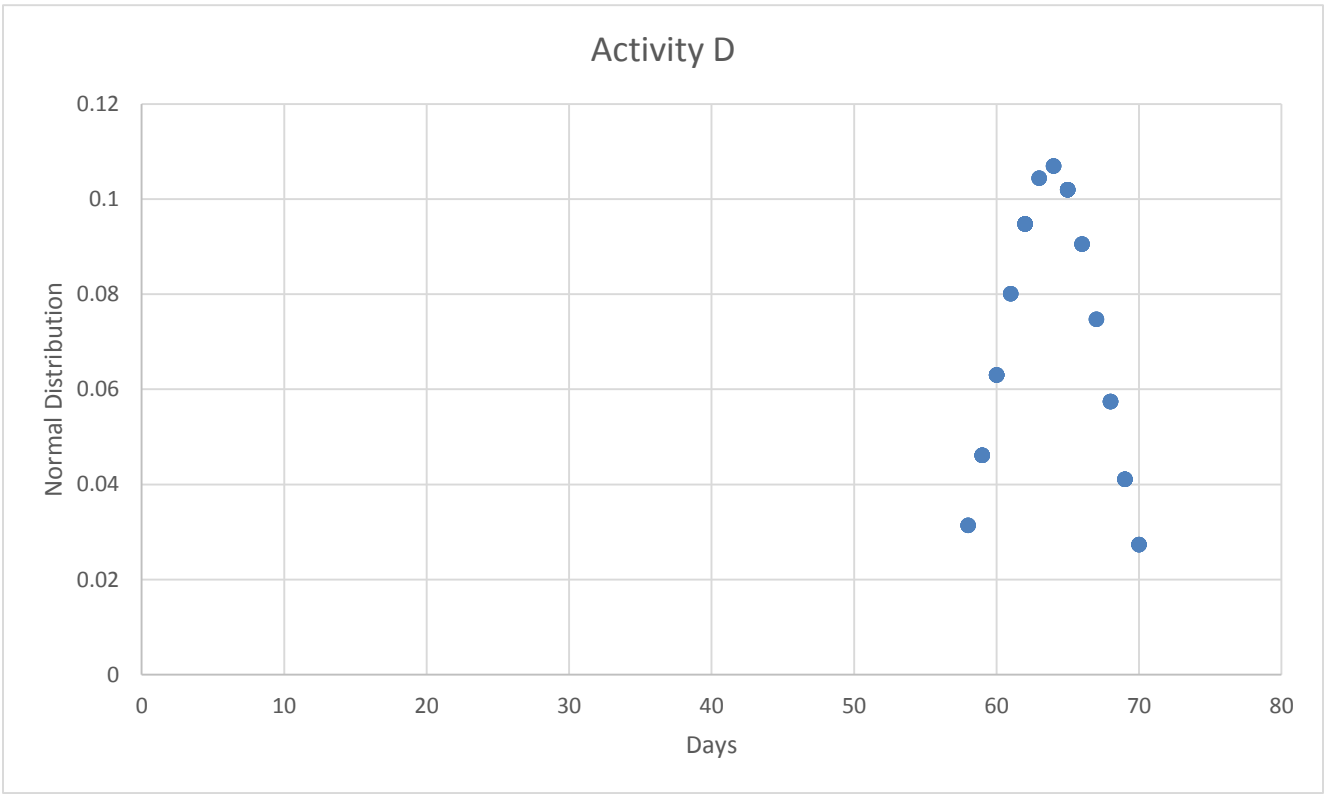
Normal Distribution Graph:

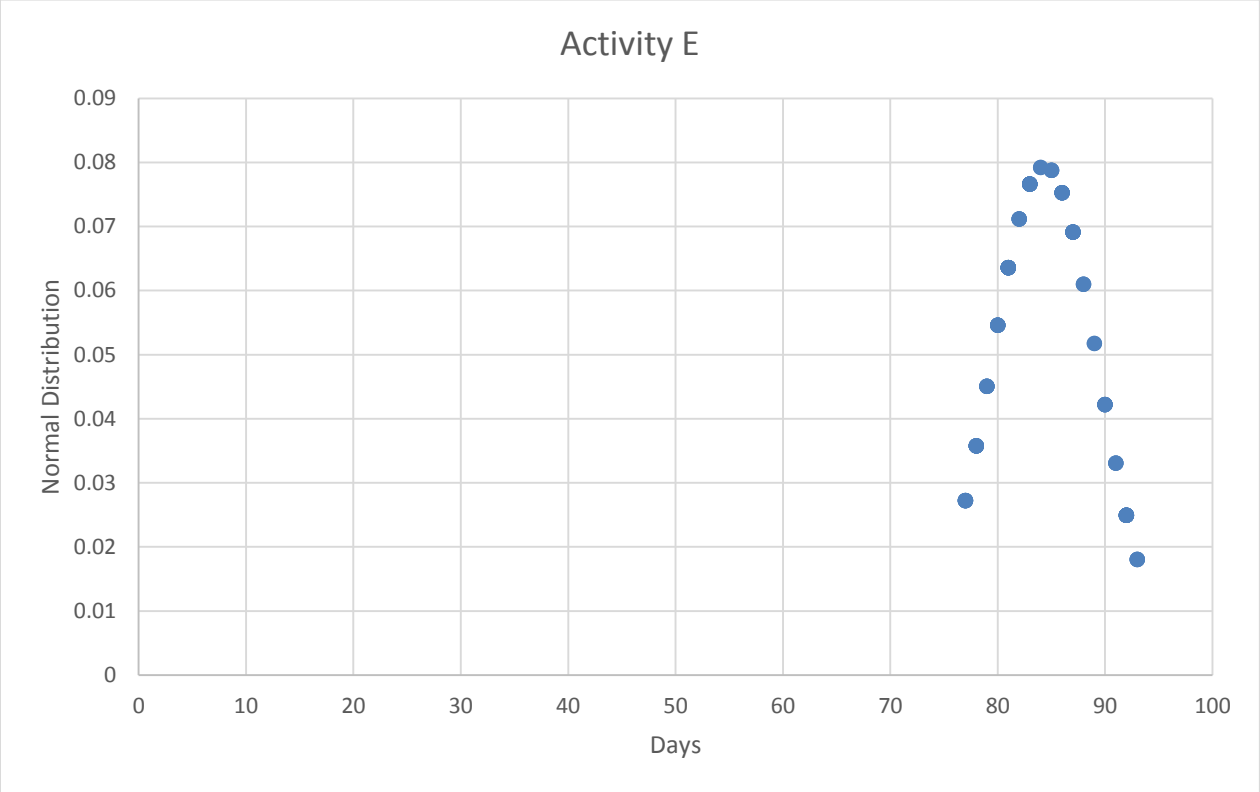
Input- Appendix 13.2

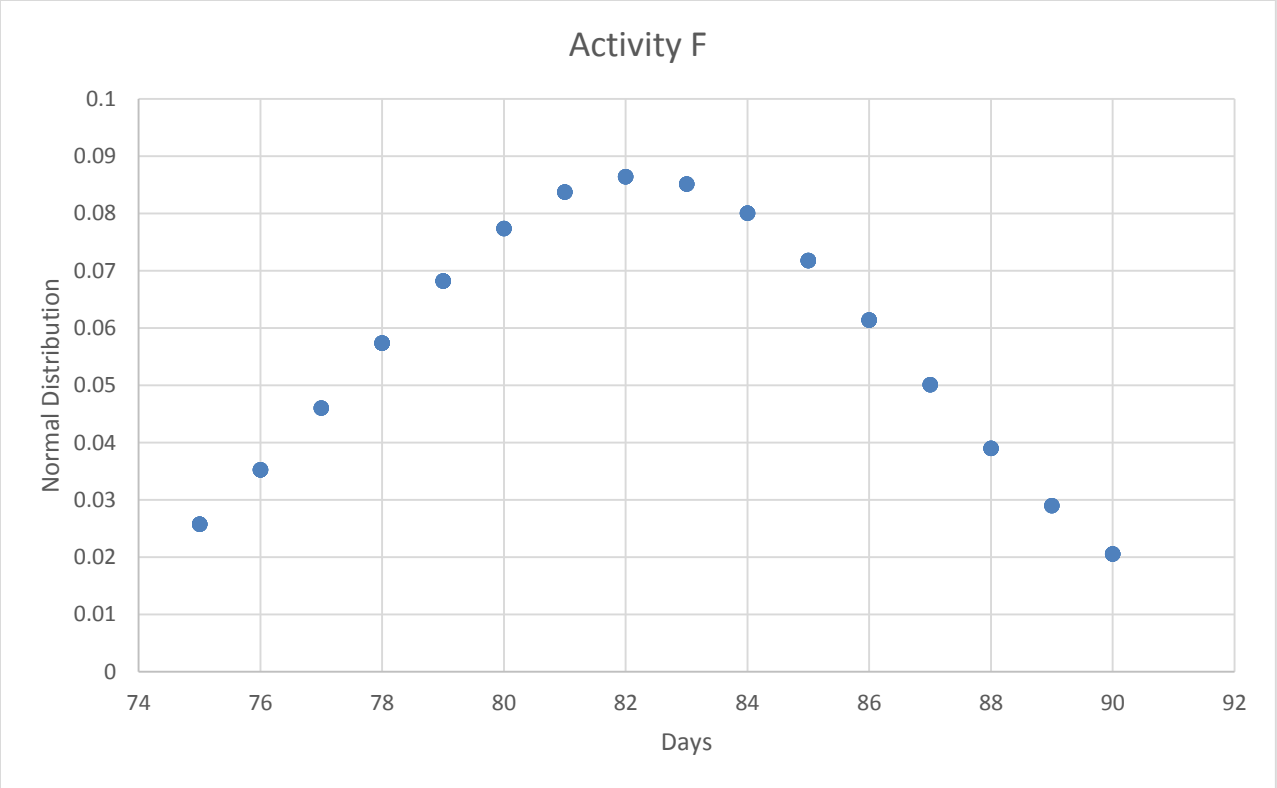


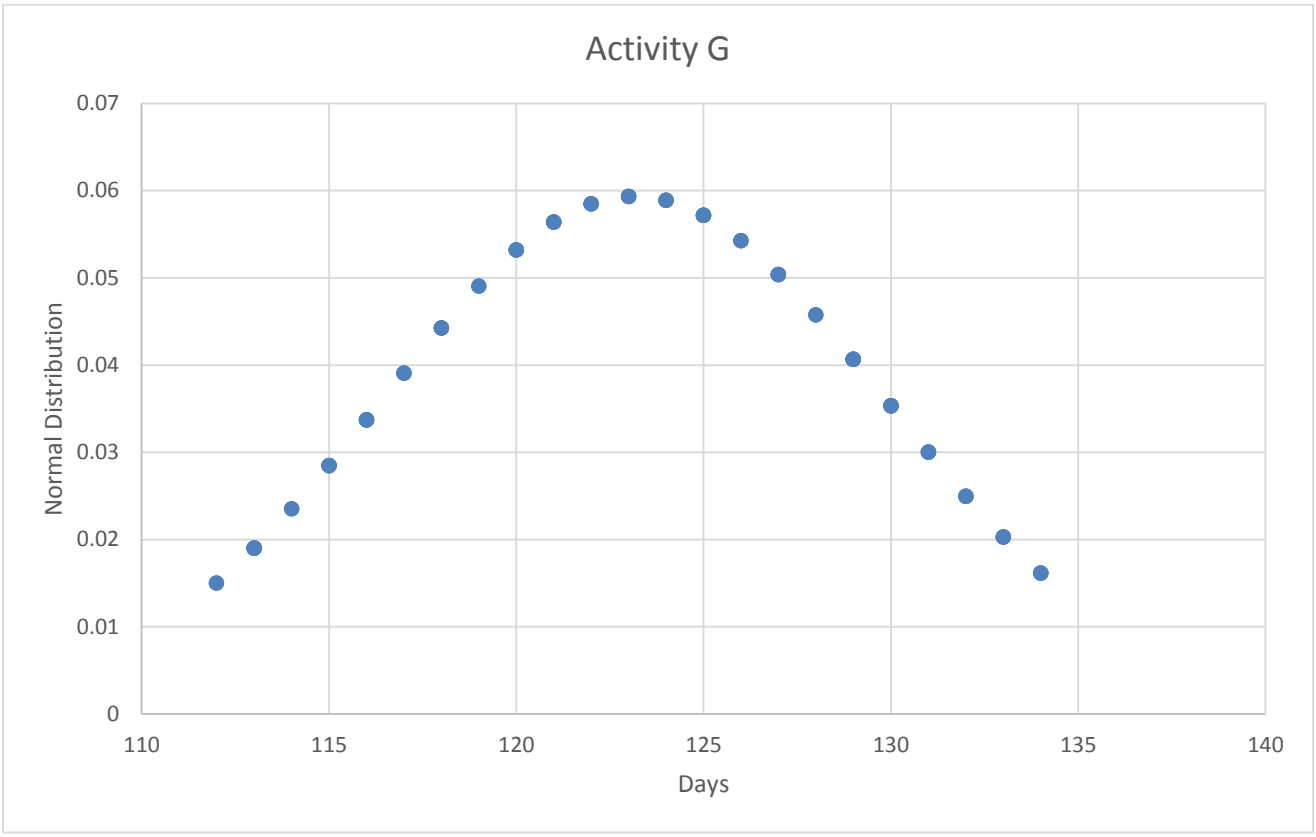


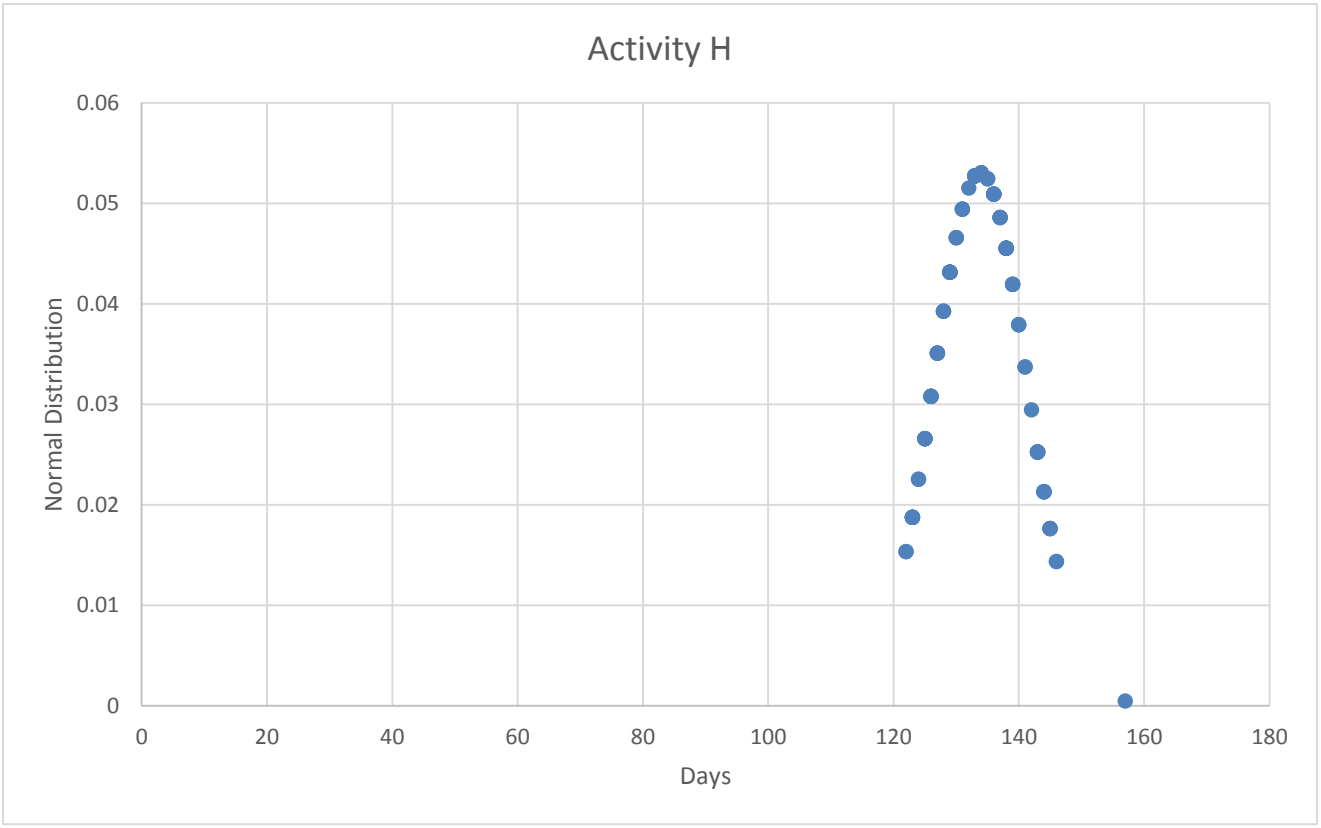

Activity C
Normal Distribution
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
5
10
15
20
25
30
35
40
45
50
Days


Activity D
Normal Distribution
0.12
0.1
0.08
0.06
0.04
0.02
0
0
10
20
30
40
50
60
70
80
Days


Activity E
Normal Distribution
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
10
20
30
40
50
60
70
80
90
100
Days


Activity F
Normal Distribution
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
74
76
78
80
82
84
86
88
90
92
Days


Activity G
Normal Distribution
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
110
115
120
125
130
135
140
Days


Activity H
Normal Distribution
0.06
0.05
0.04
0.03
0.02
0.01
0
0
20
40
60
80
100
120
140
160
180
Days

MODEL-14

TABLE-15

ACTIVITY ID	ACTIVITY DESCRIPTION	PROBABILITY	MEAN DURATION	COEFF. OF VARIAT-ION (%)	STAND-ARD DEVIAT-ION	ROUNDED OFF S.D	RANGE
A	CLEARING & GRUBBING	GAUSSIAN	20	5	1	1	19-21
B	EARTH WORK-EXCAVATION	GAUSSIAN	29	5	1.45	2	27-31
C	EMBANK-MENT &SUBGRADE	GAUSSIAN	37	5	1.85	2	35-39
D	GRANNULAR SUBBASE	GAUSSIAN	58	5	2.9	3	55-61
E	WET MIX MACADOM	GAUSSIAN	77	5	3.85	4	73-81
F	KERB CASTING	GAUSSIAN	75	5	3.75	4	71-79
G	ASPHALT WORKS	GAUSSIAN	112	5	5.6	6	106-118
H	BITUMINOUS CONCRETE	GAUSSIAN	122	5	6.1	6	116-128
I	END	GAUSSIAN	0	0	0	0	0

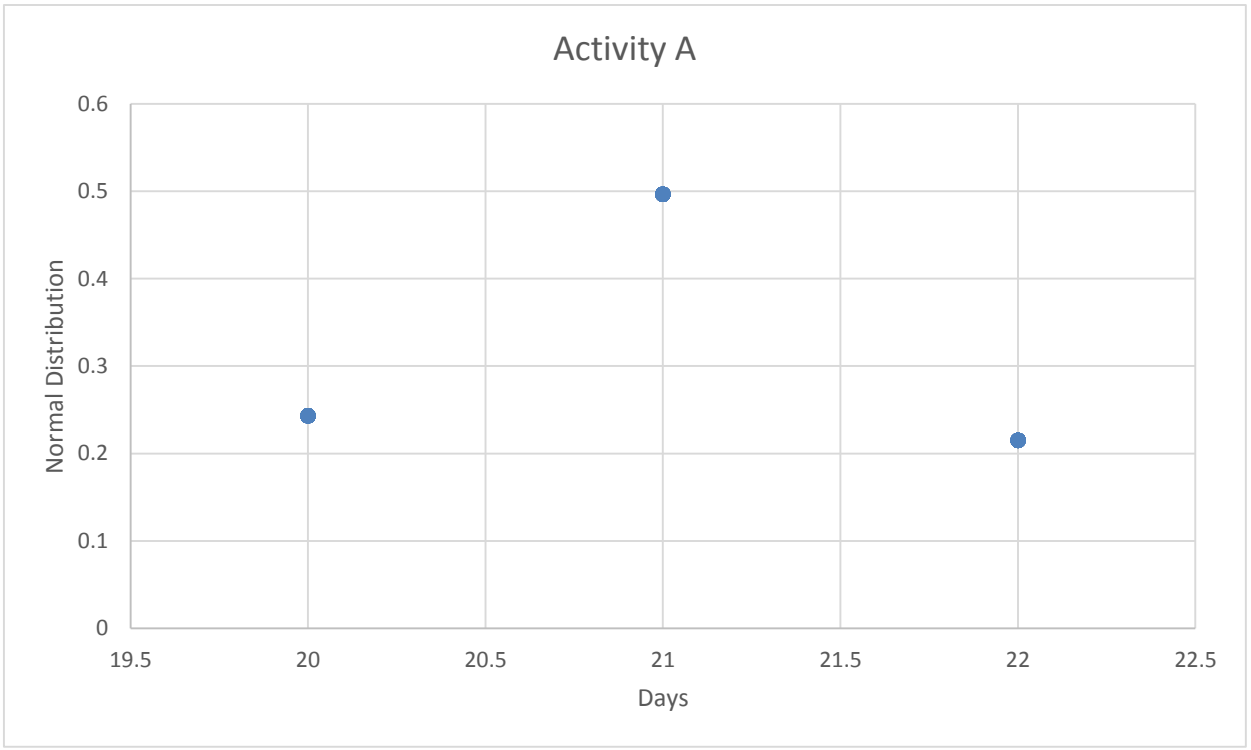
Mean	20.96	31.15	39.04	60.84	80.96	78.95	118.12	127.65	
S.D	0.803025	1.438117	1.427861	1.873365	2.420118	2.694457	3.674317	3.540173	
CoV	3.831224	4.616749	3.657432	3.079166	2.989276	3.412866	3.110665	2.773344	%

