

Internship Report

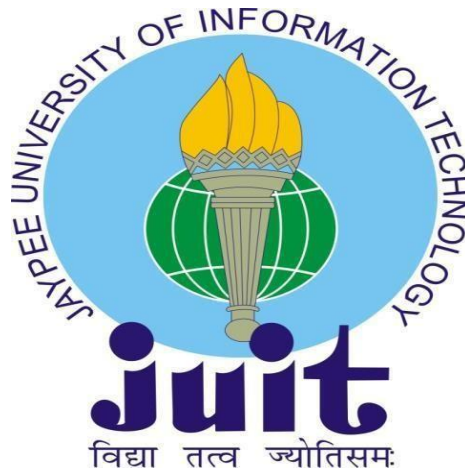
Internship report submitted in partial fulfillment of the requirement for the degree of Bachelor of Technology

In

**Computer Science and Engineering/Information
Technology**

By

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An Internship Report with regard to Cognizant Internship.

Acknowledgements

This is a matter of pleasure for me to acknowledge my deep sense of gratitude to Jaypee University and my college, Jaypee university of information technology for giving me an opportunity to explore my abilities via this internship programme. I would like to express my sincere gratitude to our TnP officer, Mr. Pankaj kumar and our faculty Coordinator, Dr. Nafis U Khan for this opportunity. I also wish to express my gratitude to my internship supervisor, for the invaluable guidance and advice in completing this project.

I would like to record my sincere appreciation and gratitude towards all the officials and employees of cognizant, without whose kind assistance, my internship program would not have succeeded. The facts and other vital information provided by them have contributed towards making this report as comprehensive as possible. I am indeed thankful to them.

Last but not the least, I would like to express my sincere thanks to all my family members, friends and well-wishers for their immense support and best wishes throughout the internship duration and the preparation of this report.

I believe that this report will be a valuable asset not only for academic institution, but will also be useful for all those who are interested to learn about internship experiences in auditing and consulting firm.

Candidate's Declaration

I hereby declare that the work presented in this report entitled “**Internship Report**” in partial fulfillment of the requirements for the award of the degree of **Bachelor of Technology in Computer Science and Engineering/Information Technology** submitted in the department of Computer Science & Engineering and Information Technology, Jaypee University of Information Technology Waknaghat is an authentic record of my own work carried out over a period from Feb 2021 to May 2021 under the supervision of Mr. **Abhijeet Joshi**(Trainer at Cognizant). The matter embodied in the report has not been submitted for the award of any other degree or diploma.



Nishant Bhandari(171346)

This is to certify that the above statement made by the candidate is true to the best of my knowledge.

Mr. Abijeet Joshi

Trainer at cognizant

Dated: 20/05/2021

Dr. Ruchi Verma

Project Supervisor

Dated: 18/06/2021

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Chapter1

Organization Profile

1.1 Background:

After the completion of the 7th semester, different companies have visited our institution to place a student, one such firm is aware of it. I have been chosen for GenC profile because of my good fortune, and after selecting Gen-C, the student has given me an internship programme prior to the full time role and the full time role of the student has to take place. The 12 weeks of internship included several workshops, a webinar, online udemy courses, evaluations and projects..

Cognizant is India's largest IT corporation and the US leader in IT. Cognizant personnel employ over 3 lakh workers and attract around 20,000 new Indians every year. Cognizant also employs people from other countries worldwide.

In the firm, Cognizant provides a number of roles: designer, testing and management, however before becoming an associate, each individual need do the internship and after an internship, for a company member to join the firm, there is one year of probation..

Cognizant also offers scholarships to internships during the internship time, which amounts to roughly 12,000 per month.

The entire amount is just 10800 in people's hands since 1200 are subject to tax reduction.

The internship time varies and relies on the job played by the intern, like someone who has an extension, for 4-5 months, and the quality assurance may vary between 5 and 6 months..

The domain assignment for interns is random, but sometimes depends on the assimilation exam, too. The individual who has the highest grades in the assimilation exam has greater odds of getting a better profile or domain.

.

1.2 Mission, vision, values and objectives

Mission –The cognizing task is to train every new individual who has been picked. Cognizant offers internships to everyone who has been selected.

Every year, teach students fresh up in bulk before handing them the function of associate. This recruitment takes place throughout the Indian university.

Cognizant invests a lot of time, effort and money on the workshop before giving it the task and in the real world..

Vision- The cognizant vision is to train every fresh out student recruited from the college no matter from which college the persons comes.

Values

The values of the organization are as follows:

- *Valuing People*

We think our success mostly depends on individuals. In all our activities, our interactions with our customers, professional colleagues, reference sources, sellers, community members and each other are high-quality and mutually beneficial..

- *Building Client Relationships*

In building a strong sense of business and personal objectives for each customer, exhibiting the firm reliability and integrity in our work and serving as an autonomous and impartial consultant to our clients, we want to gain long-term client loyalty.

- *Upholding Quality and Integrity*

We shall establish a climate in which quality, honesty, respect, fairness and professional ethics guide everybody's actions and choices in our company..

Keys to Success:

- Complete the work with full honesty.
- Complete the work on time.
- Complete the assessment.
- Complete the project within schedule time.
- Try to learn as much as possible from the SME, Trainer, mentor.
- Open to learn anything taught.

1.3. Objectives:

The objectives of Cognizant are:

- The overarching aim is to target its specialised services and to become a leader in the nation's specialisation.
- Growth-To increase the business at a rate that is difficult and controllable, providing innovation and adaptation in the market.

Chapter 2

QEA Basics

2.1. Stage 1 – QEA Basics

I was inducted as a team member in my cohort then, this QEA testing started, this QEA Basics consist of the certain weeks in which we have to learn various technology and do various hands-on and assessment during this SDET internship where we had to study functional testing.

2.2. Week 1:

- Functional Testing .
- Basics of Automation Concepts .
- ICT (Integrated Capability Test) .

This week, we must all finish the udey courses offered by the cognizant throughout the internship, as well as the hands-ons, evaluation (which is critical), and the integrated competency exam.

In the week 1 we learned the QEA basics from scratch which included topics like functional testing and software testing.

After finishing the online udey courses, we conducted the hands-ons, which are required for all interns, and after completing the hands-ons, we used to provide evaluation, which was a brief exam whose marks were taken into consideration, for the calculation of the final overall performance..

The most important part of this week was covering all the basis aspects of the QEA , agile ,black box and white box testing from scratch because learning these topics is very important in designing.

It has also covered some other basics of testing in excel sheets as well as in some other technologies.

2.2.1. Schedule for week 1

Week 1

- Functional Testing
- Basics of Automation Concepts
- ICT (Integrated Capability Test)

Day 1

Functional Testing

Continuous Learning: Technical Enablement

Learn the basics of Agile Fundamentals and Software Testing Life Cycle

Section 2: Basics Concepts of Software Testing

Section 3: Test Case Writing

Section 4: Test Execution & Bug reporting

Section 8: Basics of Agile and Agile Testing

Day 2

Software Testing

Continuous Learning: Technical Enablement

Learn the basics of Software Testing Life Cycle

Section 7: How to Use Test Link

Section 10: Freelance Testing websites

Day 3

Software Testing

Continuous Learning: Technical Enablement

Learn the basics of Software Testing Life Cycle

Section 5: Real Testing Project: How to write test scenarios from Requirement

Day 4

Software Testing

Continuous Learning: Technical Enablement

Learn the basics of Software Testing Life Cycle