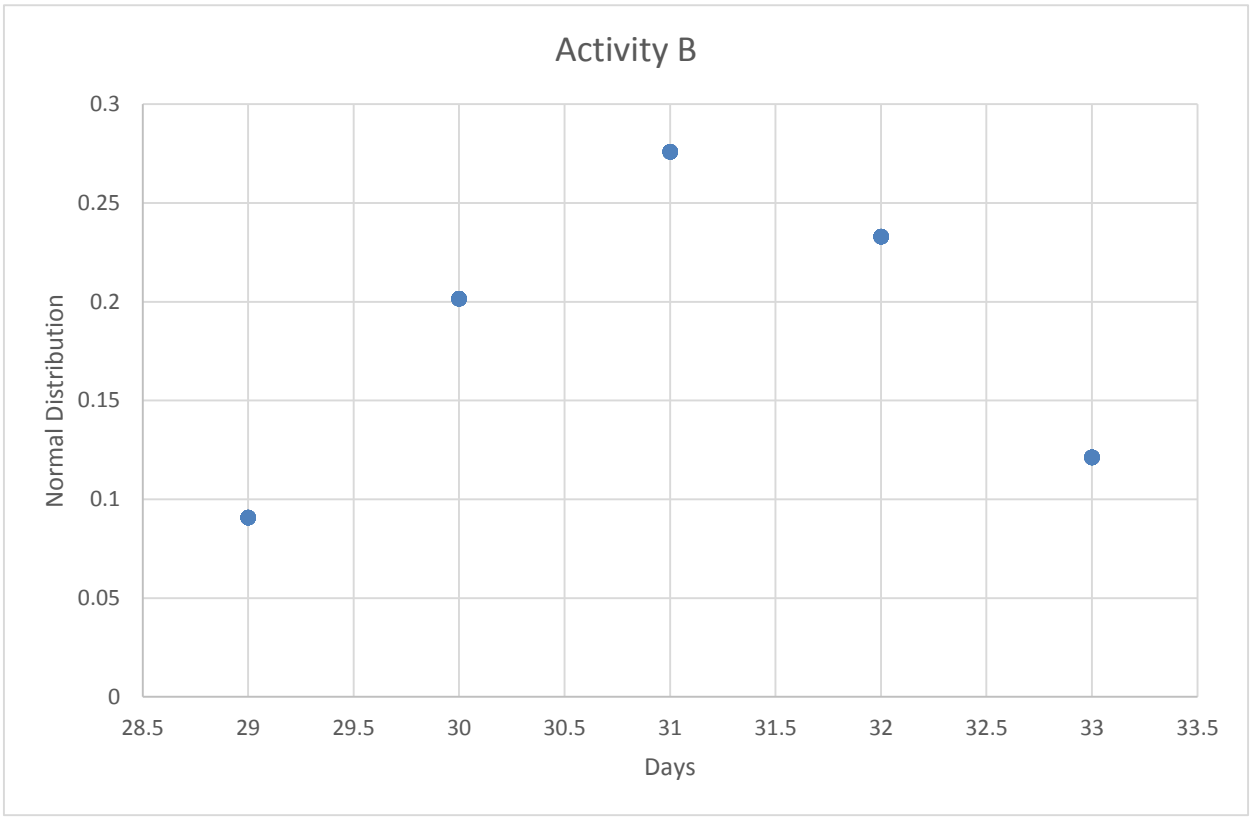
Input- Appendix 14

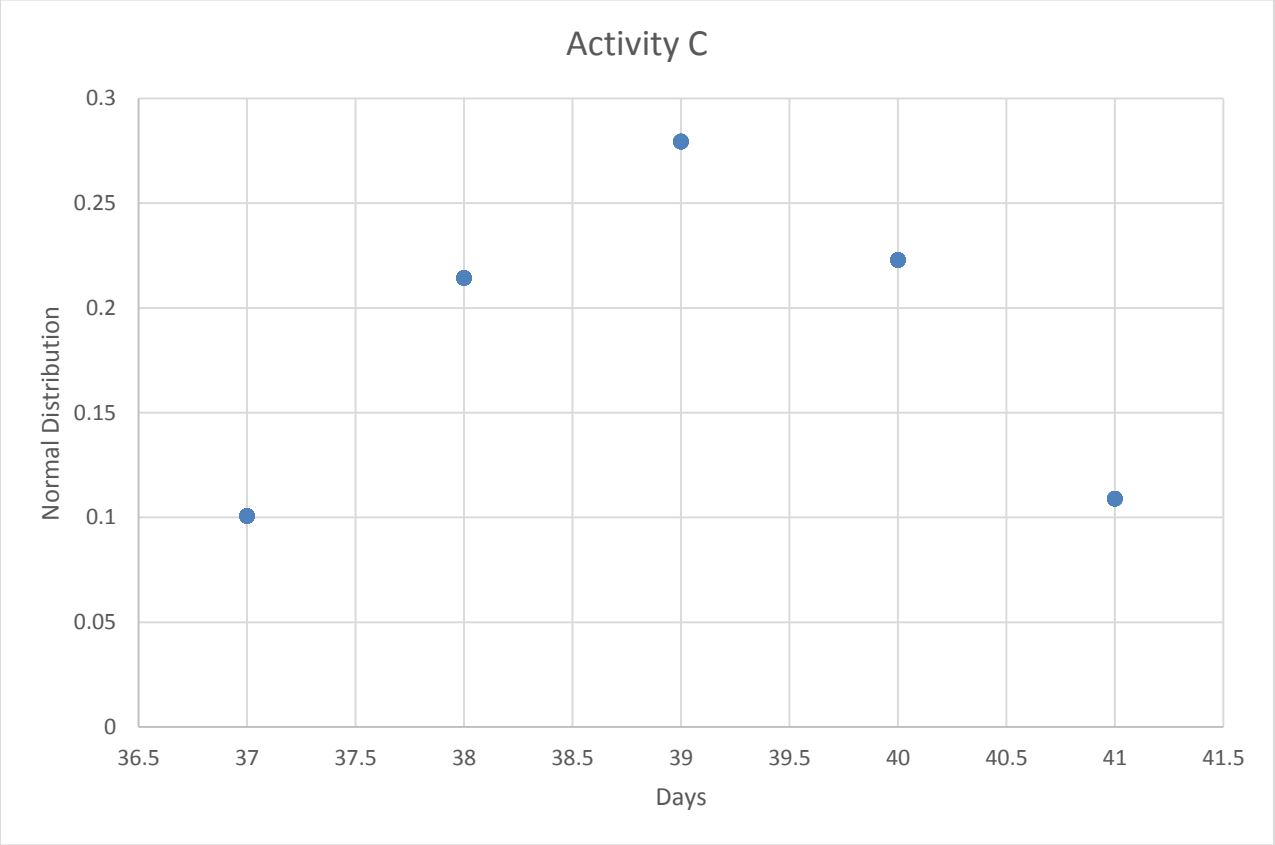
Output- Appendix 14.1

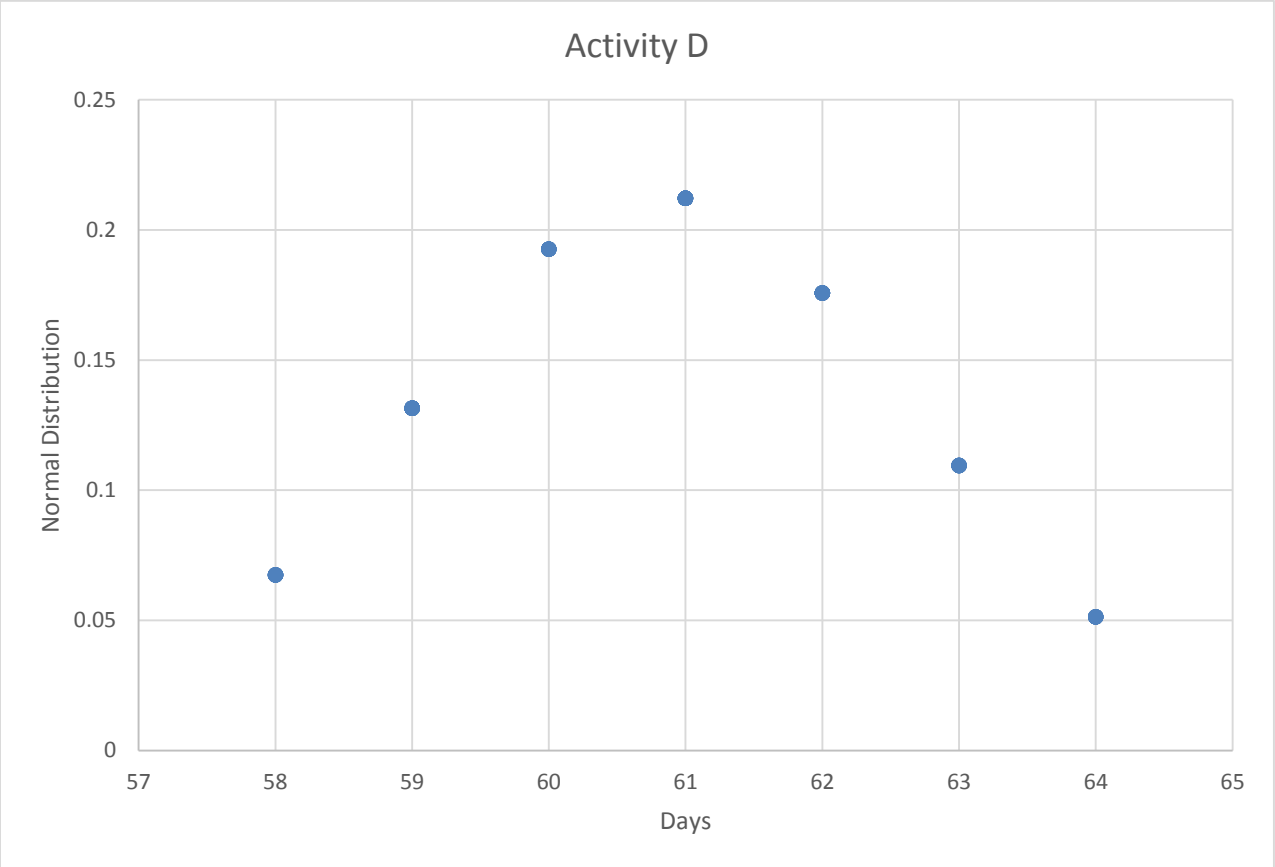
Normal Distribution Graph:

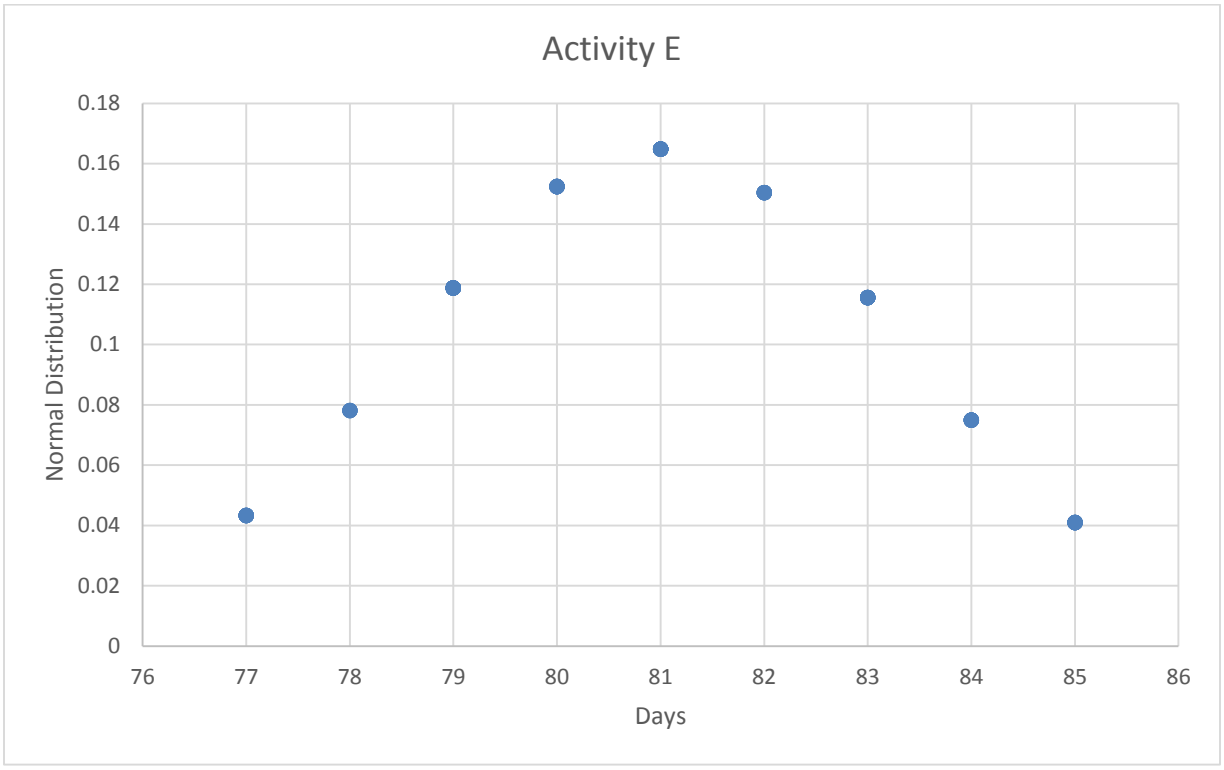
Input- Appendix 14.2

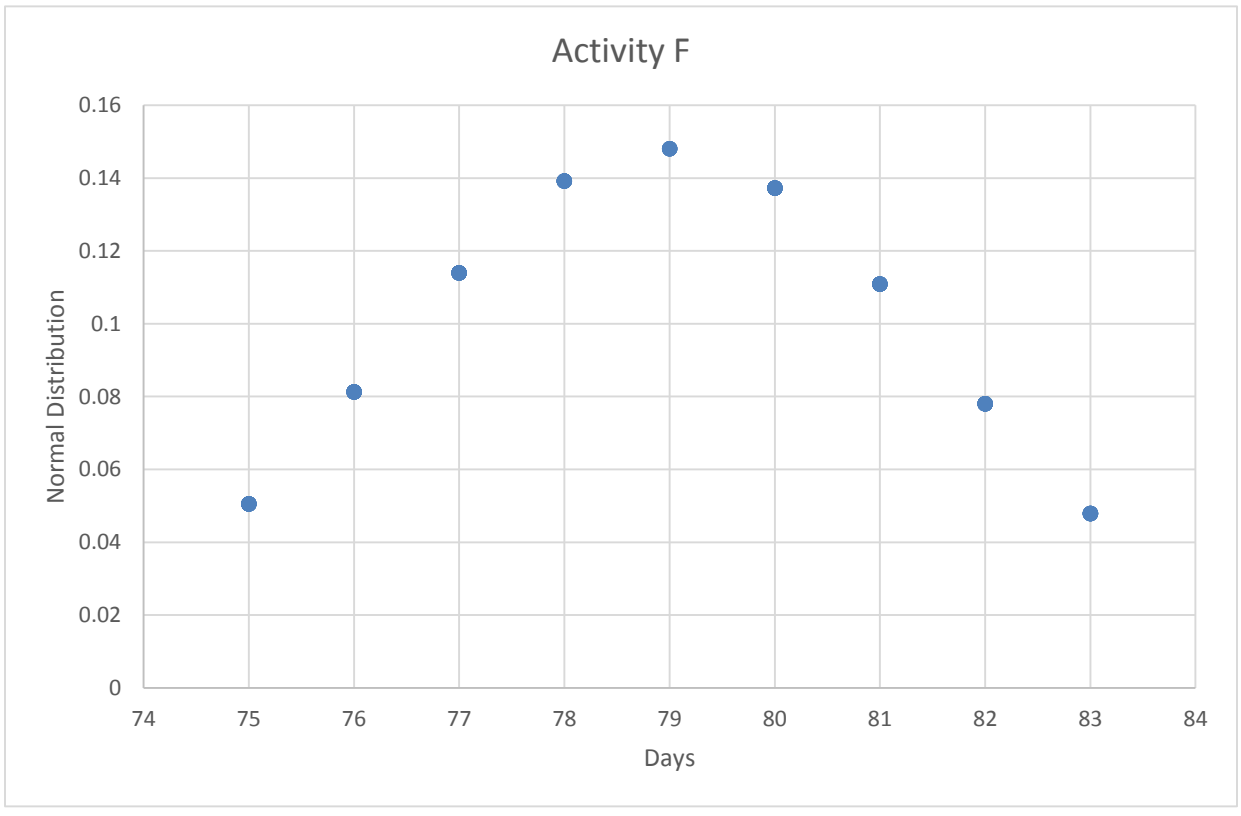


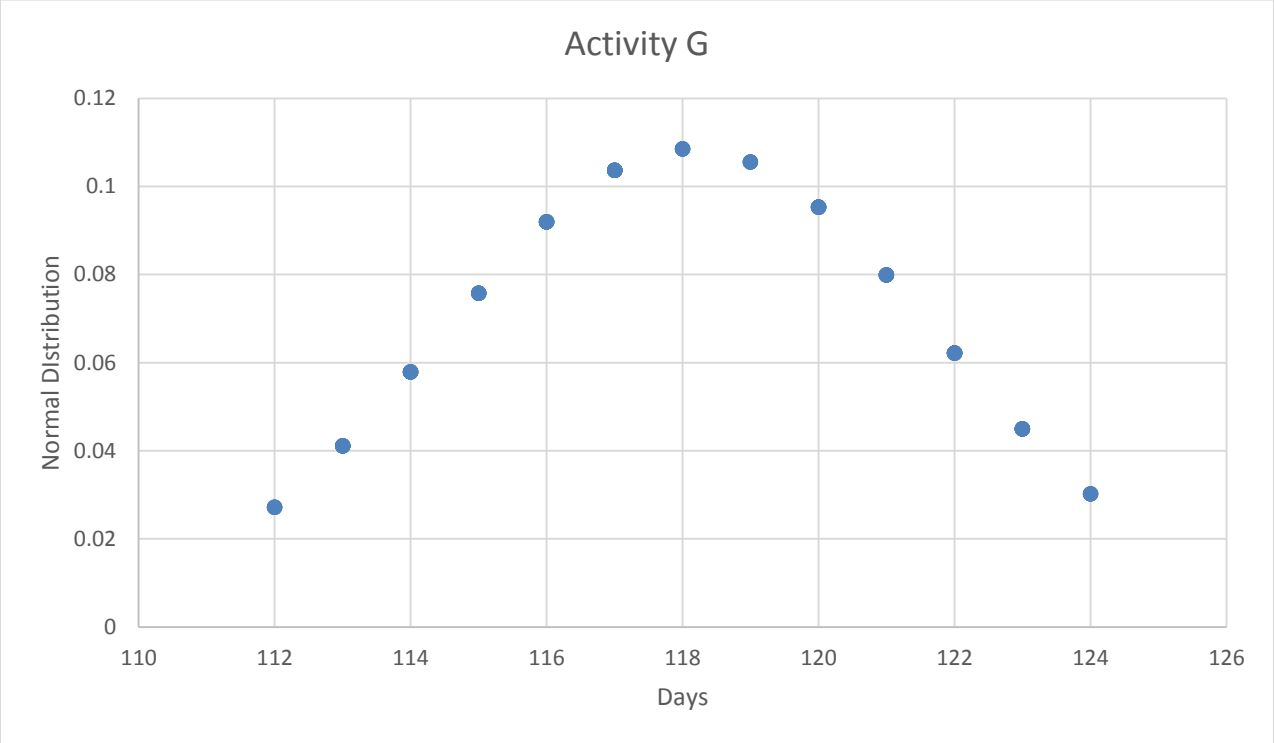


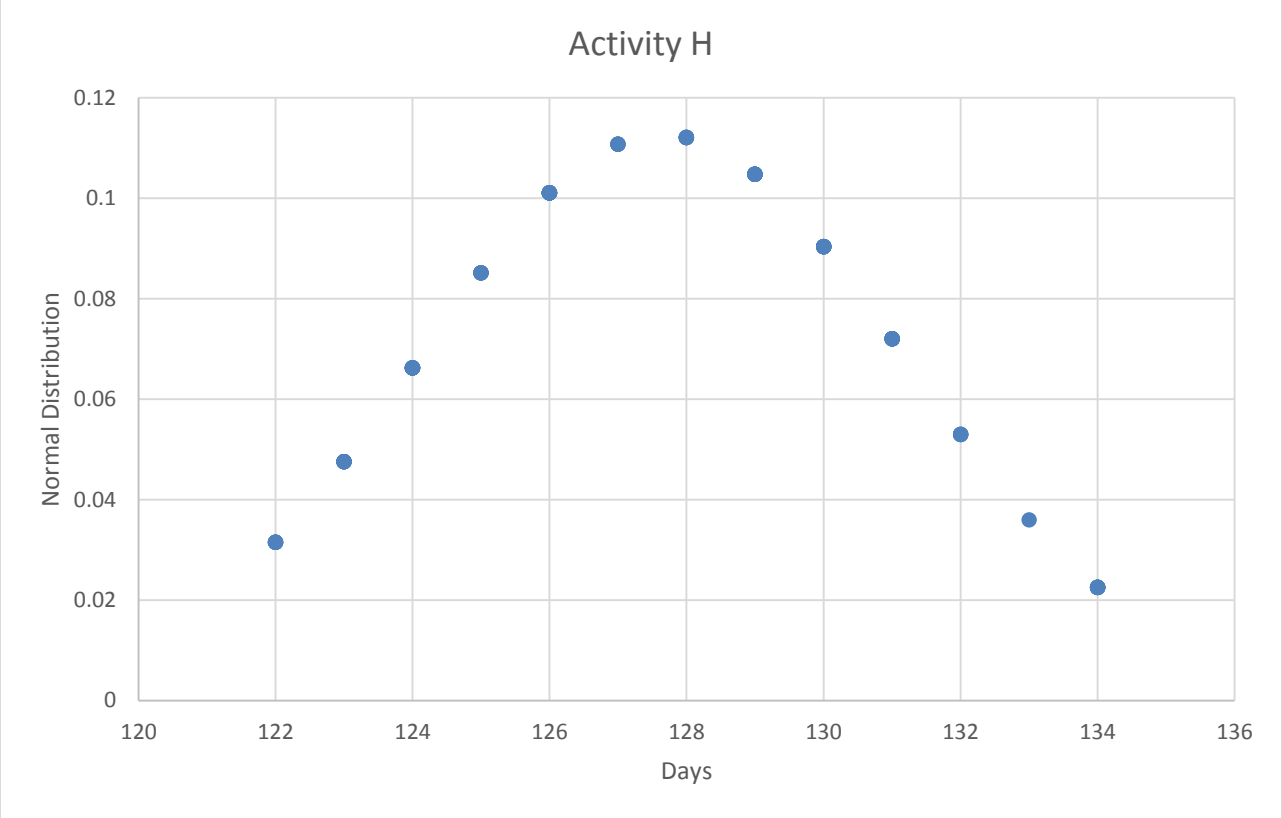

Activity C
0.3
0.25
0.2
0.15
0.1
0.05
0
Normal Distribution
36.5
37
37.5
38
38.5
39
39.5
40
40.5
41
41.5
Days


Activity D
0.25
0.2
0.15
0.1
0.05
0
Normal Distribution
57
58
59
60
61
62
63
64
65
Days


Activity E
Normal Distribution
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
76
77
78
79
80
81
82
83
84
85
86
Days


Activity F
Normal Distribution
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
74
75
76
77
78
79
80
81
82
83
84
Days


Activity G
Normal DIstribution
0.12
0.1
0.08
0.06
0.04
0.02
0
110
112
114
116
118
120
122
124
126
Days


Activity H
Normal Distribution
0.12
0.1
0.08
0.06
0.04
0.02
0
120
122
124
126
128
130
132
134
136
Days

Result:

From the above graphs it can be concluded that Activity A is the major delay factor in hilly road construction since the coefficient of variation of this activity is maximum in all of the above scenarios.

The Normal Distribution curves shown above also show the maximum peak for Activity A.

Conclusions

In hilly road construction project according to contractors views working in hill relative factor to delay the project in hilly road construction revealed that: delay in honoring payment certificates, bad weather conditions, unfavorable site conditions, consultant initiated variations, delay in instructions from consultants and difficulty in accessing bank credit are the most critical factors causing delay in road projects. In this research the main delay according to the all activity we find the activity which is more delay during hilly road construction is first activity (clearing and grubbing). The activity find by the use of the M.s excel. Using random number and calculating in primavera then it can find in this including the whole problem during project execution face the contractor or client. And the major delay is activity A.

.

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MODEL-1

Appendix 1

INPUT

SR.NO.	A	B	C	D	E	F	G	H
1	19	32	30	59	66	68	110	120
2	23	24	32	63	86	78	112	134
3	23	25	37	53	85	84	120	133
4	23	26	39	58	69	84	108	114
5	24	35	42	70	87	74	116	123
6	19	26	34	64	68	77	121	127
7	18	30	44	58	70	85	121	113
8	24	32	40	47	73	67	107	126
9	18	24	34	46	66	77	117	127
10	16	30	30	67	68	83	115	134
11	19	26	38	59	84	82	108	111
12	17	33	30	67	65	71	123	111
13	16	22	31	60	81	77	113	124
14	24	23	32	55	88	76	111	110
15	23	35	33	59	78	72	120	133
16	23	29	32	66	87	84	111	118
17	19	27	41	62	85	70	105	129
18	23	32	35	52	71	67	103	127
19	19	25	32	55	67	66	121	117
20	17	35	39	46	81	79	117	133
21	15	27	35	62	82	83	101	115
22	26	28	36	47	65	75	102	133
23	19	27	37	60	83	67	107	112
24	15	29	38	59	84	66	120	120
25	24	32	37	69	72	67	115	130
26	15	36	42	69	74	76	103	112
27	16	34	30	68	70	76	120	116
28	20	29	41	66	81	64	114	134
29	16	30	33	55	70	76	109	124
30	20	24	35	68	69	73	107	130
31	22	28	44	49	76	74	105	112
32	14	25	30	59	73	77	111	133
33	14	33	43	50	78	82	105	130
34	22	32	30	46	66	76	113	114
35	22	22	33	47	86	83	103	128
36	24	23	39	56	66	83	101	115
37	25	28	43	51	76	73	117	120
38	25	32	35	69	76	73	107	118
39	25	22	44	48	68	85	121	126
40	18	23	36	48	86	73	104	119
41	15	32	34	56	69	71	103	129
42	25	32	33	62	65	71	107	128

Appendix 1.1

OUTPUT

A	B	C	D	E	F	G	H
25	39	37	71	78	79	121	132
29	31	39	75	98	89	123	146
29	32	44	65	97	95	131	145
29	33	46	70	81	95	119	126
30	42	49	82	99	85	127	135
25	33	41	76	80	88	132	139
24	37	51	70	82	96	132	125
30	39	47	59	85	78	118	138
24	31	41	58	78	88	128	139
22	37	37	79	80	94	126	146
25	33	45	71	96	93	119	123
23	40	37	79	77	82	134	123
22	29	38	72	93	88	124	136
30	30	39	67	100	87	122	122
29	42	40	71	90	83	131	145
29	36	49	78	99	95	122	130
25	34	48	74	97	81	116	141
29	39	42	64	83	78	114	139
25	32	39	67	79	77	132	129
23	42	46	58	93	90	128	145
21	34	42	74	94	94	112	127
32	35	43	59	77	86	113	145
25	34	44	72	95	78	118	124
21	36	45	71	96	77	131	132
30	39	44	81	84	78	126	142
21	43	49	81	86	87	114	124
22	41	37	80	82	87	131	128
26	36	48	78	93	75	125	146
22	37	40	67	82	87	120	136
20	31	42	80	81	84	118	142
28	35	51	61	88	85	116	134
20	32	37	71	85	88	122	145
20	40	50	60	90	93	116	142
28	39	37	58	78	87	124	126
28	29	40	59	98	94	114	140
30	30	46	68	78	94	112	127
31	35	50	63	88	84	128	132
31	39	42	81	88	84	118	130
31	29	51	60	80	96	132	138
24	30	43	60	98	84	115	131
21	39	41	68	81	82	114	141
31	39	40	74	77	82	118	140

43	24	23	38	50	80	83	115	128
44	24	35	30	47	65	84	114	131
45	22	25	37	66	84	72	119	116
46	25	23	36	65	89	80	120	127
47	22	35	41	53	74	74	114	110
48	25	26	39	48	78	72	115	123
49	24	30	32	56	69	65	109	132
50	22	22	43	59	76	86	110	132
51	15	27	32	59	81	67	122	118
52	25	34	42	64	87	76	106	115
53	20	33	39	57	88	65	123	133
54	16	24	43	63	84	72	114	124
55	15	35	36	62	72	82	119	119
56	19	24	40	54	86	64	101	122
57	19	30	37	57	88	80	111	128
58	18	30	44	61	73	74	104	133
59	14	34	33	65	82	82	105	126
60	21	28	34	55	88	84	122	134
61	18	30	31	65	80	84	106	115
62	14	22	40	60	75	71	102	113
63	17	36	38	52	81	77	109	121
64	23	30	35	70	70	66	110	132
65	19	35	37	51	69	86	105	120
66	15	22	38	56	79	67	107	127
67	17	23	38	48	82	84	116	123
68	20	25	30	48	76	83	123	119
69	23	36	39	48	84	67	102	118
70	19	28	37	57	77	78	116	116
71	17	36	44	58	67	69	108	121
72	16	30	39	46	89	70	103	134
73	25	36	33	55	81	76	121	118
74	16	35	36	46	80	66	101	128
75	21	34	44	69	84	72	104	110
76	23	36	32	69	68	77	115	116
77	17	30	33	55	75	83	110	133
78	21	26	38	69	86	73	117	122
79	16	30	41	61	82	83	106	129
80	21	23	38	59	75	81	103	129
81	15	24	33	68	86	86	102	117
82	15	28	34	68	85	71	105	112
83	15	25	32	54	66	82	104	114
84	19	27	38	50	73	77	106	118
85	22	29	39	64	65	72	103	126
86	26	26	30	46	78	84	113	117
87	22	26	44	51	78	85	115	119
88	19	31	33	56	80	79	115	134
89	20	33	33	58	67	64	120	133

30	30	45	62	92	94	126	140
30	42	37	59	77	95	125	143
28	32	44	78	96	83	130	128
31	30	43	77	101	91	131	139
28	42	48	65	86	85	125	122
31	33	46	60	90	83	126	135
30	37	39	68	81	76	120	144
28	29	50	71	88	97	121	144
21	34	39	71	93	78	133	130
31	41	49	76	99	87	117	127
26	40	46	69	100	76	134	145
22	31	50	75	98	83	125	136
21	42	43	74	84	93	130	131
25	31	47	66	98	75	112	135
25	37	44	69	100	91	122	140
24	37	51	73	85	85	115	145
20	41	40	77	94	93	116	138
27	35	41	67	100	95	133	146
24	37	38	77	92	95	117	127
20	29	47	72	87	82	113	125
23	43	45	64	93	88	120	133
29	37	42	82	82	78	121	144
25	42	44	63	81	97	116	132
21	29	45	68	91	78	118	139
23	30	45	60	94	95	127	135
26	32	37	60	88	94	134	131
29	43	46	60	96	78	113	130
25	35	44	69	89	89	127	128
23	43	51	70	79	80	119	133
22	37	46	58	101	81	114	146
31	43	40	67	93	87	132	130
22	42	43	58	92	77	112	140
27	41	51	81	96	83	115	122
29	43	39	81	80	88	126	128
23	37	40	67	87	94	121	145
25	33	45	81	98	84	128	134
22	37	48	73	94	94	117	141
27	30	45	71	87	92	114	141
21	31	40	80	98	97	113	129
21	35	41	80	97	82	116	124
21	32	39	66	78	93	115	126
25	34	45	62	85	88	117	130
28	36	46	76	77	83	114	138
32	33	37	58	90	95	124	129
28	33	51	63	90	96	126	131
25	38	40	68	92	90	126	146
26	40	40	70	79	75	131	145

90	26	35	35	49	87	86	101	116
91	21	35	44	54	75	67	110	133
92	16	33	44	69	78	74	111	113
93	21	30	40	56	75	68	112	120
94	18	28	41	59	88	70	105	125
95	20	35	44	67	71	75	110	110
96	18	28	37	47	82	84	108	123
97	23	33	36	49	72	77	109	110
98	15	30	38	68	79	67	109	132
99	21	24	30	49	84	81	103	117
100	18	26	31	66	75	86	115	121

32	42	42	61	99	97	112	128
27	42	51	66	87	78	121	145
22	40	51	81	90	85	122	125
27	37	47	68	87	79	123	132
24	35	48	71	100	81	116	137
26	42	51	69	83	86	121	122
24	35	44	59	94	95	119	135
29	40	43	61	89	88	120	122
21	37	45	80	79	78	120	144
27	31	37	61	93	92	114	129
24	33	38	78	98	97	126	133

Appendix 1.2

A	ND	B	ND	C	ND	D	ND	E	ND
25	0.109644	39	0.072791	37	0.027631	71	0.052644	78	0.017604
29	0.073681	31	0.046702	39	0.050451	75	0.040802	98	0.02627
29	0.073681	32	0.05929	44	0.091066	65	0.044759	97	0.030562
29	0.073681	33	0.071432	46	0.079996	70	0.053617	81	0.029607
30	0.054773	42	0.036252	49	0.044504	82	0.012989	99	0.022178
25	0.109644	33	0.071432	41	0.074741	76	0.036586	80	0.025349
24	0.099429	37	0.08918	51	0.023181	70	0.053617	82	0.033962
30	0.054773	39	0.072791	47	0.069322	59	0.0198	85	0.046005
24	0.099429	31	0.046702	41	0.074741	58	0.01622	78	0.017604
22	0.064537	37	0.08918	37	0.027631	79	0.023655	80	0.025349
25	0.109644	33	0.071432	45	0.087611	71	0.052644	96	0.034918
23	0.083327	40	0.060798	37	0.027631	79	0.023655	77	0.014278
22	0.064537	29	0.024766	38	0.038325	72	0.050758	93	0.046741
30	0.054773	30	0.034911	39	0.050451	67	0.050804	100	0.018389
29	0.073681	42	0.036252	40	0.063032	71	0.052644	90	0.053192
29	0.073681	36	0.091257	49	0.044504	78	0.027857	99	0.022178
25	0.109644	34	0.081674	48	0.057014	74	0.044686	97	0.030562
29	0.073681	39	0.072791	42	0.084112	64	0.040884	83	0.038261
25	0.109644	32	0.05929	39	0.050451	67	0.050804	79	0.021315
23	0.083327	42	0.036252	46	0.079996	58	0.01622	93	0.046741
21	0.046193	34	0.081674	42	0.084112	74	0.044686	94	0.043183
32	0.023891	35	0.088622	43	0.089837	59	0.0198	77	0.014278
25	0.109644	34	0.081674	44	0.091066	72	0.050758	95	0.039183
21	0.046193	36	0.091257	45	0.087611	71	0.052644	96	0.034918
30	0.054773	39	0.072791	44	0.091066	81	0.016152	84	0.042335
21	0.046193	43	0.025879	49	0.044504	81	0.016152	86	0.049099
22	0.064537	41	0.048192	37	0.027631	80	0.019725	82	0.033962
26	0.111739	36	0.091257	48	0.057014	78	0.027857	93	0.046741
22	0.064537	37	0.08918	40	0.063032	67	0.050804	82	0.033962
20	0.030556	31	0.046702	42	0.084112	80	0.019725	81	0.029607
28	0.091599	35	0.088622	51	0.023181	61	0.027943	88	0.052982
20	0.030556	32	0.05929	37	0.027631	71	0.052644	85	0.046005
20	0.030556	40	0.060798	50	0.032969	60	0.023736	90	0.053192
28	0.091599	39	0.072791	37	0.027631	58	0.01622	78	0.017604
28	0.091599	29	0.024766	40	0.063032	59	0.0198	98	0.02627
30	0.054773	30	0.034911	46	0.079996	68	0.052672	78	0.017604
31	0.037629	35	0.088622	50	0.032969	63	0.036672	88	0.052982
31	0.037629	39	0.072791	42	0.084112	81	0.016152	88	0.052982
31	0.037629	29	0.024766	51	0.023181	60	0.023736	80	0.025349
24	0.099429	30	0.034911	43	0.089837	60	0.023736	98	0.02627
21	0.046193	39	0.072791	41	0.074741	68	0.052672	81	0.029607
31	0.037629	39	0.072791	40	0.063032	74	0.044686	77	0.014278

30	0.054773	30	0.034911	45	0.087611	62	0.032303	92	0.049687
30	0.054773	42	0.036252	37	0.027631	59	0.0198	77	0.014278
28	0.091599	32	0.05929	44	0.091066	78	0.027857	96	0.034918
31	0.037629	30	0.034911	43	0.089837	77	0.032215	101	0.014974
28	0.091599	42	0.036252	48	0.057014	65	0.044759	86	0.049099
31	0.037629	33	0.071432	46	0.079996	60	0.023736	90	0.053192
30	0.054773	37	0.08918	39	0.050451	68	0.052672	81	0.029607
28	0.091599	29	0.024766	50	0.032969	71	0.052644	88	0.052982
21	0.046193	34	0.081674	39	0.050451	71	0.052644	93	0.046741
31	0.037629	41	0.048192	49	0.044504	76	0.036586	99	0.022178
26	0.111739	40	0.060798	46	0.079996	69	0.053627	100	0.018389
22	0.064537	31	0.046702	50	0.032969	75	0.040802	98	0.02627
21	0.046193	42	0.036252	43	0.089837	74	0.044686	84	0.042335
25	0.109644	31	0.046702	47	0.069322	66	0.04812	98	0.02627
25	0.109644	37	0.08918	44	0.091066	69	0.053627	100	0.018389
24	0.099429	37	0.08918	51	0.023181	73	0.048059	85	0.046005
20	0.030556	41	0.048192	40	0.063032	77	0.032215	94	0.043183
27	0.105238	35	0.088622	41	0.074741	67	0.050804	100	0.018389
24	0.099429	37	0.08918	38	0.038325	77	0.032215	92	0.049687
20	0.030556	29	0.024766	47	0.069322	72	0.050758	87	0.051465
23	0.083327	43	0.025879	45	0.087611	64	0.040884	93	0.046741
29	0.073681	37	0.08918	42	0.084112	82	0.012989	82	0.033962
25	0.109644	42	0.036252	44	0.091066	63	0.036672	81	0.029607
21	0.046193	29	0.024766	45	0.087611	68	0.052672	91	0.051875
23	0.083327	30	0.034911	45	0.087611	60	0.023736	94	0.043183
26	0.111739	32	0.05929	37	0.027631	60	0.023736	88	0.052982
29	0.073681	43	0.025879	46	0.079996	60	0.023736	96	0.034918
25	0.109644	35	0.088622	44	0.091066	69	0.053627	89	0.053568
23	0.083327	43	0.025879	51	0.023181	70	0.053617	79	0.021315
22	0.064537	37	0.08918	46	0.079996	58	0.01622	101	0.014974
31	0.037629	43	0.025879	40	0.063032	67	0.050804	93	0.046741
22	0.064537	42	0.036252	43	0.089837	58	0.01622	92	0.049687
27	0.105238	41	0.048192	51	0.023181	81	0.016152	96	0.034918
29	0.073681	43	0.025879	39	0.050451	81	0.016152	80	0.025349
23	0.083327	37	0.08918	40	0.063032	67	0.050804	87	0.051465
25	0.109644	33	0.071432	45	0.087611	81	0.016152	98	0.02627
22	0.064537	37	0.08918	48	0.057014	73	0.048059	94	0.043183
27	0.105238	30	0.034911	45	0.087611	71	0.052644	87	0.051465
21	0.046193	31	0.046702	40	0.063032	80	0.019725	98	0.02627
21	0.046193	35	0.088622	41	0.074741	80	0.019725	97	0.030562
21	0.046193	32	0.05929	39	0.050451	66	0.04812	78	0.017604
25	0.109644	34	0.081674	45	0.087611	62	0.032303	85	0.046005
28	0.091599	36	0.091257	46	0.079996	76	0.036586	77	0.014278
32	0.023891	33	0.071432	37	0.027631	58	0.01622	90	0.053192
28	0.091599	33	0.071432	51	0.023181	63	0.036672	90	0.053192
25	0.109644	38	0.082706	40	0.063032	68	0.052672	92	0.049687
26	0.111739	40	0.060798	40	0.063032	70	0.053617	79	0.021315

32	0.023891	42	0.036252	42	0.084112	61	0.027943	99	0.022178
27	0.105238	42	0.036252	51	0.023181	66	0.04812	87	0.051465
22	0.064537	40	0.060798	51	0.023181	81	0.016152	90	0.053192
27	0.105238	37	0.08918	47	0.069322	68	0.052672	87	0.051465
24	0.099429	35	0.088622	48	0.057014	71	0.052644	100	0.018389
26	0.111739	42	0.036252	51	0.023181	69	0.053627	83	0.038261
24	0.099429	35	0.088622	44	0.091066	59	0.0198	94	0.043183
29	0.073681	40	0.060798	43	0.089837	61	0.027943	89	0.053568
21	0.046193	37	0.08918	45	0.087611	80	0.019725	79	0.021315
27	0.105238	31	0.046702	37	0.027631	61	0.027943	93	0.046741
24	0.099429	33	0.071432	38	0.038325	78	0.027857	98	0.02627

F	ND	G	ND	H	ND
79	0.030342	121	0.060669	132	0.049521
89	0.056797	123	0.060018	146	0.017443
95	0.027807	131	0.022499	145	0.021079
95	0.027807	119	0.055836	126	0.02684
85	0.058049	127	0.04433	135	0.052997
88	0.059086	132	0.017909	139	0.045304
96	0.0228	132	0.017909	125	0.022782
78	0.025151	118	0.051714	138	0.04838
88	0.059086	128	0.038756	139	0.045304
94	0.033152	126	0.04953	146	0.017443
93	0.038637	119	0.055836	123	0.015567
82	0.046485	134	0.010576	123	0.015567
88	0.059086	124	0.057632	136	0.052327
87	0.060088	122	0.061054	122	0.012532
83	0.051208	131	0.022499	145	0.021079
95	0.027807	122	0.061054	130	0.043331
81	0.04125	116	0.041348	141	0.037675
78	0.025151	114	0.030099	139	0.045304
77	0.02038	132	0.017909	129	0.039473
90	0.053369	128	0.038756	145	0.021079
94	0.033152	112	0.019949	127	0.031066
86	0.059734	113	0.024793	145	0.021079
78	0.025151	118	0.051714	124	0.018999
77	0.02038	131	0.022499	132	0.049521
78	0.025151	126	0.04953	142	0.033458
87	0.060088	114	0.030099	124	0.018999
87	0.060088	131	0.022499	128	0.035329
75	0.0125	125	0.054058	146	0.017443
87	0.060088	120	0.058888	136	0.052327
84	0.055144	118	0.051714	142	0.033458
85	0.058049	116	0.041348	134	0.052735
88	0.059086	122	0.061054	145	0.021079
93	0.038637	116	0.041348	142	0.033458
87	0.060088	124	0.057632	126	0.02684
94	0.033152	114	0.030099	140	0.04168
94	0.033152	112	0.019949	127	0.031066
84	0.055144	128	0.038756	132	0.049521
84	0.055144	118	0.051714	130	0.043331
96	0.0228	132	0.017909	138	0.04838
84	0.055144	115	0.035694	131	0.046734
82	0.046485	114	0.030099	141	0.037675
82	0.046485	118	0.051714	140	0.04168

94	0.033152	126	0.04953	140	0.04168
95	0.027807	125	0.054058	143	0.029194
83	0.051208	130	0.027611	128	0.035329
91	0.049022	131	0.022499	139	0.045304
85	0.058049	125	0.054058	122	0.012532
83	0.051208	126	0.04953	135	0.052997
76	0.016143	120	0.058888	144	0.025026
97	0.018275	121	0.060669	144	0.025026
78	0.025151	133	0.013925	130	0.043331
87	0.060088	117	0.046787	127	0.031066
76	0.016143	134	0.010576	145	0.021079
83	0.051208	125	0.054058	136	0.052327
93	0.038637	130	0.027611	131	0.046734
75	0.0125	112	0.019949	135	0.052997
91	0.049022	122	0.061054	140	0.04168
85	0.058049	115	0.035694	145	0.021079
93	0.038637	116	0.041348	138	0.04838
95	0.027807	133	0.013925	146	0.017443
95	0.027807	117	0.046787	127	0.031066
82	0.046485	113	0.024793	125	0.022782
88	0.059086	120	0.058888	133	0.051556
78	0.025151	121	0.060669	144	0.025026
97	0.018275	116	0.041348	132	0.049521
78	0.025151	118	0.051714	139	0.045304
95	0.027807	127	0.04433	135	0.052997
94	0.033152	134	0.010576	131	0.046734
78	0.025151	113	0.024793	130	0.043331
89	0.056797	127	0.04433	128	0.035329
80	0.035782	119	0.055836	133	0.051556
81	0.04125	114	0.030099	146	0.017443
87	0.060088	132	0.017909	130	0.043331
77	0.02038	112	0.019949	140	0.04168
83	0.051208	115	0.035694	122	0.012532
88	0.059086	126	0.04953	128	0.035329
94	0.033152	121	0.060669	145	0.021079
84	0.055144	128	0.038756	134	0.052735
94	0.033152	117	0.046787	141	0.037675
92	0.044018	114	0.030099	141	0.037675
97	0.018275	113	0.024793	129	0.039473
82	0.046485	116	0.041348	124	0.018999
93	0.038637	115	0.035694	126	0.02684
88	0.059086	117	0.046787	130	0.043331
83	0.051208	114	0.030099	138	0.04838
95	0.027807	124	0.057632	129	0.039473
96	0.0228	126	0.04953	131	0.046734
90	0.053369	126	0.04953	146	0.017443
75	0.0125	131	0.022499	145	0.021079

97	0.018275	112	0.019949	128	0.035329
78	0.025151	121	0.060669	145	0.021079
85	0.058049	122	0.061054	125	0.022782
79	0.030342	123	0.060018	132	0.049521
81	0.04125	116	0.041348	137	0.050761
86	0.059734	121	0.060669	122	0.012532
95	0.027807	119	0.055836	135	0.052997
88	0.059086	120	0.058888	122	0.012532
78	0.025151	120	0.058888	144	0.025026
92	0.044018	114	0.030099	129	0.039473
97	0.018275	126	0.04953	133	0.051556

Mean	25.74	36.1	43.76	69	89.1	86.76	121.77	134.78
S.D	3.561	4.37	4.374213	7.4	7.45	6.634955	6.530202	7.524479
CoV %	**13.83**	**12.1**	**9.995916**	**11**	**8.36**	**7.647481**	**5.362734**	**5.582786**

MODEL-2

	Appendix 2	Appendix 2.1	Appendix 2.2
SR.NO.	INPUT A	OUTPUT	ND
1	15	21	0.051029872
2	19	25	0.101845278
3	22	28	0.084889928
4	14	20	0.03633904
5	26	32	0.026172615
6	19	25	0.101845278
7	21	27	0.096424303
8	17	23	0.082379703
9	21	27	0.096424303
10	25	31	0.038819732
11	14	20	0.03633904
12	18	24	0.094703263
13	21	27	0.096424303
14	16	22	0.06703579
15	26	32	0.026172615
16	14	20	0.03633904
17	15	21	0.051029872
18	15	21	0.051029872
19	19	25	0.101845278
20	25	31	0.038819732
21	14	20	0.03633904
22	23	29	0.069912858
23	20	26	0.102458522
24	23	29	0.069912858
25	26	32	0.026172615
26	24	30	0.053862831
27	18	24	0.094703263
28	18	24	0.094703263
29	24	30	0.053862831
30	23	29	0.069912858
31	14	20	0.03633904
32	19	25	0.101845278
33	23	29	0.069912858
34	23	29	0.069912858
35	15	21	0.051029872
36	26	32	0.026172615
37	14	20	0.03633904
38	26	32	0.026172615
39	18	24	0.094703263
40	22	28	0.084889928
41	22	28	0.084889928
42	26	32	0.026172615

43	15	21	0.051029872
44	25	31	0.038819732
45	23	29	0.069912858
46	21	27	0.096424303
47	16	22	0.06703579
48	25	31	0.038819732
49	17	23	0.082379703
50	23	29	0.069912858
51	19	25	0.101845278
52	19	25	0.101845278
53	18	24	0.094703263
54	17	23	0.082379703
55	20	26	0.102458522
56	15	21	0.051029872
57	17	23	0.082379703
58	18	24	0.094703263
59	17	23	0.082379703
60	18	24	0.094703263
61	20	26	0.102458522
62	21	27	0.096424303
63	19	25	0.101845278
64	22	28	0.084889928
65	16	22	0.06703579
66	17	23	0.082379703
67	26	32	0.026172615
68	26	32	0.026172615
69	24	30	0.053862831
70	22	28	0.084889928
71	14	20	0.03633904
72	18	24	0.094703263
73	14	20	0.03633904
74	17	23	0.082379703
75	18	24	0.094703263
76	25	31	0.038819732
77	20	26	0.102458522
78	14	20	0.03633904
79	24	30	0.053862831
80	23	29	0.069912858
81	19	25	0.101845278
82	20	26	0.102458522
83	19	25	0.101845278
84	21	27	0.096424303
85	15	21	0.051029872
86	15	21	0.051029872
87	14	20	0.03633904
88	14	20	0.03633904
89	20	26	0.102458522

90	16	22	0.06703579
91	19	25	0.101845278
92	14	20	0.03633904
93	20	26	0.102458522
94	25	31	0.038819732
95	23	29	0.069912858
96	17	23	0.082379703
97	14	20	0.03633904
98	24	30	0.053862831
99	19	25	0.101845278
100	25	31	0.038819732

Mean	25.59
S.D	3.871927
Cov%	15.13062

MODEL-3

SR.NO.	Appendix 3 INPUT B	Appendix 3.1 OUTPUT	Appendix 3.2 ND
1	22	29	0.02652127
2	35	42	0.030340864
3	28	35	0.094399113
4	35	42	0.030340864
5	24	31	0.050965002
6	23	30	0.037837201
7	28	35	0.094399113
8	23	30	0.037837201
9	33	40	0.055940466
10	30	37	0.090988409
11	33	40	0.055940466
12	24	31	0.050965002
13	32	39	0.069681535
14	34	41	0.042399704
15	27	34	0.088206663
16	36	43	0.020498469
17	25	32	0.064811706
18	33	40	0.055940466
19	31	38	0.081947877
20	25	32	0.064811706
21	34	41	0.042399704
22	25	32	0.064811706
23	31	38	0.081947877
24	32	39	0.069681535
25	25	32	0.064811706
26	34	41	0.042399704
27	29	36	0.095381206
28	35	42	0.030340864
29	24	31	0.050965002
30	26	33	0.077814985
31	28	35	0.094399113
32	22	29	0.02652127
33	26	33	0.077814985
34	24	31	0.050965002
35	27	34	0.088206663
36	30	37	0.090988409
37	35	42	0.030340864
38	33	40	0.055940466
39	31	38	0.081947877
40	29	36	0.095381206
41	28	35	0.094399113
42	22	29	0.02652127

43	34	41	0.042399704
44	32	39	0.069681535
45	28	35	0.094399113
46	29	36	0.095381206
47	29	36	0.095381206
48	24	31	0.050965002
49	34	41	0.042399704
50	29	36	0.095381206
51	33	40	0.055940466
52	29	36	0.095381206
53	26	33	0.077814985
54	27	34	0.088206663
55	34	41	0.042399704
56	27	34	0.088206663
57	30	37	0.090988409
58	22	29	0.02652127
59	24	31	0.050965002
60	23	30	0.037837201
61	33	40	0.055940466
62	35	42	0.030340864
63	31	38	0.081947877
64	27	34	0.088206663
65	23	30	0.037837201
66	22	29	0.02652127
67	34	41	0.042399704
68	28	35	0.094399113
69	28	35	0.094399113
70	22	29	0.02652127
71	32	39	0.069681535
72	30	37	0.090988409
73	23	30	0.037837201
74	32	39	0.069681535
75	27	34	0.088206663
76	30	37	0.090988409
77	29	36	0.095381206
78	34	41	0.042399704
79	25	32	0.064811706
80	23	30	0.037837201
81	32	39	0.069681535
82	31	38	0.081947877
83	31	38	0.081947877
84	23	30	0.037837201
85	27	34	0.088206663
86	31	38	0.081947877
87	23	30	0.037837201
88	33	40	0.055940466
89	36	43	0.020498469

90	25	32	0.064811706
91	26	33	0.077814985
92	24	31	0.050965002
93	36	43	0.020498469
94	27	34	0.088206663
95	23	30	0.037837201
96	32	39	0.069681535
97	31	38	0.081947877
98	32	39	0.069681535
99	25	32	0.064811706
100	27	34	0.088206663

Mean	35.68
S.D	4.170314
CoV	11.6881

SR.NO.	MODEL-4 Appendix 4 INPUT C	Appendix 4.1 OUTPUT	Appendix 4.2 ND
1	36	43	0.094858759
2	31	38	0.038360565
3	33	40	0.065544209
4	32	39	0.0516145
5	36	43	0.094858759
6	41	48	0.055228969
7	40	47	0.069087149
8	38	45	0.090883614
9	43	50	0.029671118
10	38	45	0.090883614
11	30	37	0.02690755
12	42	49	0.041668943
13	36	43	0.094858759
14	35	42	0.088856087
15	33	40	0.065544209
16	30	37	0.02690755
17	32	39	0.0516145
18	33	40	0.065544209
19	38	45	0.090883614
20	32	39	0.0516145
21	38	45	0.090883614
22	40	47	0.069087149
23	32	39	0.0516145
24	32	39	0.0516145
25	36	43	0.094858759
26	30	37	0.02690755
27	44	51	0.019940279
28	36	43	0.094858759
29	37	44	0.095574839
30	30	37	0.02690755
31	43	50	0.029671118
32	37	44	0.095574839
33	35	42	0.088856087
34	38	45	0.090883614
35	35	42	0.088856087
36	32	39	0.0516145
37	42	49	0.041668943
38	37	44	0.095574839
39	31	38	0.038360565
40	44	51	0.019940279
41	35	42	0.088856087
42	41	48	0.055228969
43	39	46	0.081564934

44	35	42	0.088856087
45	33	40	0.065544209
46	42	49	0.041668943
47	40	47	0.069087149
48	31	38	0.038360565
49	30	37	0.02690755
50	35	42	0.088856087
51	43	50	0.029671118
52	42	49	0.041668943
53	33	40	0.065544209
54	34	41	0.078554816
55	42	49	0.041668943
56	43	50	0.029671118
57	39	46	0.081564934
58	37	44	0.095574839
59	43	50	0.029671118
60	32	39	0.0516145
61	34	41	0.078554816
62	36	43	0.094858759
63	36	43	0.094858759
64	38	45	0.090883614
65	31	38	0.038360565
66	31	38	0.038360565
67	35	42	0.088856087
68	42	49	0.041668943
69	36	43	0.094858759
70	34	41	0.078554816
71	41	48	0.055228969
72	38	45	0.090883614
73	35	42	0.088856087
74	43	50	0.029671118
75	44	51	0.019940279
76	42	49	0.041668943
77	40	47	0.069087149
78	35	42	0.088856087
79	33	40	0.065544209
80	39	46	0.081564934
81	40	47	0.069087149
82	37	44	0.095574839
83	38	45	0.090883614
84	43	50	0.029671118
85	33	40	0.065544209
86	38	45	0.090883614
87	36	43	0.094858759
88	44	51	0.019940279
89	31	38	0.038360565
90	33	40	0.065544209

91	39	46	0.081564934
92	37	44	0.095574839
93	31	38	0.038360565
94	33	40	0.065544209
95	35	42	0.088856087
96	34	41	0.078554816
97	40	47	0.069087149
98	34	41	0.078554816
99	33	40	0.065544209
100	44	51	0.019940279

Mean	43.63
S.D	4.157639
CoV	9.529312

MODEL-5

SR.NO.	Appendix 5 INPUT D	Appendix 5.1 OUTPUT	Appendix 5.2 ND
1	68	80	0.020232159
2	56	68	0.051597329
3	50	62	0.032175078
4	68	80	0.020232159
5	47	59	0.02008472
6	57	69	0.052522023
7	51	63	0.036358974
8	53	65	0.044066317
9	49	61	0.02798109
10	52	64	0.040377616
11	63	75	0.040532606
12	56	68	0.051597329
13	70	82	0.013564274
14	68	80	0.020232159
15	67	79	0.024072468
16	68	80	0.020232159
17	61	73	0.047377124
18	50	62	0.032175078
19	47	59	0.02008472
20	69	81	0.016710939
21	47	59	0.02008472
22	69	81	0.016710939
23	48	60	0.023913695
24	60	72	0.049900664
25	62	74	0.044204664
26	58	70	0.052540319
27	66	78	0.028147254
28	51	63	0.036358974
29	62	74	0.044204664
30	53	65	0.044066317
31	67	79	0.024072468
32	55	67	0.049813841
33	56	68	0.051597329
34	59	71	0.051651269
35	52	64	0.040377616
36	56	68	0.051597329
37	61	73	0.047377124
38	64	76	0.036523971
39	48	60	0.023913695
40	50	62	0.032175078
41	62	74	0.044204664

42	51	63	0.036358974
43	68	80	0.020232159
44	70	82	0.013564274
45	57	69	0.052522023
46	46	58	0.016577609
47	50	62	0.032175078
48	48	60	0.023913695
49	64	76	0.036523971
50	52	64	0.040377616
51	57	69	0.052522023
52	52	64	0.040377616
53	60	72	0.049900664
54	53	65	0.044066317
55	46	58	0.016577609
56	61	73	0.047377124
57	67	79	0.024072468
58	65	77	0.03234361
59	69	81	0.016710939
60	46	58	0.016577609
61	52	64	0.040377616
62	58	70	0.052540319
63	55	67	0.049813841
64	46	58	0.016577609
65	65	77	0.03234361
66	47	59	0.02008472
67	54	66	0.047261758
68	64	76	0.036523971
69	49	61	0.02798109
70	65	77	0.03234361
71	69	81	0.016710939
72	53	65	0.044066317
73	69	81	0.016710939
74	59	71	0.051651269
75	53	65	0.044066317
76	52	64	0.040377616
77	58	70	0.052540319
78	58	70	0.052540319
79	58	70	0.052540319
80	66	78	0.028147254
81	70	82	0.013564274
82	63	75	0.040532606
83	55	57	0.01344668
84	47	59	0.02008472
85	58	70	0.052540319
86	47	59	0.02008472
87	65	77	0.03234361
88	70	82	0.013564274

89	60	72	0.049900664
90	61	73	0.047377124
91	46	58	0.016577609
92	60	72	0.049900664
93	66	78	0.028147254
94	63	75	0.040532606
95	51	63	0.036358974
96	57	69	0.052522023
97	61	73	0.047377124
98	55	67	0.049813841
99	53	65	0.044066317
100	46	58	0.016577609

Mean	69.52
S.D	7.577852
CoV	10.90025

MODEL-6

SR.NO.	Appendix 6 INPUT E	Appendix 6.1 OUTPUT	Appendix 6.2 ND
1	80	92	0.050831662
2	82	94	0.043835814
3	76	88	0.054395043
4	87	99	0.021698043
5	77	89	0.05503022
6	65	77	0.013632584
7	83	95	0.039562004
8	77	89	0.05503022
9	87	99	0.021698043
10	78	90	0.054623273
11	67	79	0.020808299
12	67	79	0.020808299
13	71	83	0.038580503
14	82	94	0.043835814
15	66	78	0.01700357
16	88	100	0.017805022
17	83	95	0.039562004
18	88	100	0.017805022
19	81	93	0.047655653
20	86	98	0.025943776
21	79	91	0.053197196
22	80	92	0.050831662
23	72	84	0.042927647
24	80	92	0.050831662
25	72	84	0.042927647
26	86	98	0.025943776
27	88	100	0.017805022
28	75	87	0.052753581
29	72	84	0.042927647
30	68	80	0.024984323
31	76	88	0.054395043
32	81	93	0.047655653
33	88	100	0.017805022
34	81	93	0.047655653
35	68	80	0.024984323
36	66	78	0.01700357
37	66	78	0.01700357
38	87	99	0.021698043
39	65	77	0.013632584
40	66	78	0.01700357
41	83	95	0.039562004

42	70	82	0.034019916
43	83	95	0.039562004
44	66	78	0.01700357
45	85	97	0.030435493
46	81	93	0.047655653
47	80	92	0.050831662
48	79	91	0.053197196
49	72	84	0.042927647
50	83	95	0.039562004
51	68	80	0.024984323
52	89	101	0.014335043
53	77	89	0.05503022
54	68	80	0.024984323
55	66	88	0.054395043
56	78	90	0.054623273
57	79	91	0.053197196
58	80	92	0.050831662
59	83	95	0.039562004
60	68	80	0.024984323
61	78	90	0.054623273
62	70	82	0.034019916
63	70	82	0.034019916
64	69	81	0.029432906
65	73	85	0.046864158
66	71	83	0.038580503
67	88	100	0.017805022
68	82	94	0.043835814
69	79	91	0.053197196
70	82	94	0.043835814
71	85	97	0.030435493
72	68	80	0.024984323
73	72	84	0.042927647
74	88	100	0.017805022
75	74	86	0.050197156
76	65	77	0.013632584
77	74	86	0.050197156
78	81	93	0.047655653
79	75	87	0.052753581
80	75	87	0.052753581
81	88	100	0.017805022
82	77	89	0.05503022
83	85	97	0.030435493
84	81	93	0.047655653
85	81	93	0.047655653
86	84	96	0.035031766
87	69	81	0.029432906
88	65	77	0.013632584

89	79	91	0.053197196
90	81	93	0.047655653
91	81	93	0.047655653
92	65	77	0.013632584
93	87	99	0.021698043
94	71	83	0.038580503
95	79	91	0.053197196
96	79	91	0.053197196
97	65	77	0.013632584
98	78	90	0.054623273
99	89	101	0.014335043
100	73	85	0.046864158

Mean	89.11
S.D	7.248678
CoV%	8.134528

MODEL-7

SR.NO.	Appendix 7 INPUT F	Appendix 7.1 OUTPUT	Appendix 7.2 ND
1	69	80	0.038192806
2	67	78	0.028542576
3	65	76	0.019683911
4	66	77	0.023942194
5	71	82	0.047160306
6	68	79	0.033350245
7	78	89	0.052405171
8	84	95	0.0262071
9	85	96	0.021763468
10	76	87	0.05622194
11	69	80	0.038192806
12	85	96	0.021763468
13	81	92	0.040565009
14	81	92	0.040565009
15	66	77	0.023942194
16	84	95	0.0262071
17	78	89	0.052405171
18	68	79	0.033350245
19	83	94	0.03093047
20	69	80	0.038192806
21	83	94	0.03093047
22	66	77	0.023942194
23	85	96	0.021763468
24	82	93	0.035779208
25	71	82	0.047160306
26	85	96	0.021763468
27	85	96	0.021763468
28	84	95	0.0262071
29	69	80	0.038192806
30	80	91	0.045076388
31	80	91	0.045076388
32	70	81	0.042868744
33	82	93	0.035779208
34	64	75	0.015861181
35	69	80	0.038192806
36	73	84	0.053737606
37	77	88	0.054827906
38	86	97	0.017713887
39	67	78	0.028542576
40	74	85	0.055660123
41	64	75	0.015861181

42	70	81	0.042868744
43	64	75	0.015861181
44	82	93	0.035779208
45	69	80	0.038192806
46	65	76	0.019683911
47	73	84	0.053737606
48	64	75	0.015861181
49	84	95	0.0262071
50	71	82	0.047160306
51	82	93	0.035779208
52	78	89	0.052405171
53	82	93	0.035779208
54	72	83	0.050849787
55	76	87	0.05622194
56	86	97	0.017713887
57	69	80	0.038192806
58	72	83	0.050849787
59	82	93	0.035779208
60	83	94	0.03093047
61	71	82	0.047160306
62	67	78	0.028542576
63	77	88	0.054827906
64	66	77	0.023942194
65	68	79	0.033350245
66	81	92	0.040565009
67	69	80	0.038192806
68	70	81	0.042868744
69	65	76	0.019683911
70	69	80	0.038192806
71	83	94	0.03093047
72	81	92	0.040565009
73	75	86	0.056504972
74	75	86	0.056504972
75	70	81	0.042868744
76	83	94	0.03093047
77	78	89	0.052405171
78	83	94	0.03093047
79	64	75	0.015861181
80	74	85	0.055660123
81	72	83	0.050849787
82	82	93	0.035779208
83	86	97	0.017713887
84	82	93	0.035779208
85	75	86	0.056504972
86	83	94	0.03093047
87	81	92	0.040565009
88	64	75	0.015861181

89	75	86	0.056504972
90	74	85	0.055660123
91	74	85	0.055660123
92	74	85	0.055660123
93	83	94	0.03093047
94	86	97	0.017713887
95	64	75	0.015861181
96	71	82	0.047160306
97	79	90	0.049093421
98	83	94	0.03093047
99	77	88	0.054827906
100	78	89	0.052405171

Mean	86.25
S.D	7.055874
CoV	8.180723

MODEL-8

SR.NO.	Appendix 8 INPUT G	Appendix 8.1 OUTPUT	Appendix 8.2 ND
1	104	115	0.025931392
2	102	113	0.016847343
3	119	130	0.037901516
4	110	121	0.055248487
5	103	114	0.02113688
6	123	134	0.017909331
7	122	133	0.022338832
8	117	128	0.048205657
9	107	118	0.041863302
10	116	127	0.052569268
11	115	126	0.056058481
12	112	123	0.059432274
13	123	134	0.017909331
14	101	112	0.013130988
15	120	131	0.032497434
16	123	134	0.017909331
17	114	125	0.05845561
18	104	115	0.025931392
19	119	130	0.037901516
20	106	117	0.036494055
21	104	115	0.025931392
22	121	132	0.027246896
23	115	126	0.056058481
24	115	126	0.056058481
25	122	133	0.022338832
26	111	122	0.057947357
27	119	130	0.037901516
28	109	120	0.05150894
29	123	134	0.017909331
30	117	128	0.048205657
31	123	134	0.017909331
32	118	129	0.043225453
33	109	120	0.05150894
34	116	127	0.052569268
35	104	115	0.025931392
36	105	116	0.031109013
37	115	126	0.056058481
38	111	122	0.057947357
39	116	127	0.052569268
40	122	133	0.022338832
41	102	113	0.016847343

42	104	115	0.025931392
43	108	119	0.046959159
44	114	125	0.05845561
45	105	126	0.056058481
46	116	127	0.052569268
47	114	125	0.05845561
48	119	130	0.037901516
49	104	115	0.025931392
50	104	115	0.025931392
51	117	128	0.048205657
52	116	127	0.052569268
53	119	130	0.037901516
54	106	117	0.036494055
55	123	134	0.017909331
56	114	125	0.05845561
57	119	130	0.037901516
58	111	122	0.057947357
59	114	125	0.05845561
60	117	128	0.048205657
61	114	125	0.05845561
62	102	113	0.016847343
63	113	124	0.059605528
64	106	117	0.036494055
65	101	112	0.013130988
66	101	112	0.013130988
67	115	126	0.056058481
68	121	132	0.027246896
69	115	126	0.056058481
70	106	117	0.036494055
71	113	124	0.059605528
72	103	114	0.02113688
73	105	116	0.031109013
74	107	118	0.041863302
75	116	127	0.052569268
76	121	132	0.027246896
77	110	121	0.055248487
78	117	128	0.048205657
79	119	130	0.037901516
80	121	132	0.027246896
81	111	122	0.057947357
82	114	125	0.05845561
83	116	127	0.052569268
84	113	124	0.059605528
85	102	113	0.016847343
86	115	126	0.056058481
87	117	128	0.048205657
88	120	131	0.032497434

89	103	114	0.02113688
90	111	122	0.057947357
91	111	122	0.057947357
92	104	115	0.025931392
93	115	126	0.056058481
94	116	127	0.052569268
95	120	131	0.032497434
96	108	119	0.046959159
97	107	118	0.041863302
98	103	114	0.02113688
99	101	112	0.013130988
100	119	130	0.037901516

Mean	123.63
S.D	6.682791
CoV	5.405477

MODEL-9

SR.NO.	Appendix 9 INPUT H	Appendix 9.1 OUTPUT	Appendix 9.2 ND
1	114	126	0.033407801
2	121	133	0.053967366
3	130	142	0.026736536
4	131	143	0.022564944
5	122	134	0.053710935
6	123	135	0.052485384
7	124	136	0.050356812
8	128	140	0.03552871
9	119	131	0.051570435
10	114	126	0.033407801
11	130	142	0.026736536
12	119	131	0.051570435
13	124	136	0.050356812
14	132	144	0.018698534
15	113	125	0.028991444
16	118	130	0.049045803
17	129	141	0.031104283
18	121	133	0.053967366
19	111	123	0.020665519
20	121	133	0.053967366
21	110	122	0.01697465
22	112	124	0.024702221
23	131	143	0.022564944
24	111	123	0.020665519
25	127	139	0.039845829
26	114	126	0.033407801
27	111	123	0.020665519
28	125	137	0.047437551
29	110	122	0.01697465
30	119	131	0.051570435
31	123	135	0.052485384
32	128	140	0.03552871
33	113	125	0.028991444
34	125	137	0.047437551
35	131	143	0.022564944
36	134	146	0.012153089
37	128	140	0.03552871
38	112	124	0.024702221
39	122	134	0.053710935
40	134	146	0.012153089
41	133	145	0.015213356

42	116	128	0.041989094
43	116	128	0.041989094
44	126	138	0.043876348
45	129	141	0.031104283
46	130	142	0.026736536
47	116	128	0.041989094
48	124	136	0.050356812
49	113	125	0.028991444
50	114	126	0.033407801
51	112	124	0.024702221
52	119	131	0.051570435
53	115	127	0.037798112
54	121	133	0.053967366
55	133	145	0.015213356
56	110	122	0.01697465
57	111	123	0.020665519
58	114	126	0.033407801
59	118	130	0.049045803
60	134	146	0.012153089
61	129	141	0.031104283
62	121	133	0.053967366
63	129	141	0.031104283
64	110	122	0.01697465
65	129	141	0.031104283
66	111	123	0.020665519
67	123	135	0.052485384
68	127	139	0.039845829
69	132	144	0.018698534
70	131	143	0.022564944
71	120	132	0.053240719
72	119	131	0.051570435
73	134	146	0.012153089
74	116	128	0.041989094
75	117	129	0.04579806
76	114	126	0.033407801
77	127	139	0.039845829
78	118	130	0.049045803
79	122	134	0.053710935
80	129	141	0.031104283
81	128	140	0.03552871
82	120	132	0.053240719
83	111	123	0.020665519
84	116	128	0.041989094
85	120	132	0.053240719
86	115	127	0.037798112
87	125	137	0.047437551
88	117	129	0.04579806

89	116	128	0.041989094
90	120	132	0.053240719
91	117	129	0.04579806
92	115	127	0.037798112
93	114	126	0.033407801
94	134	146	0.012153089
95	133	145	0.015213356
96	117	129	0.04579806
97	115	127	0.037798112
98	126	138	0.043876348
99	128	140	0.03552871
100	111	123	0.020665519

Mean	133.24
S.D	7.388388
CoV	5.545173

MODEL-10

Appendix 10

INPUT

A	B	C	D	E	F	G	H
17	33	39	63	74	53	141	87
15	28	37	42	91	57	106	149
20	33	35	75	54	96	127	106
22	24	41	65	63	78	96	110
23	30	30	43	97	52	93	90
26	30	38	53	88	79	127	133
21	26	42	41	76	58	144	109
23	26	34	70	62	55	142	103
23	29	44	54	92	79	116	122
24	23	43	75	98	82	91	140
20	38	31	68	99	82	98	111
20	27	47	70	59	95	85	145
23	29	38	68	86	62	115	145
21	24	44	49	100	83	87	128
20	34	44	59	77	57	103	92
22	26	42	46	76	88	127	145
21	35	43	47	60	98	78	124
21	34	46	62	70	79	145	145
19	36	30	61	87	86	136	129
21	20	30	43	66	72	133	130
23	25	31	69	81	63	118	154
17	27	43	69	88	87	125	91
22	36	37	64	57	72	110	116
23	22	41	50	96	59	110	88
17	22	35	41	81	53	125	129
24	33	38	56	84	91	122	142
14	34	47	72	76	89	144	130
17	34	28	71	85	94	113	97
18	23	42	75	57	76	132	134
16	34	42	48	60	82	123	123
21	31	39	53	89	63	94	151
25	31	43	45	87	83	87	116
22	38	37	53	77	93	117	121
25	23	48	48	80	95	106	123
21	35	38	74	83	93	117	136
15	31	41	70	94	52	139	89
15	37	48	44	100	74	98	104
23	23	28	65	63	67	134	102
23	33	34	66	57	91	82	110
16	32	47	75	57	96	143	141
22	33	28	61	92	95	87	153
26	31	34	54	73	81	131	106

Appendix 10.1

OUTPUT

SR.NO.	A	B	C	D	E	F	G	H
1	23	42	50	80	97	76	175	124
2	21	37	48	59	114	80	140	186
3	26	42	46	92	77	119	161	143
4	28	33	52	82	86	101	130	147
5	29	39	41	60	120	75	127	127
6	32	39	49	70	111	102	161	170
7	27	35	53	58	99	81	178	146
8	29	35	45	87	85	78	176	140
9	29	38	55	71	115	102	150	159
10	30	32	54	92	121	105	125	177
11	26	47	42	85	122	105	132	148
12	26	36	58	87	82	118	119	182
13	29	38	49	85	109	85	149	182
14	27	33	55	66	123	106	121	165
15	26	43	55	76	100	80	137	129
16	28	35	53	63	99	111	161	182
17	27	44	54	64	83	121	112	161
18	27	43	57	79	93	102	179	182
19	25	45	41	78	110	109	170	166
20	27	29	41	60	89	95	167	167
21	29	34	42	86	104	86	152	191
22	23	36	54	86	111	110	159	128
23	28	45	48	81	80	95	144	153
24	29	31	52	68	119	82	144	125
25	23	31	46	58	104	76	159	166
26	30	42	49	73	107	114	156	179
27	20	43	58	89	99	112	178	167
28	23	43	39	88	108	117	147	134
29	24	32	53	92	80	99	166	171
30	22	43	53	65	83	105	157	160
31	27	40	50	70	112	86	128	188
32	31	40	54	62	110	106	121	153
33	28	47	48	70	100	116	151	158
34	31	32	59	65	103	118	140	160
35	27	44	49	91	106	116	151	173
36	21	40	52	87	117	75	173	126
37	21	46	59	61	123	97	132	141
38	29	32	39	82	86	90	168	139
39	29	42	45	83	80	114	116	147
40	22	41	58	92	80	119	177	178
41	28	42	39	78	115	118	121	190
42	32	40	45	71	96	104	165	143

15	26	32	46	63	76	130	158
19	38	28	52	67	71	79	121
17	27	48	45	60	55	112	158
14	25	36	70	69	68	124	106
24	22	42	50	96	78	123	133
20	21	29	72	56	97	86	121
16	22	28	67	75	84	139	95
20	37	41	65	79	96	83	155
20	21	43	54	60	59	98	136
23	32	37	56	100	76	96	136
20	38	27	53	58	52	85	96
16	36	36	64	88	75	91	105
21	26	35	56	76	96	140	150
14	21	27	64	80	63	94	87
15	24	28	53	96	55	125	112
20	31	34	46	70	92	133	117
21	36	47	44	77	59	121	85
22	23	32	49	56	86	82	147
17	37	36	50	94	97	87	104
25	20	44	73	68	56	94	135
21	26	45	59	96	87	137	125
23	35	44	67	73	76	93	124
23	20	27	49	64	57	93	134
15	28	38	68	84	98	82	159
25	31	33	75	100	64	100	150
15	30	34	69	71	65	99	104
19	29	41	55	70	68	142	87
24	22	45	70	67	81	125	143
19	27	30	59	87	63	114	147
24	25	42	75	55	77	108	154
18	27	32	73	75	80	104	143
25	23	42	58	93	68	105	141
26	31	28	63	68	73	78	103
24	31	42	53	64	57	141	156
17	25	34	52	100	84	127	126
15	27	30	72	85	85	108	121
21	36	45	46	58	55	94	143
14	27	28	59	91	56	109	94
18	37	48	42	83	60	143	134
20	37	44	54	83	70	89	103
18	21	45	42	97	62	105	142
15	25	47	44	72	87	100	143
21	31	36	51	85	84	112	113
17	31	28	73	85	89	104	117
26	35	46	69	85	57	119	140
19	31	43	60	93	57	112	123
26	35	39	64	63	84	141	96

43	21	35	43	63	86	99	164	195
44	25	47	39	69	90	94	113	158
45	23	36	59	62	83	78	146	195
46	20	34	47	87	92	91	158	143
47	30	31	53	67	119	101	157	170
48	26	30	40	89	79	120	120	158
49	22	31	39	84	98	107	173	132
50	26	46	52	82	102	119	117	192
51	26	30	54	71	83	82	132	173
52	29	41	48	73	123	99	130	173
53	26	47	38	70	81	75	119	133
54	22	45	47	81	111	98	125	142
55	27	35	46	73	99	119	174	187
56	20	30	38	81	103	86	128	124
57	21	33	39	70	119	78	159	149
58	26	40	45	63	93	115	167	154
59	27	45	58	61	100	82	155	122
60	28	32	43	66	79	109	116	184
61	23	46	47	67	117	120	121	141
62	31	29	55	90	91	79	128	172
63	27	35	56	76	119	110	171	162
64	29	44	55	84	96	99	127	161
65	29	29	38	66	87	80	127	171
66	21	37	49	85	107	121	116	196
67	31	40	44	92	123	87	134	187
68	21	39	45	86	94	88	133	141
69	25	37	52	72	93	91	176	124
70	30	31	56	87	90	104	159	180
71	25	36	41	76	110	86	148	184
72	30	34	53	92	78	100	142	191
73	24	36	43	90	98	103	138	180
74	31	32	53	75	116	91	139	178
75	32	40	39	80	91	96	112	140
76	30	40	53	70	87	80	175	193
77	23	34	45	69	123	107	161	163
78	21	36	41	89	108	108	142	158
79	27	45	56	63	81	78	128	180
80	20	36	39	76	114	79	143	131
81	24	46	49	59	106	83	177	171
82	26	46	55	71	106	93	123	140
83	24	30	56	59	120	85	139	179
84	21	34	58	61	95	110	134	180
85	27	40	47	68	108	107	146	150
86	23	40	39	90	108	112	138	154
87	32	44	57	86	108	80	153	177
88	25	40	54	77	116	80	146	160
89	32	44	50	81	86	107	175	133

25	36	36	50	57	90	95	128
25	32	45	55	80	79	143	159
17	37	40	75	58	61	85	145
22	37	42	63	88	61	105	150
15	23	46	55	84	73	105	110
15	33	44	66	69	76	102	146
22	29	42	61	78	68	93	139
25	30	44	44	63	68	82	123
22	28	33	51	59	98	139	128
22	26	34	41	81	52	103	131
21	29	33	58	87	58	141	154

90	31	45	47	67	80	113	129	165
91	31	41	56	72	103	102	177	196
92	23	46	51	92	81	84	119	182
93	28	46	53	80	111	84	139	187
94	21	32	57	72	107	96	139	147
95	21	42	55	83	92	99	136	183
96	28	38	53	78	101	91	127	176
97	31	39	55	61	86	91	116	160
98	28	37	44	68	82	121	173	165
99	28	35	45	58	104	75	137	168
100	27	38	44	75	110	81	175	191

Mean	26	38.4	49	75	100.3	97.6	145.5	162.3
S.D	3.5	5.29	6.3	10	13.74	14.4	20.1	20.89
CoV	13	13.8	13	14	13.7	14.7	13.82	12.87

Appendix 10.2

A	ND	B	ND	C	ND	D	ND	E	ND
23	0.074089	42	0.059654	50	0.062792	80	0.034623	97	0.028199
21	0.03689	37	0.072853	48	0.062728	59	0.0111	114	0.017675
26	0.113974	42	0.059654	46	0.056614	92	0.011001	77	0.006888
28	0.100777	33	0.044964	52	0.056787	82	0.031317	86	0.016881
29	0.083791	39	0.074856	41	0.028096	60	0.012831	120	0.010401
32	0.029439	39	0.074856	49	0.063562	70	0.033178	111	0.021451
27	0.11166	35	0.061469	53	0.051985	58	0.009516	99	0.028898
29	0.083791	35	0.061469	45	0.051775	87	0.020791	85	0.015608
29	0.083791	38	0.075178	55	0.040372	71	0.034708	115	0.016395
30	0.064181	32	0.036451	54	0.046397	92	0.011001	121	0.009347
26	0.113974	47	0.020012	42	0.034006	85	0.025168	122	0.008355
26	0.113974	36	0.068125	58	0.02284	87	0.020791	82	0.01195
29	0.083791	38	0.075178	49	0.063562	85	0.025168	109	0.023769
27	0.11166	33	0.044964	55	0.040372	66	0.025299	123	0.007428
26	0.113974	43	0.051496	55	0.040372	76	0.037953	100	0.029022
28	0.100777	35	0.061469	53	0.051985	63	0.018768	99	0.028898
27	0.11166	44	0.042894	54	0.046397	64	0.020921	83	0.013132
27	0.11166	43	0.051496	57	0.028325	79	0.035913	93	0.0252
25	0.107173	45	0.034477	41	0.028096	78	0.036914	110	0.02264
27	0.11166	29	0.015677	41	0.028096	60	0.012831	89	0.02069
29	0.083791	34	0.05352	42	0.034006	86	0.022979	104	0.028002
23	0.074089	36	0.068125	54	0.046397	86	0.022979	111	0.021451
28	0.100777	45	0.034477	48	0.062728	81	0.033078	80	0.00974
29	0.083791	31	0.028514	52	0.056787	68	0.029502	119	0.011513
23	0.074089	31	0.028514	46	0.056614	58	0.009516	104	0.028002
30	0.064181	42	0.059654	49	0.063562	73	0.036964	107	0.025786
20	0.023017	43	0.051496	58	0.02284	89	0.016562	99	0.028898
23	0.074089	43	0.051496	39	0.017773	88	0.018641	108	0.024822
24	0.09284	32	0.036451	53	0.051985	92	0.011001	80	0.00974
22	0.054469	43	0.051496	53	0.051985	65	0.023111	83	0.013132
27	0.11166	40	0.071923	50	0.062792	70	0.033178	112	0.020217
31	0.045288	40	0.071923	54	0.046397	62	0.016684	110	0.02264
28	0.100777	47	0.020012	48	0.062728	70	0.033178	100	0.029022
31	0.045288	32	0.036451	59	0.017955	65	0.023111	103	0.028479
27	0.11166	44	0.042894	49	0.063562	91	0.012723	106	0.026645
21	0.03689	40	0.071923	52	0.056787	87	0.020791	117	0.013886
21	0.03689	46	0.02674	59	0.017955	61	0.014698	123	0.007428
29	0.083791	32	0.036451	39	0.017773	82	0.031317	86	0.016881
29	0.083791	42	0.059654	45	0.051775	83	0.029382	80	0.00974
22	0.054469	41	0.066681	58	0.02284	92	0.011001	80	0.00974
28	0.100777	42	0.059654	39	0.017773	78	0.036914	115	0.016395
32	0.029439	40	0.071923	45	0.051775	71	0.034708	96	0.027636

21	0.03689	35	0.061469	43	0.040126	63	0.018768	86	0.016881
25	0.107173	47	0.020012	39	0.017773	69	0.031428	90	0.021909
23	0.074089	36	0.068125	59	0.017955	62	0.016684	83	0.013132
20	0.023017	34	0.05352	47	0.060354	87	0.020791	92	0.024179
30	0.064181	31	0.028514	53	0.051985	67	0.027444	119	0.011513
26	0.113974	30	0.021523	40	0.022632	89	0.016562	79	0.008724
22	0.054469	31	0.028514	39	0.017773	84	0.027317	98	0.028622
26	0.113974	46	0.02674	52	0.056787	82	0.031317	102	0.028811
26	0.113974	30	0.021523	54	0.046397	71	0.034708	83	0.013132
29	0.083791	41	0.066681	48	0.062728	73	0.036964	123	0.007428
26	0.113974	47	0.020012	38	0.013608	70	0.033178	81	0.010817
22	0.054469	45	0.034477	47	0.060354	81	0.033078	111	0.021451
27	0.11166	35	0.061469	46	0.056614	73	0.036964	99	0.028898
20	0.023017	30	0.021523	38	0.013608	81	0.033078	103	0.028479
21	0.03689	33	0.044964	39	0.017773	70	0.033178	119	0.011513
26	0.113974	40	0.071923	45	0.051775	63	0.018768	93	0.0252
27	0.11166	45	0.034477	58	0.02284	61	0.014698	100	0.029022
28	0.100777	32	0.036451	43	0.040126	66	0.025299	79	0.008724
23	0.074089	46	0.02674	47	0.060354	67	0.027444	117	0.013886
31	0.045288	29	0.015677	55	0.040372	90	0.014582	91	0.023077
27	0.11166	35	0.061469	56	0.034248	76	0.037953	119	0.011513
29	0.083791	44	0.042894	55	0.040372	84	0.027317	96	0.027636
29	0.083791	29	0.015677	38	0.013608	66	0.025299	87	0.018161
21	0.03689	37	0.072853	49	0.063562	85	0.025168	107	0.025786
31	0.045288	40	0.071923	44	0.046162	92	0.011001	123	0.007428
21	0.03689	39	0.074856	45	0.051775	86	0.022979	94	0.026125
25	0.107173	37	0.072853	52	0.056787	72	0.035981	93	0.0252
30	0.064181	31	0.028514	56	0.034248	87	0.020791	90	0.021909
25	0.107173	36	0.068125	41	0.028096	76	0.037953	110	0.02264
30	0.064181	34	0.05352	53	0.051985	92	0.011001	78	0.007772
24	0.09284	36	0.068125	43	0.040126	90	0.014582	98	0.028622
31	0.045288	32	0.036451	53	0.051985	75	0.037963	116	0.015128
32	0.029439	40	0.071923	39	0.017773	80	0.034623	91	0.023077
30	0.064181	40	0.071923	53	0.051985	70	0.033178	87	0.018161
23	0.074089	34	0.05352	45	0.051775	69	0.031428	123	0.007428
21	0.03689	36	0.068125	41	0.028096	89	0.016562	108	0.024822
27	0.11166	45	0.034477	56	0.034248	63	0.018768	81	0.010817
20	0.023017	36	0.068125	39	0.017773	76	0.037953	114	0.017675
24	0.09284	46	0.02674	49	0.063562	59	0.0111	106	0.026645
26	0.113974	46	0.02674	55	0.040372	71	0.034708	106	0.026645
24	0.09284	30	0.021523	56	0.034248	59	0.0111	120	0.010401
21	0.03689	34	0.05352	58	0.02284	61	0.014698	95	0.026941
27	0.11166	40	0.071923	47	0.060354	68	0.029502	108	0.024822
23	0.074089	40	0.071923	39	0.017773	90	0.014582	108	0.024822
32	0.029439	44	0.042894	57	0.028325	86	0.022979	108	0.024822
25	0.107173	40	0.071923	54	0.046397	77	0.0376	116	0.015128
32	0.029439	44	0.042894	50	0.062792	81	0.033078	86	0.016881

31	0.045288	45	0.034477	47	0.060354	67	0.027444	80	0.00974
31	0.045288	41	0.066681	56	0.034248	72	0.035981	103	0.028479
23	0.074089	46	0.02674	51	0.060477	92	0.011001	81	0.010817
28	0.100777	46	0.02674	53	0.051985	80	0.034623	111	0.021451
21	0.03689	32	0.036451	57	0.028325	72	0.035981	107	0.025786
21	0.03689	42	0.059654	55	0.040372	83	0.029382	92	0.024179
28	0.100777	38	0.075178	53	0.051985	78	0.036914	101	0.028993
31	0.045288	39	0.074856	55	0.040372	61	0.014698	86	0.016881
28	0.100777	37	0.072853	44	0.046162	68	0.029502	82	0.01195
28	0.100777	35	0.061469	45	0.051775	58	0.009516	104	0.028002
27	0.11166	38	0.075178	44	0.046162	75	0.037963	110	0.02264

%

F	ND	G	ND	H	ND
76	0.008991	175	0.00674	124	0.003544
80	0.013131	140	0.019129	186	0.010056
119	0.009161	161	0.01472	143	0.012441
101	0.026966	130	0.014766	147	0.014585
75	0.008081	127	0.013018	127	0.004565
102	0.026461	161	0.01472	170	0.017857
81	0.014262	178	0.005353	146	0.014065
78	0.010971	176	0.006257	140	0.01078
102	0.026461	150	0.019348	159	0.018856
105	0.024288	125	0.011823	177	0.01493
105	0.024288	132	0.015862	148	0.015089
118	0.010135	119	0.008344	182	0.012264
85	0.018909	149	0.019543	182	0.012264
106	0.023377	121	0.009465	165	0.018944
80	0.013131	137	0.018166	129	0.005343
111	0.017959	161	0.01472	182	0.012264
121	0.007377	112	0.004965	161	0.019059
102	0.026461	179	0.004932	182	0.012264
109	0.020248	170	0.00942	166	0.018808
95	0.027288	167	0.011177	167	0.018629
86	0.020047	152	0.018825	191	0.007451
110	0.019116	159	0.015819	128	0.004945
95	0.027288	144	0.019796	153	0.017282
82	0.015415	144	0.019796	125	0.003865
76	0.008991	159	0.015819	166	0.018808
114	0.014468	156	0.017299	179	0.013895
112	0.016792	178	0.005353	167	0.018629
117	0.011159	147	0.01979	134	0.007608
99	0.027601	166	0.011775	171	0.017526
105	0.024288	157	0.016832	160	0.018979
86	0.020047	128	0.01361	188	0.008981
106	0.023377	121	0.009465	153	0.017282
116	0.012227	151	0.019109	158	0.018691
118	0.010135	140	0.019129	160	0.018979
116	0.012227	151	0.019109	173	0.016767
75	0.008081	173	0.007763	126	0.004205
97	0.027711	132	0.015862	141	0.011334
90	0.02413	168	0.010584	139	0.01023
114	0.014468	116	0.00678	147	0.014585
119	0.009161	177	0.005795	178	0.01442
118	0.010135	121	0.009465	190	0.007948
104	0.025113	165	0.012374	143	0.012441

99	0.027601	164	0.012971	195	0.005625
94	0.026884	113	0.005387	158	0.018691
78	0.010971	146	0.019841	195	0.005625
91	0.024971	158	0.016338	143	0.012441
101	0.026966	157	0.016832	170	0.017857
120	0.008241	120	0.008898	158	0.018691
107	0.022392	173	0.007763	132	0.006651
119	0.009161	117	0.007284	192	0.006969
82	0.015415	132	0.015862	173	0.016767
99	0.027601	130	0.014766	173	0.016767
75	0.008081	119	0.008344	133	0.007122
98	0.027723	125	0.011823	142	0.011888
119	0.009161	174	0.007243	187	0.009514
86	0.020047	128	0.01361	124	0.003544
78	0.010971	159	0.015819	149	0.015575
115	0.013333	167	0.011177	154	0.017636
82	0.015415	155	0.017734	122	0.002959
109	0.020248	116	0.00678	184	0.011156
120	0.008241	121	0.009465	141	0.011334
79	0.012032	128	0.01361	172	0.017162
110	0.019116	171	0.008853	162	0.019096
99	0.027601	127	0.013018	161	0.019059
80	0.013131	127	0.013018	171	0.017526
121	0.007377	116	0.00678	196	0.005214
87	0.021151	134	0.016871	187	0.009514
88	0.022208	133	0.016379	141	0.011334
91	0.024971	176	0.006257	124	0.003544
104	0.025113	159	0.015819	180	0.01336
86	0.020047	148	0.019691	184	0.011156
100	0.027348	142	0.019556	191	0.007451
103	0.025841	138	0.018527	180	0.01336
91	0.024971	139	0.018849	178	0.01442
96	0.027565	112	0.004965	140	0.01078
80	0.013131	175	0.00674	193	0.006504
107	0.022392	161	0.01472	163	0.019089
108	0.021345	142	0.019556	158	0.018691
78	0.010971	128	0.01361	180	0.01336
79	0.012032	143	0.0197	131	0.006197
83	0.016581	177	0.005795	171	0.017526
93	0.026358	123	0.010631	140	0.01078
85	0.018909	139	0.018849	179	0.013895
110	0.019116	134	0.016871	180	0.01336
107	0.022392	146	0.019841	150	0.016041
112	0.016792	138	0.018527	154	0.017636
80	0.013131	153	0.0185	177	0.01493
80	0.013131	146	0.019841	160	0.018979
107	0.022392	175	0.00674	133	0.007122

113	0.015624	129	0.014194	165	0.018944
102	0.026461	177	0.005795	196	0.005214
84	0.01775	119	0.008344	182	0.012264
84	0.01775	139	0.018849	187	0.009514
96	0.027565	139	0.018849	147	0.014585
99	0.027601	136	0.017767	183	0.011711
91	0.024971	127	0.013018	176	0.015422
91	0.024971	116	0.00678	160	0.018979
121	0.007377	173	0.007763	165	0.018944
75	0.008081	137	0.018166	168	0.01841
81	0.014262	175	0.00674	191	0.007451

MODEL-11

Appendix 11
INPUT

A	B	C	D	E	F	G	H	SR.NO.
23	28	43	50	75	75	125	133	1
23	35	42	62	67	75	94	105	2
16	32	42	57	91	62	99	111	3
16	35	33	64	72	61	120	143	4
17	29	40	61	78	78	132	118	5
23	29	36	69	74	86	120	146	6
21	30	35	61	92	67	102	115	7
22	35	43	69	65	78	99	118	8
22	33	39	62	63	75	125	101	9
22	27	37	46	86	61	93	103	10
20	29	36	54	81	73	112	106	11
16	27	37	56	79	85	124	129	12
22	34	31	49	62	79	128	111	13
21	25	38	54	87	64	125	133	14
21	27	39	50	90	68	100	122	15
23	27	41	60	76	90	117	135	16
23	27	44	51	67	64	127	113	17
18	24	35	50	65	67	97	117	18
23	34	37	64	62	77	96	137	19
16	31	36	46	76	88	121	105	20
23	26	30	64	63	80	113	99	21
21	30	33	56	64	81	102	124	22
22	23	38	57	89	79	101	136	23
18	24	38	47	65	74	134	116	24
16	31	37	59	66	90	105	132	25
18	34	34	50	62	65	115	137	26
17	34	41	70	89	75	91	106	27
21	30	43	68	77	63	126	109	28
18	26	38	57	66	60	105	109	29
17	34	40	67	67	70	90	113	30
20	27	33	65	86	63	101	102	31
16	31	32	60	84	72	104	111	32
21	33	39	49	72	60	127	135	33
23	26	34	56	81	80	121	111	34
17	32	42	57	91	86	94	98	35
22	25	36	63	65	88	91	111	36
17	23	41	70	70	78	126	119	37
21	29	38	66	78	76	126	102	38
24	28	39	64	75	71	98	113	39
19	32	37	54	75	77	119	109	40
24	30	44	67	89	88	115	124	41

Appendix 11.1
OUTPUT

A	B	C	D	E	F	G	H
27	34	50	62	90	90	147	157
27	41	49	74	82	90	116	129
20	38	49	69	106	77	121	135
20	41	40	76	87	76	142	167
21	35	47	73	93	93	159	142
27	35	43	81	89	101	142	170
25	36	42	73	107	82	124	139
26	41	50	81	80	93	121	142
26	39	46	74	78	90	147	125
26	33	44	58	101	76	115	127
24	35	43	66	96	88	134	130
20	33	44	68	94	100	146	153
26	40	38	61	77	94	150	135
25	31	45	66	102	79	147	157
25	33	46	62	105	83	122	146
27	33	48	72	91	105	139	159
27	33	51	63	82	79	149	137
22	30	42	62	80	82	119	141
27	40	44	76	77	92	118	161
20	37	43	58	91	103	143	129
27	32	37	76	78	95	135	123
25	36	40	68	79	96	124	148
26	29	45	69	104	94	123	160
22	30	45	59	80	89	156	140
20	37	44	71	81	105	127	156
22	40	41	62	77	80	137	161
21	40	48	82	104	90	113	130
25	36	50	80	92	78	148	133
22	32	45	69	81	75	127	133
21	40	47	79	82	85	112	137
24	33	40	77	101	78	123	126
20	37	39	72	99	87	126	135
25	39	46	61	87	75	149	159
27	32	41	68	96	95	143	135
21	38	49	69	106	101	116	122
26	31	43	75	80	103	113	135
21	29	48	82	85	93	148	143
25	35	45	78	93	91	148	126
28	34	46	76	90	86	120	137
23	38	44	66	90	92	141	133
28	36	51	79	104	103	137	148

17	25	37	61	62	71	134	113		42		21	31	44	73	77	86	156	137
18	25	41	52	77	75	134	104		43		22	31	48	64	92	90	156	128
23	23	30	56	68	67	103	134		44		27	29	37	68	83	82	125	158
19	27	34	68	67	87	127	141		45		23	33	41	80	82	102	149	165
24	27	33	68	69	88	100	134		46		28	33	40	80	84	103	122	158
18	31	33	52	90	81	104	112		47		22	37	40	64	105	96	126	136
16	35	42	49	90	86	112	115		48		20	41	49	61	105	101	134	139
24	27	36	62	81	74	128	127		49		28	33	43	74	96	89	150	151
16	26	39	50	82	65	93	134		50		20	32	46	62	97	80	115	158
16	31	33	58	68	78	105	123		51		20	37	40	70	83	93	127	147
18	25	44	66	71	62	125	123		52		22	31	51	78	86	77	147	147
16	25	41	63	85	64	126	115		53		20	31	48	75	100	79	148	139
24	28	30	56	92	66	98	102		54		28	34	37	68	105	81	120	126
18	27	42	52	78	82	97	115		55		22	33	49	64	93	97	119	139
16	26	31	69	72	70	133	143		56		20	32	38	81	87	85	155	167
21	23	34	53	84	86	126	101		57		25	29	41	65	99	101	148	125
24	33	37	69	69	70	122	108		58		28	39	44	81	84	85	144	132
21	29	32	54	84	75	126	105		59		25	35	39	66	99	90	148	129
22	32	44	57	79	61	109	142		60		26	38	51	69	94	76	131	166
19	26	35	63	84	60	134	104		61		23	32	42	75	99	75	156	128
16	24	44	48	85	79	101	118		62		20	30	51	60	100	94	123	142
17	29	33	56	63	77	130	113		63		21	35	40	68	78	92	152	137
22	23	36	50	70	70	96	137		64		26	29	43	62	85	85	118	161
24	33	32	50	72	84	92	123		65		28	39	39	62	87	99	114	147
20	32	36	57	76	74	123	107		66		24	38	43	69	91	89	145	131
17	30	34	70	87	75	105	124		67		21	36	41	82	102	90	127	148
24	28	42	59	77	63	112	141		68		28	34	49	71	92	78	134	165
19	31	30	62	85	76	115	112		69		23	37	37	74	100	91	137	136
18	23	44	62	78	77	119	120		70		22	29	51	74	93	92	141	144
22	34	38	49	62	67	96	101		71		26	40	45	61	77	82	118	125
20	23	37	58	87	84	128	108		72		24	29	44	70	102	99	150	132
24	25	31	49	82	78	106	104		73		28	31	38	61	97	93	128	128
18	34	42	61	65	79	101	134		74		22	40	49	73	80	94	123	158
21	27	39	47	64	86	124	127		75		25	33	46	59	79	101	146	151
24	29	36	66	87	88	101	117		76		28	35	43	78	102	103	123	141
20	24	34	69	81	67	101	111		77		24	30	41	81	96	82	123	135
20	24	40	50	74	68	127	106		78		24	30	47	62	89	83	149	130
21	23	44	70	70	83	104	108		79		25	29	51	82	85	98	126	132
16	24	44	70	72	68	122	134		80		20	30	51	82	87	83	144	158
20	35	34	56	66	67	127	127		81		24	41	41	68	81	82	149	151
19	30	35	48	65	88	128	102		82		23	36	42	60	80	103	150	126
16	31	34	49	75	77	131	140		83		20	37	41	61	90	92	153	164
23	27	38	52	88	65	111	134		84		27	33	45	64	103	80	133	158
22	25	30	48	67	65	110	105		85		26	31	37	60	82	80	132	129
24	32	44	64	68	68	127	130		86		28	38	51	76	83	83	149	154
19	34	31	58	70	76	126	116		87		23	40	38	70	85	91	148	140
20	24	40	59	72	82	127	105		88		24	30	47	71	87	97	149	129

17	30	31	52	82	66	121	108	89	21	36	38	64	97	81	143	132
19	24	36	64	77	64	111	120	90	23	30	43	76	92	79	133	144
22	24	44	65	92	81	113	126	91	26	30	51	77	107	96	135	150
19	30	32	64	62	73	122	107	92	23	36	39	76	77	88	144	131
23	26	32	62	91	73	92	123	93	27	32	39	74	106	88	114	147
23	30	30	67	74	64	101	115	94	27	36	37	79	89	79	123	139
17	24	43	65	92	65	119	100	95	21	30	50	77	107	80	141	124
18	27	43	58	87	73	108	98	96	22	33	50	70	102	88	130	122
16	33	39	57	75	84	130	105	97	20	39	46	69	90	99	152	129
20	33	42	60	64	85	123	103	98	24	39	49	72	79	100	145	127
18	29	43	47	63	66	132	123	99	22	35	50	59	78	81	154	147
17	26	35	52	62	69	134	107	100	21	32	42	64	77	84	156	131

Mean	24	35	44	70	90.6	89.1	136	141.5
S.D	2.7	3.7	4.3	7.1	9.48	8.52	13.5	12.92
CoV	11	11	9.8	10	10.5	9.56	9.89	9.133

Appendix 11.2

A	ND		B	ND		C	ND		D	ND		E	ND	
	27	0.07597		34	0.107518		50	0.03888		62	0.02844		90	0.041999
	27	0.07597		41	0.022825		49	0.051254		74	0.048947		82	0.02786
	20	0.05303		38	0.069154		49	0.051254		69	0.055162		106	0.011266
	20	0.05303		41	0.022825		40	0.05614		76	0.040635		87	0.039142
	21	0.083734		35	0.107598		47	0.075924		73	0.052152		93	0.040769
	27	0.07597		35	0.107598		43	0.087943		81	0.018057		89	0.041483
	25	0.134739		36	0.099992		42	0.079864		73	0.052152		107	0.00944
	26	0.108247		41	0.022825		50	0.03888		81	0.018057		80	0.022495
	26	0.108247		39	0.051464		46	0.085314		74	0.048947		78	0.017373
	26	0.108247		33	0.09977		44	0.091819		58	0.012611		101	0.023081
	24	0.146515		35	0.107598		43	0.087943		66	0.046754		96	0.035804
	20	0.05303		33	0.09977		44	0.091819		68	0.053246		94	0.039479
	26	0.108247		40	0.035566		38	0.031894		61	0.023906		77	0.015014
	25	0.134739		31	0.068797		45	0.090895		66	0.046754		102	0.020447
	25	0.134739		33	0.09977		46	0.085314		62	0.02844		105	0.013296
	27	0.07597		33	0.09977		48	0.064065		72	0.05448		91	0.04205
	27	0.07597		33	0.09977		51	0.027963		63	0.033172		82	0.02786
	22	0.115501		30	0.051123		42	0.079864		62	0.02844		80	0.022495
	27	0.07597		40	0.035566		44	0.091819		76	0.040635		77	0.015014
	20	0.05303		37	0.086292		43	0.087943		58	0.012611		91	0.04205
	27	0.07597		32	0.085973		37	0.022194		76	0.040635		78	0.017373
	25	0.134739		36	0.099992		40	0.05614		68	0.053246		79	0.019879
	26	0.108247		29	0.035278		45	0.090895		69	0.055162		104	0.015519
	22	0.115501		30	0.051123		45	0.090895		59	0.015919		80	0.022495
	20	0.05303		37	0.086292		44	0.091819		71	0.055798		81	0.025174
	22	0.115501		40	0.035566		41	0.068766		62	0.02844		77	0.015014
	21	0.083734		40	0.035566		48	0.064065		82	0.01447		104	0.015519
	25	0.134739		36	0.099992		50	0.03888		80	0.022093		92	0.041636
	22	0.115501		32	0.085973		45	0.090895		69	0.055162		81	0.025174
	21	0.083734		40	0.035566		47	0.075924		79	0.026503		82	0.02786
	24	0.146515		33	0.09977		40	0.05614		77	0.035943		101	0.023081
	20	0.05303		37	0.086292		39	0.043456		72	0.05448		99	0.028446
	25	0.134739		39	0.051464		46	0.085314		61	0.023906		87	0.039142
	27	0.07597		32	0.085973		41	0.068766		68	0.053246		96	0.035804
	21	0.083734		38	0.069154		49	0.051254		69	0.055162		106	0.011266
	26	0.108247		31	0.068797		43	0.087943		75	0.045041		80	0.022495
	21	0.083734		29	0.035278		48	0.064065		82	0.01447		85	0.035325
	25	0.134739		35	0.107598		45	0.090895		78	0.03117		93	0.040769
	28	0.046578		34	0.107518		46	0.085314		76	0.040635		90	0.041999
	23	0.139181		38	0.069154		44	0.091819		66	0.046754		90	0.041999
	28	0.046578		36	0.099992		51	0.027963		79	0.026503		104	0.015519

21	0.083734	31	0.068797	44	0.091819	73	0.052152	77	0.015014
22	0.115501	31	0.068797	48	0.064065	64	0.037935	92	0.041636
27	0.07597	29	0.035278	37	0.022194	68	0.053246	83	0.030492
23	0.139181	33	0.09977	41	0.068766	80	0.022093	82	0.02786
28	0.046578	33	0.09977	40	0.05614	80	0.022093	84	0.033003
22	0.115501	37	0.086292	40	0.05614	64	0.037935	105	0.013296
20	0.05303	41	0.022825	49	0.051254	61	0.023906	105	0.013296
28	0.046578	33	0.09977	43	0.087943	74	0.048947	96	0.035804
20	0.05303	32	0.085973	46	0.085314	62	0.02844	97	0.033532
20	0.05303	37	0.086292	40	0.05614	70	0.05603	83	0.030492
22	0.115501	31	0.068797	51	0.027963	78	0.03117	86	0.037392
20	0.05303	31	0.068797	48	0.064065	75	0.045041	100	0.025767
28	0.046578	34	0.107518	37	0.022194	68	0.053246	105	0.013296
22	0.115501	33	0.09977	49	0.051254	64	0.037935	93	0.040769
20	0.05303	32	0.085973	38	0.031894	81	0.018057	87	0.039142
25	0.134739	29	0.035278	41	0.068766	65	0.042532	99	0.028446
28	0.046578	39	0.051464	44	0.091819	81	0.018057	84	0.033003
25	0.134739	35	0.107598	39	0.043456	66	0.046754	99	0.028446
26	0.108247	38	0.069154	51	0.027963	69	0.055162	94	0.039479
23	0.139181	32	0.085973	42	0.079864	75	0.045041	99	0.028446
20	0.05303	30	0.051123	51	0.027963	60	0.019701	100	0.025767
21	0.083734	35	0.107598	40	0.05614	68	0.053246	78	0.017373
26	0.108247	29	0.035278	43	0.087943	62	0.02844	85	0.035325
28	0.046578	39	0.051464	39	0.043456	62	0.02844	87	0.039142
24	0.146515	38	0.069154	43	0.087943	69	0.055162	91	0.04205
21	0.083734	36	0.099992	41	0.068766	82	0.01447	102	0.020447
28	0.046578	34	0.107518	49	0.051254	71	0.055798	92	0.041636
23	0.139181	37	0.086292	37	0.022194	74	0.048947	100	0.025767
22	0.115501	29	0.035278	51	0.027963	74	0.048947	93	0.040769
26	0.108247	40	0.035566	45	0.090895	61	0.023906	77	0.015014
24	0.146515	29	0.035278	44	0.091819	70	0.05603	102	0.020447
28	0.046578	31	0.068797	38	0.031894	61	0.023906	97	0.033532
22	0.115501	40	0.035566	49	0.051254	73	0.052152	80	0.022495
25	0.134739	33	0.09977	46	0.085314	59	0.015919	79	0.019879
28	0.046578	35	0.107598	43	0.087943	78	0.03117	102	0.020447
24	0.146515	30	0.051123	41	0.068766	81	0.018057	96	0.035804
24	0.146515	30	0.051123	47	0.075924	62	0.02844	89	0.041483
25	0.134739	29	0.035278	51	0.027963	82	0.01447	85	0.035325
20	0.05303	30	0.051123	51	0.027963	82	0.01447	87	0.039142
24	0.146515	41	0.022825	41	0.068766	68	0.053246	81	0.025174
23	0.139181	36	0.099992	42	0.079864	60	0.019701	80	0.022495
20	0.05303	37	0.086292	41	0.068766	61	0.023906	90	0.041999
27	0.07597	33	0.09977	45	0.090895	64	0.037935	103	0.017913
26	0.108247	31	0.068797	37	0.022194	60	0.019701	82	0.02786
28	0.046578	38	0.069154	51	0.027963	76	0.040635	83	0.030492
23	0.139181	40	0.035566	38	0.031894	70	0.05603	85	0.035325
24	0.146515	30	0.051123	47	0.075924	71	0.055798	87	0.039142

21	0.083734	36	0.099992	38	0.031894	64	0.037935	97	0.033532
23	0.139181	30	0.051123	43	0.087943	76	0.040635	92	0.041636
26	0.108247	30	0.051123	51	0.027963	77	0.035943	107	0.00944
23	0.139181	36	0.099992	39	0.043456	76	0.040635	77	0.015014
27	0.07597	32	0.085973	39	0.043456	74	0.048947	106	0.011266
27	0.07597	36	0.099992	37	0.022194	79	0.026503	89	0.041483
21	0.083734	30	0.051123	50	0.03888	77	0.035943	107	0.00944
22	0.115501	33	0.09977	50	0.03888	70	0.05603	102	0.020447
20	0.05303	39	0.051464	46	0.085314	69	0.055162	90	0.041999
24	0.146515	39	0.051464	49	0.051254	72	0.05448	79	0.019879
22	0.115501	35	0.107598	50	0.03888	59	0.015919	78	0.017373
21	0.083734	32	0.085973	42	0.079864	64	0.037935	77	0.015014

F	ND	G	ND	H	ND
90	0.046572	147	0.021191	157	0.015052
90	0.046572	116	0.009852	129	0.019322
77	0.017051	121	0.015966	135	0.02719
76	0.014332	142	0.026824	167	0.004414
93	0.042191	159	0.006848	142	0.030845
101	0.017683	142	0.026824	170	0.002719
82	0.033056	124	0.019962	139	0.030291
93	0.042191	121	0.015966	142	0.030845
90	0.046572	147	0.021191	125	0.013651
76	0.014332	115	0.008798	127	0.016436
88	0.046431	134	0.029343	130	0.020762
100	0.020687	146	0.022461	153	0.020791
94	0.039715	150	0.017215	135	0.02719
79	0.023158	147	0.021191	157	0.015052
83	0.036208	122	0.017295	146	0.02906
105	0.008225	139	0.028917	159	0.012355
79	0.023158	149	0.018552	137	0.029044
82	0.033056	119	0.013382	141	0.030843
92	0.044208	118	0.01215	161	0.009901
103	0.012397	143	0.025873	129	0.019322
95	0.036873	135	0.029583	123	0.011069
96	0.033765	124	0.019962	148	0.027211
94	0.039715	123	0.018632	160	0.011093
89	0.046822	156	0.009786	140	0.030657
105	0.008225	127	0.023746	156	0.016465
80	0.026437	137	0.029573	161	0.009901
90	0.046572	113	0.006901	130	0.020762
78	0.020009	148	0.019882	133	0.024852
75	0.011881	127	0.023746	133	0.024852
85	0.041683	112	0.006061	137	0.029044
78	0.020009	123	0.018632	126	0.015024
87	0.045412	126	0.022535	135	0.02719
75	0.011881	149	0.018552	159	0.012355
95	0.036873	143	0.025873	135	0.02719
101	0.017683	116	0.009852	122	0.009878
103	0.012397	113	0.006901	135	0.02719
93	0.042191	148	0.019882	143	0.030663
91	0.045688	148	0.019882	126	0.015024
86	0.043808	120	0.014657	137	0.029044
92	0.044208	141	0.027657	133	0.024852
103	0.012397	137	0.029573	148	0.027211

86	0.043808	156	0.009786	137	0.029044
90	0.046572	156	0.009786	128	0.017874
82	0.033056	125	0.021268	158	0.013678
102	0.014908	149	0.018552	165	0.005918
103	0.012397	122	0.017295	158	0.013678
96	0.033765	126	0.022535	136	0.028186
101	0.017683	134	0.029343	139	0.030291
89	0.046822	150	0.017215	151	0.023574
80	0.026437	115	0.008798	158	0.013678
93	0.042191	127	0.023746	147	0.028204
77	0.017051	147	0.021191	147	0.028204
79	0.023158	148	0.019882	139	0.030291
81	0.029766	120	0.014657	126	0.015024
97	0.030497	119	0.013382	139	0.030291
85	0.041683	155	0.010902	167	0.004414
101	0.017683	148	0.019882	125	0.013651
85	0.041683	144	0.024819	132	0.023547
90	0.046572	148	0.019882	129	0.019322
76	0.014332	131	0.027703	166	0.005127
75	0.011881	156	0.009786	128	0.017874
94	0.039715	123	0.018632	142	0.030845
92	0.044208	152	0.01458	137	0.029044
85	0.041683	118	0.01215	161	0.009901
99	0.023871	114	0.007813	147	0.028204
89	0.046822	145	0.023676	131	0.022177
90	0.046572	127	0.023746	148	0.027211
78	0.020009	134	0.029343	165	0.005918
91	0.045688	137	0.029573	136	0.028186
92	0.044208	141	0.027657	144	0.0303
82	0.033056	118	0.01215	125	0.013651
99	0.023871	150	0.017215	132	0.023547
93	0.042191	128	0.024884	128	0.017874
94	0.039715	123	0.018632	158	0.013678
101	0.017683	146	0.022461	151	0.023574
103	0.012397	123	0.018632	141	0.030843
82	0.033056	123	0.018632	135	0.02719
83	0.036208	149	0.018552	130	0.020762
98	0.027168	126	0.022535	132	0.023547
83	0.036208	144	0.024819	158	0.013678
82	0.033056	149	0.018552	151	0.023574
103	0.012397	150	0.017215	126	0.015024
92	0.044208	153	0.013307	164	0.006792
80	0.026437	133	0.028946	158	0.013678
80	0.026437	132	0.028396	129	0.019322
83	0.036208	149	0.018552	154	0.019351
91	0.045688	148	0.019882	140	0.030657
97	0.030497	149	0.018552	129	0.019322

81	0.029766	143	0.025873	132	0.023547
79	0.023158	133	0.028946	144	0.0303
96	0.033765	135	0.029583	150	0.024877
88	0.046431	144	0.024819	131	0.022177
88	0.046431	114	0.007813	147	0.028204
79	0.023158	123	0.018632	139	0.030291
80	0.026437	141	0.027657	124	0.012329
88	0.046431	130	0.026878	122	0.009878
99	0.023871	152	0.01458	129	0.019322
100	0.020687	145	0.023676	127	0.016436
81	0.029766	154	0.012078	147	0.028204
84	0.039118	156	0.009786	131	0.022177

MODEL-12

Appendix 12

INPUT

A	B	C	D	E	F	G	H
17	30	40	50	70	82	99	135
23	31	34	53	83	75	105	130
17	30	41	61	69	72	123	111
22	33	36	52	79	76	96	106
23	25	35	57	75	75	128	128
21	32	36	55	68	75	110	131
21	32	35	65	75	84	114	127
17	27	31	59	85	64	104	131
19	26	42	64	78	82	116	111
17	30	34	55	79	78	103	133
17	31	42	58	79	73	120	116
20	28	40	50	67	69	128	107
18	25	39	61	65	73	109	139
20	30	43	51	73	84	124	115
18	32	33	64	79	77	127	137
19	26	32	66	72	82	110	124
19	31	39	63	79	84	121	123
21	31	39	53	89	68	108	104
18	30	36	58	72	79	121	139
17	30	33	62	77	68	98	120
17	32	36	63	75	85	124	139
17	25	37	64	89	74	123	140
19	28	34	58	88	82	100	123
17	31	37	60	83	65	113	123
22	27	34	67	74	72	119	136
17	29	37	61	65	80	97	130
17	33	32	67	86	70	119	126
22	32	34	58	82	82	100	112
20	29	42	63	88	83	112	129
19	31	35	59	66	69	107	114
20	29	34	57	79	64	95	117
19	27	36	54	71	67	118	122
23	33	43	63	77	80	127	117
23	28	34	61	65	81	126	114
20	27	37	50	78	80	123	138
23	27	42	65	81	73	99	124
22	28	39	53	78	75	120	128
17	31	38	64	66	83	125	130
18	31	42	61	73	86	107	114
19	31	43	56	81	68	128	108
17	28	33	55	77	81	101	128
23	26	40	66	84	75	113	132

Appendix 12.1

OUTPUT

SR.NO.	A	B	C	D	E	F	G	H
1	20	34	46	59	82	93	116	153
2	26	35	40	62	95	86	122	148
3	20	34	47	70	81	83	140	129
4	25	37	42	61	91	87	113	124
5	26	29	41	66	87	86	145	146
6	24	36	42	64	80	86	127	149
7	24	36	41	74	87	95	131	145
8	20	31	37	68	97	75	121	149
9	22	30	48	73	90	93	133	129
10	20	34	40	54	91	89	120	151
11	20	35	48	67	91	84	137	134
12	23	32	46	59	79	80	145	125
13	21	29	45	70	77	84	126	157
14	23	34	49	60	85	95	141	133
15	21	36	39	73	91	88	144	155
16	22	30	38	75	84	93	127	142
17	22	35	45	72	91	95	139	141
18	24	35	45	62	101	79	125	122
19	21	34	42	67	84	90	138	157
20	20	34	39	71	89	79	115	138
21	20	36	42	72	87	96	141	157
22	20	29	43	73	101	85	140	158
23	22	32	40	67	100	93	117	141
24	20	35	43	69	95	76	130	131
25	25	31	40	76	86	83	136	154
26	20	33	43	70	77	91	114	148
27	20	37	38	76	98	81	136	144
28	25	36	40	67	94	93	117	130
29	23	33	48	72	100	94	129	147
30	22	35	41	68	78	80	124	132
31	23	33	40	66	91	75	112	135
32	22	31	42	63	83	78	135	140
33	26	37	49	72	89	91	144	135
34	26	32	40	70	77	92	143	132
35	23	31	43	59	90	91	140	156
36	26	31	48	74	93	84	116	142
37	25	32	45	62	90	86	137	146
38	20	35	44	73	78	94	142	148
39	21	35	48	70	85	97	124	132
40	22	35	49	65	93	79	145	126
41	20	32	39	64	89	92	118	146
42	26	30	46	75	96	86	130	150

20	31	38	50	69	71	99	130		43	23	35	44	59	81	82	116	148
18	31	35	65	78	83	107	126		44	21	35	41	74	90	94	124	144
22	26	40	59	74	70	119	119		45	25	30	46	68	86	71	136	137
20	30	38	55	78	82	127	128		46	23	34	44	64	90	93	144	146
17	27	35	50	85	78	125	125		47	20	30	41	59	97	89	142	143
22	27	39	63	70	71	95	131		48	25	31	45	72	82	82	112	149
23	32	43	54	87	68	102	129		49	26	36	49	63	99	79	119	147
17	32	32	55	73	74	112	120		50	20	36	38	64	85	85	129	138
22	33	35	54	69	78	96	128		51	25	37	41	63	81	89	113	146
21	33	33	63	78	70	122	107		52	24	37	39	72	90	81	139	125
20	28	36	62	71	78	111	139		53	23	32	42	71	83	89	128	157
17	26	34	49	70	74	109	106		54	20	30	40	58	82	85	126	124
20	25	42	61	88	86	113	131		55	23	29	48	70	100	97	130	149
21	27	42	50	79	65	113	133		56	24	31	48	59	91	76	130	151
18	33	42	52	83	83	123	111		57	21	37	48	61	95	94	140	129
21	30	35	50	72	78	103	138		58	24	34	41	59	84	89	120	156
21	33	40	62	82	64	97	135		59	24	37	46	71	94	75	114	153
17	26	32	57	71	86	111	140		60	20	30	38	66	83	97	128	158
17	31	37	59	80	66	98	115		61	20	35	43	68	92	77	115	133
19	29	38	54	73	79	100	140		62	22	33	44	63	85	90	117	158
18	25	41	65	68	78	119	112		63	21	29	47	74	80	89	136	130
20	28	31	66	81	73	111	114		64	23	32	37	75	93	84	128	132
20	26	35	53	80	67	109	111		65	23	30	41	62	92	78	126	129
23	27	37	60	86	77	121	125		66	26	31	43	69	98	88	138	143
17	31	43	59	87	66	101	112		67	20	35	49	68	99	77	118	130
20	32	31	54	88	79	113	112		68	23	36	37	63	100	90	130	130
17	32	34	54	82	64	120	129		69	20	36	40	63	94	75	137	147
21	31	41	54	86	84	120	119		70	24	35	47	63	98	95	137	137
21	31	31	65	89	77	122	118		71	24	35	37	74	101	88	139	136
17	26	34	58	75	66	127	125		72	20	30	40	67	87	77	144	143
20	29	37	50	68	84	106	126		73	23	34	43	59	80	95	123	144
20	30	40	67	74	69	119	130		74	23	34	46	76	86	80	136	148
22	29	34	66	88	74	123	115		75	25	33	40	75	100	85	140	133
19	28	31	52	66	67	102	131		76	22	32	37	61	78	78	119	149
23	26	35	53	82	75	95	121		77	26	30	41	62	94	86	112	139
20	31	39	57	73	86	120	110		78	23	35	45	66	85	97	137	128
18	29	33	53	75	83	108	104		79	21	33	39	62	87	94	125	122
19	33	38	67	84	78	111	116		80	22	37	44	76	96	89	128	134
21	30	42	55	71	74	108	138		81	24	34	48	64	83	85	125	156
18	30	31	63	79	67	118	138		82	21	34	37	72	91	78	135	156
17	26	41	53	69	80	123	127		83	20	30	47	62	81	91	140	145
20	26	34	59	76	78	121	125		84	23	30	40	68	88	89	138	143
17	27	43	49	86	79	112	140		85	20	31	49	58	98	90	129	158
17	32	34	50	74	69	127	130		86	20	36	40	59	86	80	144	148
17	25	43	67	87	84	122	137		87	20	29	49	76	99	95	139	155
23	28	41	53	67	64	105	120		88	26	32	47	62	79	75	122	138
18	28	43	54	74	67	121	111		89	21	32	49	63	86	78	138	129

21	32	33	62	66	66	100	138	90	24	36	39	71	78	77	117	156
17	29	31	53	65	65	120	122	91	20	33	37	62	77	76	137	140
22	31	41	63	83	69	96	139	92	25	35	47	72	95	80	113	157
20	26	39	66	75	82	97	134	93	23	30	46	75	87	93	114	152
19	31	40	62	65	65	110	123	94	22	35	46	71	77	76	127	141
20	31	37	50	89	85	126	135	95	23	35	43	59	101	96	143	153
18	28	31	52	87	77	120	139	96	21	32	37	61	99	88	137	157
22	25	37	55	89	81	104	113	97	25	29	43	64	101	92	121	131
21	33	34	54	88	76	104	120	98	24	37	40	63	100	87	121	138
17	27	41	59	65	66	126	135	99	20	31	47	68	77	77	148	153
18	30	41	66	88	80	108	124	100	21	34	47	75	100	91	125	142

Mean	22.5	33.2	43.1	67	89	86.1	130	143
S.D	2.05	2.48	3.75	5.6	7.4	6.87	10	10.3
CoV	9.11	7.45	8.71	8.4	8.3	7.98	7.9	7.21

Appendix 12.2

A	ND	B	ND	C	ND	D	ND
20	0.094664	34	0.153297	46	0.07855	59	0.026144
26	0.04369	35	0.124421	40	0.075916	62	0.048248
20	0.094664	34	0.153297	47	0.061605	70	0.061242
25	0.090252	37	0.050254	42	0.102023	61	0.040602
26	0.04369	29	0.037717	41	0.09119	66	0.070057
24	0.146855	36	0.08579	42	0.102023	64	0.061946
24	0.146855	36	0.08579	41	0.09119	74	0.032232
20	0.094664	31	0.10779	37	0.028599	68	0.069791
22	0.19003	30	0.069177	48	0.045001	73	0.039686
20	0.094664	34	0.153297	40	0.075916	54	0.004994
20	0.094664	35	0.124421	48	0.045001	67	0.071041
23	0.188225	32	0.142684	46	0.07855	59	0.026144
21	0.151121	29	0.037717	45	0.093287	70	0.061242
23	0.188225	34	0.153297	49	0.030618	60	0.033102
21	0.151121	36	0.08579	39	0.058866	73	0.039686
22	0.19003	30	0.069177	38	0.042515	75	0.02536
22	0.19003	35	0.124421	45	0.093287	72	0.047338
24	0.146855	35	0.124421	45	0.093287	62	0.048248
21	0.151121	34	0.153297	42	0.102023	67	0.071041
20	0.094664	34	0.153297	39	0.058866	71	0.054704
20	0.094664	36	0.08579	42	0.102023	72	0.047338
20	0.094664	29	0.037717	43	0.106316	73	0.039686
22	0.19003	32	0.142684	40	0.075916	67	0.071041
20	0.094664	35	0.124421	43	0.106316	69	0.066422
25	0.090252	31	0.10779	40	0.075916	76	0.019331
20	0.094664	33	0.160458	43	0.106316	70	0.061242
20	0.094664	37	0.050254	38	0.042515	76	0.019331
25	0.090252	36	0.08579	40	0.075916	67	0.071041
23	0.188225	33	0.160458	48	0.045001	72	0.047338
22	0.19003	35	0.124421	41	0.09119	68	0.069791
23	0.188225	33	0.160458	40	0.075916	66	0.070057
22	0.19003	31	0.10779	42	0.102023	63	0.055543
26	0.04369	37	0.050254	49	0.030618	72	0.047338
26	0.04369	32	0.142684	40	0.075916	70	0.061242
23	0.188225	31	0.10779	43	0.106316	59	0.026144
26	0.04369	31	0.10779	48	0.045001	74	0.032232
25	0.090252	32	0.142684	45	0.093287	62	0.048248
20	0.094664	35	0.124421	44	0.10319	73	0.039686
21	0.151121	35	0.124421	48	0.045001	70	0.061242
22	0.19003	35	0.124421	49	0.030618	65	0.06693
20	0.094664	32	0.142684	39	0.058866	64	0.061946
26	0.04369	30	0.069177	46	0.07855	75	0.02536

23	0.188225	35	0.124421	44	0.10319	59	0.026144
21	0.151121	35	0.124421	41	0.09119	74	0.032232
25	0.090252	30	0.069177	46	0.07855	68	0.069791
23	0.188225	34	0.153297	44	0.10319	64	0.061946
20	0.094664	30	0.069177	41	0.09119	59	0.026144
25	0.090252	31	0.10779	45	0.093287	72	0.047338
26	0.04369	36	0.08579	49	0.030618	63	0.055543
20	0.094664	36	0.08579	38	0.042515	64	0.061946
25	0.090252	37	0.050254	41	0.09119	63	0.055543
24	0.146855	37	0.050254	39	0.058866	72	0.047338
23	0.188225	32	0.142684	42	0.102023	71	0.054704
20	0.094664	30	0.069177	40	0.075916	58	0.020005
23	0.188225	29	0.037717	48	0.045001	70	0.061242
24	0.146855	31	0.10779	48	0.045001	59	0.026144
21	0.151121	37	0.050254	48	0.045001	61	0.040602
24	0.146855	34	0.153297	41	0.09119	59	0.026144
24	0.146855	37	0.050254	46	0.07855	71	0.054704
20	0.094664	30	0.069177	38	0.042515	66	0.070057
20	0.094664	35	0.124421	43	0.106316	68	0.069791
22	0.19003	33	0.160458	44	0.10319	63	0.055543
21	0.151121	29	0.037717	47	0.061605	74	0.032232
23	0.188225	32	0.142684	37	0.028599	75	0.02536
23	0.188225	30	0.069177	41	0.09119	62	0.048248
26	0.04369	31	0.10779	43	0.106316	69	0.066422
20	0.094664	35	0.124421	49	0.030618	68	0.069791
23	0.188225	36	0.08579	37	0.028599	63	0.055543
20	0.094664	36	0.08579	40	0.075916	63	0.055543
24	0.146855	35	0.124421	47	0.061605	63	0.055543
24	0.146855	35	0.124421	37	0.028599	74	0.032232
20	0.094664	30	0.069177	40	0.075916	67	0.071041
23	0.188225	34	0.153297	43	0.106316	59	0.026144
23	0.188225	34	0.153297	46	0.07855	76	0.019331
25	0.090252	33	0.160458	40	0.075916	75	0.02536
22	0.19003	32	0.142684	37	0.028599	61	0.040602
26	0.04369	30	0.069177	41	0.09119	62	0.048248
23	0.188225	35	0.124421	45	0.093287	66	0.070057
21	0.151121	33	0.160458	39	0.058866	62	0.048248
22	0.19003	37	0.050254	44	0.10319	76	0.019331
24	0.146855	34	0.153297	48	0.045001	64	0.061946
21	0.151121	34	0.153297	37	0.028599	72	0.047338
20	0.094664	30	0.069177	47	0.061605	62	0.048248
23	0.188225	30	0.069177	40	0.075916	68	0.069791
20	0.094664	31	0.10779	49	0.030618	58	0.020005
20	0.094664	36	0.08579	40	0.075916	59	0.026144
20	0.094664	29	0.037717	49	0.030618	76	0.019331
26	0.04369	32	0.142684	47	0.061605	62	0.048248
21	0.151121	32	0.142684	49	0.030618	63	0.055543

24	0.146855	36	0.08579	39	0.058866	71	0.054704
20	0.094664	33	0.160458	37	0.028599	62	0.048248
25	0.090252	35	0.124421	47	0.061605	72	0.047338
23	0.188225	30	0.069177	46	0.07855	75	0.02536
22	0.19003	35	0.124421	46	0.07855	71	0.054704
23	0.188225	35	0.124421	43	0.106316	59	0.026144
21	0.151121	32	0.142684	37	0.028599	61	0.040602
25	0.090252	29	0.037717	43	0.106316	64	0.061946
24	0.146855	37	0.050254	40	0.075916	63	0.055543
20	0.094664	31	0.10779	47	0.061605	68	0.069791
21	0.151121	34	0.153297	47	0.061605	75	0.02536

E	ND	F	ND	G	ND	H	ND
82	0.033406	93	0.035068	116	0.016058	153	0.023034
95	0.03982	86	0.058073	122	0.029523	148	0.033645
81	0.029003	83	0.052456	140	0.02333	129	0.016378
91	0.052403	87	0.057583	113	0.010411	124	0.007676
87	0.051493	86	0.058073	145	0.012621	146	0.03664
80	0.024725	86	0.058073	127	0.037715	149	0.031786
87	0.051493	95	0.025088	131	0.038633	145	0.037696
97	0.03111	75	0.015739	121	0.027318	149	0.031786
90	0.053623	93	0.035068	133	0.036924	129	0.016378
91	0.052403	89	0.053127	120	0.025038	151	0.027576
91	0.052403	84	0.055428	137	0.030078	134	0.027576
79	0.020697	80	0.039153	145	0.012621	125	0.009103
77	0.01373	84	0.055428	126	0.036605	157	0.014344
85	0.045747	95	0.025088	141	0.02103	133	0.025322
91	0.052403	88	0.0559	144	0.014546	155	0.018524
84	0.041954	93	0.035068	127	0.037715	142	0.038782
91	0.052403	95	0.025088	139	0.025635	141	0.038417
101	0.015252	79	0.034042	125	0.035189	122	0.005305
84	0.041954	90	0.049433	138	0.0279	157	0.014344
89	0.053878	79	0.034042	115	0.014032	138	0.035277
87	0.051493	96	0.020556	141	0.02103	157	0.014344
101	0.015252	85	0.057339	140	0.02333	158	0.012444
100	0.018733	93	0.035068	117	0.018203	141	0.038417
95	0.03982	76	0.019703	130	0.038956	131	0.020754
86	0.04898	83	0.052456	136	0.032117	154	0.020754
77	0.01373	91	0.045032	114	0.012144	148	0.033645
98	0.026754	81	0.044088	136	0.032117	144	0.038417
94	0.043834	93	0.035068	117	0.018203	130	0.018524
100	0.018733	94	0.029977	129	0.038907	147	0.035277
78	0.017012	80	0.039153	124	0.033507	132	0.023034
91	0.052403	75	0.015739	112	0.00884	135	0.029747
83	0.03778	78	0.028978	135	0.033968	140	0.037696
89	0.053878	91	0.045032	144	0.014546	135	0.029747
77	0.01373	92	0.040162	143	0.016606	132	0.023034
90	0.053623	91	0.045032	140	0.02333	156	0.016378
93	0.047379	84	0.055428	116	0.016058	142	0.038782
90	0.053623	86	0.058073	137	0.030078	146	0.03664
78	0.017012	94	0.029977	142	0.018777	148	0.033645
85	0.045747	97	0.01649	124	0.033507	132	0.023034
93	0.047379	79	0.034042	145	0.012621	126	0.010694
89	0.053878	92	0.040162	118	0.020438	146	0.03664
96	0.035519	86	0.058073	130	0.038956	150	0.029747

81	0.029003	82	0.048602	116	0.016058	148	0.033645
90	0.053623	94	0.029977	124	0.033507	144	0.038417
86	0.04898	71	0.005184	136	0.032117	137	0.033645
90	0.053623	93	0.035068	144	0.014546	146	0.03664
97	0.03111	89	0.053127	142	0.018777	143	0.038782
82	0.033406	82	0.048602	112	0.00884	149	0.031786
99	0.022593	79	0.034042	119	0.022729	147	0.035277
85	0.045747	85	0.057339	129	0.038907	138	0.035277
81	0.029003	89	0.053127	113	0.010411	146	0.03664
90	0.053623	81	0.044088	139	0.025635	125	0.009103
83	0.03778	89	0.053127	128	0.03849	157	0.014344
82	0.033406	85	0.057339	126	0.036605	124	0.007676
100	0.018733	97	0.01649	130	0.038956	149	0.031786
91	0.052403	76	0.019703	130	0.038956	151	0.027576
95	0.03982	94	0.029977	140	0.02333	129	0.016378
84	0.041954	89	0.053127	120	0.025038	156	0.016378
94	0.043834	75	0.015739	114	0.012144	153	0.023034
83	0.03778	97	0.01649	128	0.03849	158	0.012444
92	0.050285	77	0.024149	115	0.014032	133	0.025322
85	0.045747	90	0.049433	117	0.018203	158	0.012444
80	0.024725	89	0.053127	136	0.032117	130	0.018524
93	0.047379	84	0.055428	128	0.03849	132	0.023034
92	0.050285	78	0.028978	126	0.036605	129	0.016378
98	0.026754	88	0.0559	138	0.0279	143	0.038782
99	0.022593	77	0.024149	118	0.020438	130	0.018524
100	0.018733	90	0.049433	130	0.038956	130	0.018524
94	0.043834	75	0.015739	137	0.030078	147	0.035277
98	0.026754	95	0.025088	137	0.030078	137	0.033645
101	0.015252	88	0.0559	139	0.025635	136	0.031786
87	0.051493	77	0.024149	144	0.014546	143	0.038782
80	0.024725	95	0.025088	123	0.031603	144	0.038417
86	0.04898	80	0.039153	136	0.032117	148	0.033645
100	0.018733	85	0.057339	140	0.02333	133	0.025322
78	0.017012	78	0.028978	119	0.022729	149	0.031786
94	0.043834	86	0.058073	112	0.00884	139	0.03664
85	0.045747	97	0.01649	137	0.030078	128	0.014344
87	0.051493	94	0.029977	125	0.035189	122	0.005305
96	0.035519	89	0.053127	128	0.03849	134	0.027576
83	0.03778	85	0.057339	125	0.035189	156	0.016378
91	0.052403	78	0.028978	135	0.033968	156	0.016378
81	0.029003	91	0.045032	140	0.02333	145	0.037696
88	0.053155	89	0.053127	138	0.0279	143	0.038782
98	0.026754	90	0.049433	129	0.038907	158	0.012444
86	0.04898	80	0.039153	144	0.014546	148	0.033645
99	0.022593	95	0.025088	139	0.025635	155	0.018524
79	0.020697	75	0.015739	122	0.029523	138	0.035277
86	0.04898	78	0.028978	138	0.0279	129	0.016378

78	0.017012	77	0.024149	117	0.018203	156	0.016378
77	0.01373	76	0.019703	137	0.030078	140	0.037696
95	0.03982	80	0.039153	113	0.010411	157	0.014344
87	0.051493	93	0.035068	114	0.012144	152	0.025322
77	0.01373	76	0.019703	127	0.037715	141	0.038417
101	0.015252	96	0.020556	143	0.016606	153	0.023034
99	0.022593	88	0.0559	137	0.030078	157	0.014344
101	0.015252	92	0.040162	121	0.027318	131	0.020754
100	0.018733	87	0.057583	121	0.027318	138	0.035277
77	0.01373	77	0.024149	148	0.007785	153	0.023034
100	0.018733	91	0.045032	125	0.035189	142	0.038782

MODEL-13

Appendix 13
INPUT

A	B	C	D	E	F	G	H
20	27	34	56	71	82	119	111
18	29	35	56	80	69	105	111
21	29	36	56	73	75	101	117
22	29	34	57	73	73	114	118
20	29	38	61	73	67	121	119
20	27	34	63	72	72	102	133
21	30	40	57	72	80	110	114
22	31	33	59	71	77	114	115
22	31	37	58	77	70	111	124
21	28	33	53	79	71	116	125
22	27	40	55	73	68	116	118
18	31	37	63	79	73	107	117
20	26	41	55	79	73	123	121
22	27	37	56	73	81	107	115
21	30	33	54	73	67	120	132
22	32	41	54	79	70	118	127
19	30	39	62	69	68	119	127
21	26	38	52	73	78	118	131
19	29	33	52	71	75	120	113
21	26	37	54	80	71	105	124
22	30	36	59	82	70	109	128
22	32	37	55	72	77	115	116
18	29	33	58	72	76	122	132
19	30	36	62	82	78	112	117
22	28	38	62	73	70	102	128
20	27	41	64	75	80	118	132
18	26	35	64	73	69	110	133
19	32	36	63	79	79	108	121
21	27	39	57	78	74	118	117
19	29	34	61	74	76	113	114
18	30	40	52	77	72	102	119
20	27	35	59	70	69	110	114
20	26	37	53	69	70	107	118
21	27	35	64	84	78	122	124
21	27	36	59	79	73	114	113
20	28	38	60	73	78	111	131
22	28	38	58	84	80	106	126
21	31	34	52	70	68	105	113
19	32	39	56	79	72	104	131
20	31	38	56	75	68	118	114
21	29	36	63	75	81	111	119

Appendix 13.1
OUTPUT

SR.NO.	A	B	C	D	E	F	G	H
1	22	30	38	62	79	90	130	123
2	20	32	39	62	88	77	116	123
3	23	32	40	62	81	83	112	129
4	24	32	38	63	81	81	125	130
5	22	32	42	67	81	75	132	131
6	22	30	38	69	81	80	113	145
7	23	33	44	63	80	88	121	126
8	24	34	37	65	79	85	125	127
9	24	34	41	64	85	78	122	136
10	23	31	37	59	87	79	127	137
11	24	30	44	61	81	76	127	130
12	20	34	41	69	87	81	118	129
13	22	29	45	61	87	81	134	133
14	24	30	41	62	81	89	118	127
15	23	33	37	60	81	75	131	144
16	24	35	45	60	87	78	129	139
17	21	33	43	68	77	76	130	139
18	23	29	42	58	81	86	129	143
19	21	32	37	58	79	83	131	125
20	23	29	41	60	88	79	116	136
21	24	33	40	65	90	78	120	140
22	24	35	41	61	80	85	126	128
23	20	32	37	64	80	84	133	144
24	21	33	40	68	90	86	123	129
25	24	31	42	68	81	78	113	140
26	22	30	45	70	83	88	129	144
27	20	29	39	70	81	77	121	145
28	21	35	40	69	87	87	119	133
29	23	30	43	63	86	82	129	129
30	21	32	38	67	82	84	124	126
31	20	33	44	58	85	80	113	131
32	22	30	39	65	78	77	121	126
33	22	29	41	59	77	78	118	130
34	23	30	39	70	92	86	133	136
35	23	30	40	65	87	81	125	125
36	22	31	42	66	81	86	122	143
37	24	31	42	64	92	88	117	138
38	23	34	38	58	78	76	116	125
39	21	35	43	62	87	80	115	143
40	22	34	42	62	83	76	129	126
41	23	32	40	69	83	89	122	131

22	32	36	64	84	68	113	131
20	32	37	61	83	70	107	117
21	30	40	60	71	70	104	121
22	29	34	56	75	69	102	121
21	30	33	57	70	70	118	125
20	32	38	54	80	75	104	110
18	26	41	58	82	82	119	132
21	29	39	53	78	67	116	126
22	28	35	62	72	81	114	116
18	32	36	59	75	78	123	115
19	32	35	59	72	79	118	127
19	26	38	53	82	67	104	124
20	30	37	53	75	71	119	124
18	31	41	53	74	82	110	117
21	27	38	60	70	79	113	111
21	28	37	54	78	73	122	132
22	27	38	59	77	77	109	114
22	31	38	62	70	68	103	121
20	29	36	58	84	78	102	123
18	30	38	63	69	74	101	125
21	27	33	63	75	71	109	127
22	30	39	62	78	70	123	131
19	30	37	63	75	80	122	129
22	30	35	55	69	82	106	112
22	28	37	56	74	73	106	111
18	27	39	56	69	67	119	121
18	28	35	54	85	82	103	126
21	30	34	63	81	74	108	113
20	32	35	58	75	74	114	111
19	29	34	64	75	71	123	124
20	29	39	54	84	82	102	117
20	28	39	54	81	76	115	112
19	31	35	60	77	76	104	115
19	28	33	56	79	75	111	114
21	31	33	63	84	77	102	113
18	32	35	64	84	72	117	134
18	26	37	55	78	80	115	131
21	30	39	62	83	67	112	120
20	27	35	64	73	71	105	131
20	26	40	60	84	75	109	130
22	27	33	53	74	77	116	116
22	28	40	54	70	71	102	126
19	28	37	56	69	74	105	129
19	30	35	56	69	79	112	126
22	31	37	61	71	76	120	110
19	27	36	53	84	71	120	123
21	29	41	59	72	81	114	125

42	24	35	40	70	92	76	124	143
43	22	35	41	67	91	78	118	129
44	23	33	44	66	79	78	115	133
45	24	32	38	62	83	77	113	133
46	23	33	37	63	78	78	129	137
47	22	35	42	60	88	83	115	122
48	20	29	45	64	90	90	130	144
49	23	32	43	59	86	75	127	138
50	24	31	39	68	80	89	125	128
51	20	35	40	65	83	86	134	127
52	21	35	39	65	80	87	129	139
53	21	29	42	59	90	75	115	136
54	22	33	41	59	83	79	130	136
55	20	34	45	59	82	90	121	129
56	23	30	42	66	78	87	124	123
57	23	31	41	60	86	81	133	144
58	24	30	42	65	85	85	120	126
59	24	34	42	68	78	76	114	133
60	22	32	40	64	92	86	113	135
61	20	33	42	69	77	82	112	137
62	23	30	37	69	83	79	120	139
63	24	33	43	68	86	78	134	143
64	21	33	41	69	83	88	133	141
65	24	33	39	61	77	90	117	124
66	24	31	41	62	82	81	117	123
67	20	30	43	62	77	75	130	133
68	20	31	39	60	93	90	114	138
69	23	33	38	69	89	82	119	125
70	22	35	39	64	83	82	125	123
71	21	32	38	70	83	79	134	136
72	22	32	43	60	92	90	113	129
73	22	31	43	60	89	84	126	124
74	21	34	39	66	85	84	115	127
75	21	31	37	62	87	83	122	126
76	23	34	37	69	92	85	113	125
77	20	35	39	70	92	80	128	146
78	20	29	41	61	86	88	126	143
79	23	33	43	68	91	75	123	132
80	22	30	39	70	81	79	116	143
81	22	29	44	66	92	83	120	142
82	24	30	37	59	82	85	127	128
83	24	31	44	60	78	79	113	138
84	21	31	41	62	77	82	116	141
85	21	33	39	62	77	87	123	138
86	24	34	41	67	79	84	131	122
87	21	30	40	59	92	79	131	135
88	23	32	45	65	80	89	125	137

21	28	40	54	84	67	119	126		89	23	31	44	60	92	75	130	138
21	27	37	56	83	77	120	122		90	23	30	41	62	91	85	131	134
20	28	33	54	82	82	117	133		91	22	31	37	60	90	90	128	145
19	29	39	59	76	72	121	122		92	21	32	43	65	84	80	132	134
20	31	37	60	85	78	105	111		93	22	34	41	66	93	86	116	123
22	26	37	59	85	71	113	113		94	24	29	41	65	93	79	124	125
21	27	37	52	70	74	110	121		95	23	30	41	58	78	82	121	133
22	29	33	59	76	77	102	128		96	24	32	37	65	84	85	113	140
19	29	37	62	70	68	116	134		97	21	32	41	68	78	76	127	146
22	30	37	54	78	79	112	133		98	24	33	41	60	86	87	123	145
19	29	34	56	85	76	121	115		99	21	32	38	62	93	84	132	127
19	27	33	53	82	77	121	125		100	21	30	37	59	90	85	132	157

Mean	22.3	31.9	40.6	63.8	84.4	82.2	123	134
S.D	1.36	1.85	2.35	3.73	5.02	4.61	6.72	7.52
CoV	6.12	5.8	5.79	5.84	5.96	5.61	5.46	5.62 %

Appendix 13.2

A	ND	B	ND	C	ND	D	ND
21	0.2871644	33	0.12726261	40	0.0912034	61	0.094753
20	0.073059	31	0.21527503	37	0.1338062	61	0.094753
22	0.2536891	32	0.21527503	40	0.16384	59	0.094753
22	0.1307479	32	0.21527503	37	0.0912034	59	0.104347
20	0.2871644	29	0.21527503	41	0.1428051	61	0.07472
21	0.2871644	29	0.12726261	41	0.0912034	62	0.041054
22	0.2536891	31	0.18067416	38	0.0603924	58	0.104347
22	0.1307479	30	0.11323197	41	0.0518829	59	0.101971
21	0.1307479	30	0.11323197	39	0.1674336	58	0.106932
20	0.2536891	32	0.19154108	38	0.0518829	61	0.046065
21	0.1307479	30	0.12726261	39	0.0603924	61	0.080065
21	0.073059	33	0.11323197	38	0.1674336	62	0.041054
22	0.2871644	33	0.06314084	38	0.0299447	64	0.080065
22	0.1307479	33	0.12726261	37	0.1674336	58	0.094753
21	0.2536891	33	0.18067416	38	0.0518829	62	0.062956
20	0.1307479	30	0.0529923	37	0.0299447	60	0.062956
21	0.1896362	33	0.18067416	38	0.1016538	58	0.057415
20	0.2536891	29	0.06314084	39	0.1428051	62	0.031365
20	0.1896362	30	0.21527503	41	0.0518829	61	0.031365
21	0.2536891	30	0.06314084	41	0.1674336	61	0.062956
22	0.1307479	31	0.18067416	40	0.16384	61	0.101971
21	0.1307479	31	0.0529923	38	0.1674336	62	0.080065
22	0.073059	29	0.21527503	41	0.0518829	62	0.106932
20	0.1896362	30	0.18067416	37	0.16384	64	0.057415
22	0.1307479	33	0.19154108	37	0.1428051	58	0.057415
22	0.2871644	32	0.12726261	39	0.0299447	58	0.027317
21	0.073059	33	0.06314084	39	0.1338062	63	0.027317
22	0.1896362	30	0.0529923	37	0.16384	60	0.041054
21	0.2536891	30	0.12726261	39	0.1016538	61	0.104347
20	0.1896362	31	0.21527503	40	0.0912034	60	0.07472
21	0.073059	32	0.18067416	41	0.0603924	58	0.031365
22	0.2871644	33	0.12726261	37	0.1338062	59	0.101971
21	0.2871644	30	0.06314084	37	0.1674336	60	0.046065
20	0.2536891	33	0.12726261	41	0.1338062	62	0.027317
22	0.2536891	30	0.12726261	40	0.16384	63	0.101971
20	0.2871644	29	0.19154108	39	0.1428051	59	0.090487
22	0.1307479	33	0.19154108	37	0.1428051	62	0.106932
20	0.2536891	32	0.11323197	38	0.0912034	59	0.031365
20	0.1896362	32	0.0529923	41	0.1016538	64	0.094753
20	0.2871644	31	0.11323197	37	0.1428051	59	0.094753
21	0.2536891	29	0.21527503	39	0.16384	59	0.041054

20	0.1307479	29	0.0529923	41	0.16384	64	0.027317
21	0.2871644	32	0.0529923	40	0.1674336	60	0.07472
21	0.2536891	31	0.18067416	40	0.0603924	59	0.090487
22	0.1307479	31	0.21527503	37	0.0912034	63	0.094753
20	0.2536891	29	0.18067416	37	0.0518829	64	0.104347
21	0.2871644	33	0.0529923	37	0.1428051	61	0.062956
20	0.073059	32	0.06314084	38	0.0299447	59	0.106932
20	0.2536891	29	0.21527503	38	0.1016538	61	0.046065
20	0.1307479	30	0.19154108	38	0.1338062	62	0.057415
22	0.073059	29	0.0529923	39	0.16384	61	0.101971
21	0.1896362	30	0.0529923	37	0.1338062	61	0.101971
20	0.1896362	31	0.06314084	37	0.1428051	63	0.046065
21	0.2871644	32	0.18067416	38	0.1674336	64	0.046065
20	0.073059	32	0.11323197	40	0.0299447	61	0.046065
20	0.2536891	29	0.12726261	39	0.1428051	59	0.090487
22	0.2536891	31	0.19154108	39	0.1674336	60	0.062956
20	0.1307479	30	0.12726261	37	0.1428051	58	0.101971
21	0.1307479	29	0.11323197	40	0.1428051	60	0.057415
20	0.2871644	30	0.21527503	39	0.16384	63	0.106932
21	0.073059	31	0.18067416	40	0.1428051	63	0.041054
21	0.2536891	30	0.12726261	39	0.0518829	61	0.041054
21	0.1307479	31	0.18067416	41	0.1016538	64	0.057415
20	0.1896362	33	0.18067416	38	0.1674336	63	0.041054
22	0.1307479	29	0.18067416	38	0.1338062	62	0.080065
21	0.1307479	33	0.19154108	39	0.1674336	59	0.094753
22	0.073059	33	0.12726261	41	0.1016538	58	0.094753
21	0.073059	33	0.19154108	38	0.1338062	62	0.062956
21	0.2536891	30	0.18067416	41	0.0912034	62	0.041054
20	0.2871644	31	0.0529923	38	0.1338062	59	0.106932
20	0.1896362	31	0.21527503	41	0.0912034	60	0.027317
21	0.2871644	33	0.21527503	38	0.1016538	63	0.062956
22	0.2871644	33	0.19154108	40	0.1016538	61	0.062956
22	0.1896362	33	0.11323197	40	0.1338062	63	0.090487
22	0.1896362	30	0.19154108	40	0.0518829	62	0.094753
22	0.2536891	33	0.11323197	40	0.0518829	64	0.041054
22	0.073059	29	0.0529923	39	0.1338062	63	0.027317
21	0.073059	30	0.06314084	39	0.1674336	59	0.080065
22	0.2536891	33	0.18067416	40	0.1016538	64	0.057415
22	0.2871644	30	0.12726261	37	0.1338062	58	0.027317
22	0.2871644	30	0.06314084	38	0.0603924	63	0.090487
22	0.1307479	31	0.12726261	39	0.0518829	58	0.046065
20	0.1307479	33	0.19154108	38	0.0603924	61	0.062956
20	0.1896362	29	0.19154108	38	0.1674336	58	0.094753
22	0.1896362	32	0.18067416	41	0.1338062	60	0.094753
21	0.1307479	32	0.11323197	41	0.1674336	59	0.07472
21	0.1896362	32	0.12726261	41	0.16384	62	0.046065
22	0.2536891	33	0.21527503	41	0.0299447	62	0.101971

21	0.2536891	32	0.19154108	37	0.0603924	62	0.062956
20	0.2536891	31	0.12726261	41	0.1674336	61	0.094753
20	0.2871644	33	0.19154108	39	0.0518829	63	0.062956
21	0.1896362	32	0.21527503	39	0.1016538	62	0.101971
20	0.2871644	31	0.11323197	41	0.1674336	58	0.090487
20	0.1307479	31	0.06314084	39	0.1674336	62	0.101971
20	0.2536891	32	0.12726261	41	0.1674336	59	0.031365
21	0.1307479	33	0.21527503	40	0.0518829	59	0.101971
20	0.1896362	29	0.21527503	41	0.1674336	59	0.057415
21	0.1307479	30	0.18067416	40	0.1674336	59	0.062956
21	0.1896362	33	0.21527503	40	0.0912034	62	0.094753
21	0.1896362	31	0.12726261	39	0.0518829	61	0.046065

E	ND		F	ND		G	ND		H	ND	
	77	0.045042		80	0.020537		117	0.035312		129	0.018758
	81	0.060989		83	0.046033		116	0.033709		124	0.018758
	80	0.063579		80	0.085165		117	0.014999		129	0.043142
	79	0.063579		77	0.083735		119	0.057135		132	0.046588
	83	0.063579		83	0.025738		117	0.02495		125	0.049426
	77	0.063579		81	0.077372		117	0.018985		130	0.017625
	82	0.054585		78	0.039009		121	0.056381		134	0.030807
	77	0.045042		83	0.071763		124	0.057135		134	0.035082
	81	0.078747		75	0.057368		114	0.058478		124	0.050936
	79	0.069095		81	0.068209		120	0.050365		134	0.048593
	83	0.063579		81	0.03524		116	0.050365		126	0.046588
	82	0.069095		81	0.083735		115	0.044251		122	0.043142
	84	0.069095		79	0.083735		113	0.016135		134	0.052754
	81	0.063579		77	0.028977		124	0.044251		124	0.035082
	78	0.063579		83	0.025738		121	0.030012		128	0.021286
	79	0.069095		78	0.057368		112	0.040638		122	0.041937
	85	0.027233		75	0.03524		113	0.035312		126	0.041937
	83	0.063579		75	0.061388		121	0.040638		126	0.025256
	85	0.045042		76	0.085165		122	0.030012		123	0.026578
	83	0.060989		83	0.068209		117	0.033709		129	0.050936
	85	0.042192		76	0.057368		122	0.053171		123	0.037938
	81	0.054585		81	0.071763		118	0.05424		124	0.03925
	81	0.054585		79	0.080038		112	0.020287		126	0.021286
	80	0.042192		81	0.061388		115	0.059325		131	0.043142
	79	0.063579		76	0.057368		122	0.018985		131	0.037938
	81	0.076593		81	0.039009		120	0.040638		125	0.021286
	79	0.063579		76	0.046033		116	0.056381		125	0.017625
	85	0.069095		77	0.0501		113	0.049046		130	0.052754
	83	0.075239		83	0.086456		116	0.040638		122	0.043142
	79	0.071179		81	0.080038		113	0.058867		128	0.030807
	77	0.078747		76	0.077372		117	0.018985		134	0.049426
	85	0.035724		79	0.046033		114	0.056381		124	0.030807
	80	0.027233		76	0.057368		117	0.044251		130	0.046588
	79	0.02491		77	0.061388		123	0.020287		130	0.050936
	77	0.069095		78	0.083735		114	0.057135		134	0.026578
	81	0.063579		82	0.061388		115	0.058478		123	0.025256
	81	0.02491		77	0.039009		119	0.039051		124	0.045544
	79	0.035724		78	0.03524		120	0.033709		128	0.026578
	84	0.069095		77	0.077372		122	0.02846		131	0.025256
	83	0.076593		82	0.03524		120	0.040638		123	0.030807
	80	0.076593		82	0.028977		124	0.058478		127	0.049426

83	0.02491	82	0.03524	114	0.058867	127	0.025256
85	0.033068	80	0.057368	114	0.044251	134	0.043142
79	0.045042	78	0.057368	122	0.02846	124	0.052754
80	0.076593	82	0.046033	118	0.018985	126	0.052754
79	0.035724	80	0.057368	118	0.040638	126	0.048593
78	0.060989	79	0.085165	117	0.02846	126	0.015346
79	0.042192	76	0.020537	118	0.035312	130	0.021286
77	0.075239	76	0.025738	114	0.050365	132	0.045544
85	0.054585	77	0.028977	120	0.057135	126	0.03925
80	0.076593	83	0.061388	116	0.016135	127	0.035082
82	0.054585	80	0.0501	120	0.040638	127	0.041937
82	0.042192	80	0.025738	123	0.02846	126	0.050936
83	0.076593	75	0.068209	123	0.035312	123	0.050936
84	0.071179	75	0.020537	123	0.056381	131	0.043142
85	0.035724	77	0.0501	113	0.058867	129	0.018758
80	0.075239	83	0.083735	114	0.020287	126	0.021286
79	0.078747	75	0.071763	122	0.053171	129	0.030807
79	0.035724	75	0.03524	114	0.023503	126	0.052754
83	0.02491	81	0.061388	123	0.018985	134	0.052456
81	0.027233	79	0.086456	112	0.014999	129	0.048593
77	0.076593	76	0.068209	124	0.053171	132	0.041937
82	0.075239	75	0.057368	117	0.016135	124	0.025256
84	0.076593	77	0.039009	117	0.020287	125	0.033718
81	0.027233	82	0.020537	113	0.039051	129	0.022527
83	0.071179	78	0.083735	121	0.039051	128	0.018758
79	0.027233	82	0.025738	113	0.035312	130	0.052754
79	0.018036	78	0.020537	112	0.023503	130	0.045544
80	0.051742	82	0.086456	122	0.049046	134	0.026578
78	0.076593	80	0.086456	119	0.057135	130	0.018758
77	0.076593	81	0.068209	114	0.016135	123	0.050936
79	0.02491	80	0.020537	114	0.018985	128	0.043142
82	0.051742	77	0.080038	115	0.05424	122	0.022527
85	0.078747	75	0.080038	122	0.02846	126	0.035082
80	0.069095	80	0.085165	120	0.058478	126	0.030807
80	0.02491	76	0.071763	122	0.018985	124	0.026578
80	0.02491	81	0.077372	121	0.045744	130	0.014337
77	0.075239	82	0.039009	112	0.05424	130	0.025256
81	0.033068	82	0.025738	123	0.059325	129	0.051517
81	0.063579	82	0.068209	120	0.033709	131	0.025256
79	0.02491	80	0.085165	123	0.053171	129	0.029442
79	0.071179	83	0.071763	116	0.050365	122	0.03925
85	0.035724	77	0.068209	121	0.018985	129	0.045544
79	0.027233	76	0.086456	118	0.033709	128	0.033718
81	0.027233	78	0.0501	121	0.059325	131	0.045544
80	0.045042	78	0.080038	113	0.030012	124	0.015346
84	0.02491	75	0.068209	123	0.030012	123	0.052456
85	0.054585	76	0.028977	121	0.057135	126	0.048593

84	0.02491	80	0.025738	115	0.035312	125	0.045544
83	0.033068	80	0.071763	116	0.030012	123	0.053072
78	0.042192	82	0.020537	122	0.045744	132	0.017625
80	0.079216	83	0.077372	115	0.02495	124	0.053072
81	0.018036	82	0.061388	116	0.033709	122	0.018758
82	0.018036	77	0.068209	119	0.058867	129	0.026578
79	0.035724	75	0.086456	122	0.056381	126	0.052754
84	0.079216	77	0.071763	120	0.018985	131	0.037938
79	0.035724	76	0.03524	116	0.050365	133	0.014337
81	0.075239	79	0.0501	123	0.059325	131	0.017625
83	0.018036	83	0.080038	122	0.02495	128	0.035082
84	0.042192	75	0.071763	123	0.02495	132	0.00046

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Appendix 14
INPUT

A	B	C	D	E	F	G	H
20	31	38	58	73	76	111	123
19	29	35	58	77	79	110	118
21	30	38	56	76	76	111	123
21	30	35	56	75	73	113	126
19	27	39	58	79	79	111	119
20	27	39	59	73	77	111	124
21	29	36	55	78	74	115	128
21	28	39	56	73	79	118	128
20	28	37	55	77	71	108	118
19	30	36	58	75	77	114	128
20	28	37	58	79	77	110	120
20	31	36	59	78	77	109	116
21	31	36	61	80	75	107	128
21	31	35	55	77	73	118	118
20	31	36	59	74	79	115	122
19	28	35	57	75	74	106	116
20	31	36	55	81	71	107	120
19	27	37	59	79	71	115	120
19	28	39	58	81	72	116	117
20	28	39	58	79	79	111	123
21	29	38	58	81	72	116	117
20	29	36	59	77	77	112	118
21	27	39	59	77	75	106	120
19	28	35	61	76	77	109	125
21	31	35	55	75	72	116	125
21	30	37	55	77	77	114	119
20	31	37	60	75	72	110	119
21	28	35	57	81	73	107	124
20	28	37	58	79	79	110	116
19	29	38	57	75	77	107	122
20	30	39	55	73	72	111	128
21	31	35	56	81	75	108	118
20	28	35	57	76	72	111	124
19	31	39	59	75	73	117	124
21	28	38	60	73	74	108	128
19	27	37	56	77	78	109	117
21	31	35	59	77	73	113	118
19	30	36	56	75	74	114	122
19	30	39	61	80	73	116	125
19	29	35	56	79	78	114	117
20	27	37	56	76	78	118	121

Appendix 14.1
OUTPUT

SR.NO.	A	B	C	D	E	F	G	H
1	21	33	40	61	77	80	117	129
2	20	31	37	61	81	83	116	124
3	22	32	40	59	80	80	117	129
4	22	32	37	59	79	77	119	132
5	20	29	41	61	83	83	117	125
6	21	29	41	62	77	81	117	130
7	22	31	38	58	82	78	121	134
8	22	30	41	59	77	83	124	134
9	21	30	39	58	81	75	114	124
10	20	32	38	61	79	81	120	134
11	21	30	39	61	83	81	116	126
12	21	33	38	62	82	81	115	122
13	22	33	38	64	84	79	113	134
14	22	33	37	58	81	77	124	124
15	21	33	38	62	78	83	121	128
16	20	30	37	60	79	78	112	122
17	21	33	38	58	85	75	113	126
18	20	29	39	62	83	75	121	126
19	20	30	41	61	85	76	122	123
20	21	30	41	61	83	83	117	129
21	22	31	40	61	85	76	122	123
22	21	31	38	62	81	81	118	124
23	22	29	41	62	81	79	112	126
24	20	30	37	64	80	81	115	131
25	22	33	37	58	79	76	122	131
26	22	32	39	58	81	81	120	125
27	21	33	39	63	79	76	116	125
28	22	30	37	60	85	77	113	130
29	21	30	39	61	83	83	116	122
30	20	31	40	60	79	81	113	128
31	21	32	41	58	77	76	117	134
32	22	33	37	59	85	79	114	124
33	21	30	37	60	80	76	117	130
34	20	33	41	62	79	77	123	130
35	22	30	40	63	77	78	114	134
36	20	29	39	59	81	82	115	123
37	22	33	37	62	81	77	119	124
38	20	32	38	59	79	78	120	128
39	20	32	41	64	84	77	122	131
40	20	31	37	59	83	82	120	123
41	21	29	39	59	80	82	124	127

19	27	39	61	79	78	108	121
20	30	38	57	81	76	108	128
20	29	38	56	75	74	116	118
21	29	35	60	76	78	112	120
19	27	35	61	75	76	112	120
20	31	35	58	74	75	111	120
19	30	36	56	75	72	112	124
19	27	36	58	73	72	108	126
19	28	36	59	81	73	114	120
21	27	37	58	76	79	110	121
20	28	35	58	78	76	114	121
19	29	35	60	78	76	107	120
20	30	36	61	79	71	117	117
19	30	38	58	80	71	117	125
19	27	37	56	81	73	107	123
21	29	37	57	76	79	108	120
19	28	35	55	75	71	116	123
20	27	38	57	75	71	108	120
19	28	37	60	79	77	117	128
20	29	38	60	77	75	106	123
20	28	37	58	73	72	118	126
20	29	39	61	78	71	111	118
19	31	36	60	80	73	111	119
21	27	36	59	77	78	107	123
20	31	37	56	79	74	115	122
21	31	39	55	75	78	107	124
20	31	36	59	75	74	106	124
20	28	39	59	76	78	116	128
19	29	36	56	74	76	113	124
19	29	39	57	73	77	108	117
20	31	36	60	75	76	108	122
21	31	38	58	78	73	109	116
21	31	38	60	81	71	116	120
21	28	38	59	76	76	114	120
21	31	38	61	76	72	116	118
21	27	37	60	76	77	115	124
20	28	37	56	73	78	106	124
21	31	38	61	77	78	117	123
21	28	35	55	77	78	114	125
21	28	36	60	75	76	117	123
21	29	37	55	75	79	110	116
19	31	36	58	81	73	115	123
19	27	36	55	75	72	112	122
21	30	39	57	77	74	115	125
20	30	39	56	76	74	107	118
20	30	39	59	80	71	117	117
21	31	39	59	81	72	115	120

42	20	29	41	64	83	82	114	127
43	21	32	40	60	85	80	114	134
44	21	31	40	59	79	78	122	124
45	22	31	37	63	80	82	118	126
46	20	29	37	64	79	80	118	126
47	21	33	37	61	78	79	117	126
48	20	32	38	59	79	76	118	130
49	20	29	38	61	77	76	114	132
50	20	30	38	62	85	77	120	126
51	22	29	39	61	80	83	116	127
52	21	30	37	61	82	80	120	127
53	20	31	37	63	82	80	123	126
54	21	32	38	64	83	75	123	123
55	20	32	40	61	84	75	123	131
56	20	29	39	59	85	77	113	129
57	22	31	39	60	80	83	114	126
58	20	30	37	58	79	75	122	129
59	21	29	40	60	79	75	114	126
60	20	30	39	63	83	81	123	134
61	21	31	40	63	81	79	112	129
62	21	30	39	61	77	76	124	132
63	21	31	41	64	82	75	117	124
64	20	33	38	63	84	77	117	125
65	22	29	38	62	81	82	113	129
66	21	33	39	59	83	78	121	128
67	22	33	41	58	79	82	113	130
68	21	33	38	62	79	78	112	130
69	21	30	41	62	80	82	122	134
70	20	31	38	59	78	80	119	130
71	20	31	41	60	77	81	114	123
72	21	33	38	63	79	80	114	128
73	22	33	40	61	82	77	115	122
74	22	33	40	63	85	75	122	126
75	22	30	40	62	80	80	120	126
76	22	33	40	64	80	76	122	124
77	22	29	39	63	80	81	121	130
78	21	30	39	59	77	82	112	130
79	22	33	40	64	81	82	123	129
80	22	30	37	58	81	82	120	131
81	22	30	38	63	79	80	123	129
82	22	31	39	58	79	83	116	122
83	20	33	38	61	85	77	121	129
84	20	29	38	58	79	76	118	128
85	22	32	41	60	81	78	121	131
86	21	32	41	59	80	78	113	124
87	21	32	41	62	84	75	123	123
88	22	33	41	62	85	76	121	126

20	30	35	59	80	76	109	119
19	29	39	58	79	76	110	117
19	31	37	60	74	78	116	126
20	30	37	59	76	79	109	118
19	29	39	55	77	78	110	116
19	29	37	59	78	73	113	123
19	30	39	56	75	71	116	120
20	31	38	56	80	73	114	125
19	27	39	56	75	72	110	127
20	28	38	56	77	75	117	125
20	31	38	59	79	79	116	122
20	29	37	58	80	71	117	126

89	21	32	37	62	84	80	115	125
90	20	31	41	61	83	80	116	123
91	20	33	39	63	78	82	122	132
92	21	32	39	62	80	83	115	124
93	20	31	41	58	81	82	116	122
94	20	31	39	62	82	77	119	129
95	20	32	41	59	79	75	122	126
96	21	33	40	59	84	77	120	131
97	20	29	41	59	79	76	116	133
98	21	30	40	59	81	79	123	131
99	21	33	40	62	83	83	122	128
100	21	31	39	61	84	75	123	132

Mean	21	31	39	61	81	79	118	128
S.D	0.8	1.4	1.4	1.9	2.42	2.69	3.7	3.54
CoV	3.8	4.6	3.7	3.1	2.99	3.41	3.1	2.77 %

Appendix 14.2

A	ND	B	ND	C	ND	D	ND
21	0.4961836	33	0.12127543	40	0.2228775	61	0.21218
20	0.243131	31	0.27590104	37	0.1006886	61	0.21218
22	0.2147641	32	0.23294712	40	0.2228775	59	0.131464
22	0.2147641	32	0.23294712	37	0.1006886	59	0.131464
20	0.243131	29	0.09073601	41	0.1089088	61	0.21218
21	0.4961836	29	0.09073601	41	0.1089088	62	0.175804
22	0.2147641	31	0.27590104	38	0.2143014	58	0.067489
22	0.2147641	30	0.20149338	41	0.1089088	59	0.131464
21	0.4961836	30	0.20149338	39	0.2792889	58	0.067489
20	0.243131	32	0.23294712	38	0.2143014	61	0.21218
21	0.4961836	30	0.20149338	39	0.2792889	61	0.21218
21	0.4961836	33	0.12127543	38	0.2143014	62	0.175804
22	0.2147641	33	0.12127543	38	0.2143014	64	0.051338
22	0.2147641	33	0.12127543	37	0.1006886	58	0.067489
21	0.4961836	33	0.12127543	38	0.2143014	62	0.175804
20	0.243131	30	0.20149338	37	0.1006886	60	0.192588
21	0.4961836	33	0.12127543	38	0.2143014	58	0.067489
20	0.243131	29	0.09073601	39	0.2792889	62	0.175804
20	0.243131	30	0.20149338	41	0.1089088	61	0.21218
21	0.4961836	30	0.20149338	41	0.1089088	61	0.21218
22	0.2147641	31	0.27590104	40	0.2228775	61	0.21218
21	0.4961836	31	0.27590104	38	0.2143014	62	0.175804
22	0.2147641	29	0.09073601	41	0.1089088	62	0.175804
20	0.243131	30	0.20149338	37	0.1006886	64	0.051338
22	0.2147641	33	0.12127543	37	0.1006886	58	0.067489
22	0.2147641	32	0.23294712	39	0.2792889	58	0.067489
21	0.4961836	33	0.12127543	39	0.2792889	63	0.109549
22	0.2147641	30	0.20149338	37	0.1006886	60	0.192588
21	0.4961836	30	0.20149338	39	0.2792889	61	0.21218
20	0.243131	31	0.27590104	40	0.2228775	60	0.192588
21	0.4961836	32	0.23294712	41	0.1089088	58	0.067489
22	0.2147641	33	0.12127543	37	0.1006886	59	0.131464
21	0.4961836	30	0.20149338	37	0.1006886	60	0.192588
20	0.243131	33	0.12127543	41	0.1089088	62	0.175804
22	0.2147641	30	0.20149338	40	0.2228775	63	0.109549
20	0.243131	29	0.09073601	39	0.2792889	59	0.131464
22	0.2147641	33	0.12127543	37	0.1006886	62	0.175804
20	0.243131	32	0.23294712	38	0.2143014	59	0.131464
20	0.243131	32	0.23294712	41	0.1089088	64	0.051338
20	0.243131	31	0.27590104	37	0.1006886	59	0.131464
21	0.4961836	29	0.09073601	39	0.2792889	59	0.131464

20	0.243131	29	0.09073601	41	0.1089088	64	0.051338
21	0.4961836	32	0.23294712	40	0.2228775	60	0.192588
21	0.4961836	31	0.27590104	40	0.2228775	59	0.131464
22	0.2147641	31	0.27590104	37	0.1006886	63	0.109549
20	0.243131	29	0.09073601	37	0.1006886	64	0.051338
21	0.4961836	33	0.12127543	37	0.1006886	61	0.21218
20	0.243131	32	0.23294712	38	0.2143014	59	0.131464
20	0.243131	29	0.09073601	38	0.2143014	61	0.21218
20	0.243131	30	0.20149338	38	0.2143014	62	0.175804
22	0.2147641	29	0.09073601	39	0.2792889	61	0.21218
21	0.4961836	30	0.20149338	37	0.1006886	61	0.21218
20	0.243131	31	0.27590104	37	0.1006886	63	0.109549
21	0.4961836	32	0.23294712	38	0.2143014	64	0.051338
20	0.243131	32	0.23294712	40	0.2228775	61	0.21218
20	0.243131	29	0.09073601	39	0.2792889	59	0.131464
22	0.2147641	31	0.27590104	39	0.2792889	60	0.192588
20	0.243131	30	0.20149338	37	0.1006886	58	0.067489
21	0.4961836	29	0.09073601	40	0.2228775	60	0.192588
20	0.243131	30	0.20149338	39	0.2792889	63	0.109549
21	0.4961836	31	0.27590104	40	0.2228775	63	0.109549
21	0.4961836	30	0.20149338	39	0.2792889	61	0.21218
21	0.4961836	31	0.27590104	41	0.1089088	64	0.051338
20	0.243131	33	0.12127543	38	0.2143014	63	0.109549
22	0.2147641	29	0.09073601	38	0.2143014	62	0.175804
21	0.4961836	33	0.12127543	39	0.2792889	59	0.131464
22	0.2147641	33	0.12127543	41	0.1089088	58	0.067489
21	0.4961836	33	0.12127543	38	0.2143014	62	0.175804
21	0.4961836	30	0.20149338	41	0.1089088	62	0.175804
20	0.243131	31	0.27590104	38	0.2143014	59	0.131464
20	0.243131	31	0.27590104	41	0.1089088	60	0.192588
21	0.4961836	33	0.12127543	38	0.2143014	63	0.109549
22	0.2147641	33	0.12127543	40	0.2228775	61	0.21218
22	0.2147641	33	0.12127543	40	0.2228775	63	0.109549
22	0.2147641	30	0.20149338	40	0.2228775	62	0.175804
22	0.2147641	33	0.12127543	40	0.2228775	64	0.051338
22	0.2147641	29	0.09073601	39	0.2792889	63	0.109549
21	0.4961836	30	0.20149338	39	0.2792889	59	0.131464
22	0.2147641	33	0.12127543	40	0.2228775	64	0.051338
22	0.2147641	30	0.20149338	37	0.1006886	58	0.067489
22	0.2147641	30	0.20149338	38	0.2143014	63	0.109549
22	0.2147641	31	0.27590104	39	0.2792889	58	0.067489
20	0.243131	33	0.12127543	38	0.2143014	61	0.21218
20	0.243131	29	0.09073601	38	0.2143014	58	0.067489
22	0.2147641	32	0.23294712	41	0.1089088	60	0.192588
21	0.4961836	32	0.23294712	41	0.1089088	59	0.131464
21	0.4961836	32	0.23294712	41	0.1089088	62	0.175804
22	0.2147641	33	0.12127543	41	0.1089088	62	0.175804

21	0.4961836	32	0.23294712	37	0.1006886	62	0.175804
20	0.243131	31	0.27590104	41	0.1089088	61	0.21218
20	0.243131	33	0.12127543	39	0.2792889	63	0.109549
21	0.4961836	32	0.23294712	39	0.2792889	62	0.175804
20	0.243131	31	0.27590104	41	0.1089088	58	0.067489
20	0.243131	31	0.27590104	39	0.2792889	62	0.175804
20	0.243131	32	0.23294712	41	0.1089088	59	0.131464
21	0.4961836	33	0.12127543	40	0.2228775	59	0.131464
20	0.243131	29	0.09073601	41	0.1089088	59	0.131464
21	0.4961836	30	0.20149338	40	0.2228775	59	0.131464
21	0.4961836	33	0.12127543	40	0.2228775	62	0.175804
21	0.4961836	31	0.27590104	39	0.2792889	61	0.21218

E	ND		F	ND		G	ND		H	ND	
	77	0.043219		80	0.137235		117	0.103647		129	0.104787
	81	0.164822		83	0.047846		116	0.091927		124	0.06623
	80	0.152372		80	0.137235		117	0.103647		129	0.104787
	79	0.118753		77	0.113948		119	0.105506		132	0.05297
	83	0.115553		83	0.047846		117	0.103647		125	0.085155
	77	0.043219		81	0.110852		117	0.103647		130	0.090407
	82	0.150305		78	0.139138		121	0.079859		134	0.022555
	77	0.043219		83	0.047846		124	0.030174		134	0.022555
	81	0.164822		75	0.050556		114	0.057905		124	0.06623
	79	0.118753		81	0.110852		120	0.095254		134	0.022555
	83	0.115553		81	0.110852		116	0.091927		126	0.101092
	82	0.150305		81	0.110852		115	0.075712		122	0.031535
	84	0.074893		79	0.148035		113	0.041124		134	0.022555
	81	0.164822		77	0.113948		124	0.030174		124	0.06623
	78	0.078026		83	0.047846		121	0.079859		128	0.112141
	79	0.118753		78	0.139138		112	0.027121		122	0.031535
	85	0.040921		75	0.050556		113	0.041124		126	0.101092
	83	0.115553		75	0.050556		121	0.079859		126	0.101092
	85	0.040921		76	0.081311		122	0.062172		123	0.047561
	83	0.115553		83	0.047846		117	0.103647		129	0.104787
	85	0.040921		76	0.081311		122	0.062172		123	0.047561
	81	0.164822		81	0.110852		118	0.108518		124	0.06623
	81	0.164822		79	0.148035		112	0.027121		126	0.101092
	80	0.152372		81	0.110852		115	0.075712		131	0.072018
	79	0.118753		76	0.081311		122	0.062172		131	0.072018
	81	0.164822		81	0.110852		120	0.095254		125	0.085155
	79	0.118753		76	0.081311		116	0.091927		125	0.085155
	85	0.040921		77	0.113948		113	0.041124		130	0.090407
	83	0.115553		83	0.047846		116	0.091927		122	0.031535
	79	0.118753		81	0.110852		113	0.041124		128	0.112141
	77	0.043219		76	0.081311		117	0.103647		134	0.022555
	85	0.040921		79	0.148035		114	0.057905		124	0.06623
	80	0.152372		76	0.081311		117	0.103647		130	0.090407
	79	0.118753		77	0.113948		123	0.044947		130	0.090407
	77	0.043219		78	0.139138		114	0.057905		134	0.022555
	81	0.164822		82	0.07802		115	0.075712		123	0.047561
	81	0.164822		77	0.113948		119	0.105506		124	0.06623
	79	0.118753		78	0.139138		120	0.095254		128	0.112141
	84	0.074893		77	0.113948		122	0.062172		131	0.072018
	83	0.115553		82	0.07802		120	0.095254		123	0.047561
	80	0.152372		82	0.07802		124	0.030174		127	0.110806

83	0.115553	82	0.07802	114	0.057905	127	0.110806
85	0.040921	80	0.137235	114	0.057905	134	0.022555
79	0.118753	78	0.139138	122	0.062172	124	0.06623
80	0.152372	82	0.07802	118	0.108518	126	0.101092
79	0.118753	80	0.137235	118	0.108518	126	0.101092
78	0.078026	79	0.148035	117	0.103647	126	0.101092
79	0.118753	76	0.081311	118	0.108518	130	0.090407
77	0.043219	76	0.081311	114	0.057905	132	0.05297
85	0.040921	77	0.113948	120	0.095254	126	0.101092
80	0.152372	83	0.047846	116	0.091927	127	0.110806
82	0.150305	80	0.137235	120	0.095254	127	0.110806
82	0.150305	80	0.137235	123	0.044947	126	0.101092
83	0.115553	75	0.050556	123	0.044947	123	0.047561
84	0.074893	75	0.050556	123	0.044947	131	0.072018
85	0.040921	77	0.113948	113	0.041124	129	0.104787
80	0.152372	83	0.047846	114	0.057905	126	0.101092
79	0.118753	75	0.050556	122	0.062172	129	0.104787
79	0.118753	75	0.050556	114	0.057905	126	0.101092
83	0.115553	81	0.110852	123	0.044947	134	0.022555
81	0.164822	79	0.148035	112	0.027121	129	0.104787
77	0.043219	76	0.081311	124	0.030174	132	0.05297
82	0.150305	75	0.050556	117	0.103647	124	0.06623
84	0.074893	77	0.113948	117	0.103647	125	0.085155
81	0.164822	82	0.07802	113	0.041124	129	0.104787
83	0.115553	78	0.139138	121	0.079859	128	0.112141
79	0.118753	82	0.07802	113	0.041124	130	0.090407
79	0.118753	78	0.139138	112	0.027121	130	0.090407
80	0.152372	82	0.07802	122	0.062172	134	0.022555
78	0.078026	80	0.137235	119	0.105506	130	0.090407
77	0.043219	81	0.110852	114	0.057905	123	0.047561
79	0.118753	80	0.137235	114	0.057905	128	0.112141
82	0.150305	77	0.113948	115	0.075712	122	0.031535
85	0.040921	75	0.050556	122	0.062172	126	0.101092
80	0.152372	80	0.137235	120	0.095254	126	0.101092
80	0.152372	76	0.081311	122	0.062172	124	0.06623
80	0.152372	81	0.110852	121	0.079859	130	0.090407
77	0.043219	82	0.07802	112	0.027121	130	0.090407
81	0.164822	82	0.07802	123	0.044947	129	0.104787
81	0.164822	82	0.07802	120	0.095254	131	0.072018
79	0.118753	80	0.137235	123	0.044947	129	0.104787
79	0.118753	83	0.047846	116	0.091927	122	0.031535
85	0.040921	77	0.113948	121	0.079859	129	0.104787
79	0.118753	76	0.081311	118	0.108518	128	0.112141
81	0.164822	78	0.139138	121	0.079859	131	0.072018
80	0.152372	78	0.139138	113	0.041124	124	0.06623
84	0.074893	75	0.050556	123	0.044947	123	0.047561
85	0.040921	76	0.081311	121	0.079859	126	0.101092

84	0.074893	80	0.137235	115	0.075712	125	0.085155
83	0.115553	80	0.137235	116	0.091927	123	0.047561
78	0.078026	82	0.07802	122	0.062172	132	0.05297
80	0.152372	83	0.047846	115	0.075712	124	0.06623
81	0.164822	82	0.07802	116	0.091927	122	0.031535
82	0.150305	77	0.113948	119	0.105506	129	0.104787
79	0.118753	75	0.050556	122	0.062172	126	0.101092
84	0.074893	77	0.113948	120	0.095254	131	0.072018
79	0.118753	76	0.081311	116	0.091927	133	0.035972
81	0.164822	79	0.148035	123	0.044947	131	0.072018
83	0.115553	83	0.047846	122	0.062172	128	0.112141
84	0.074893	75	0.050556	123	0.044947	132	0.05297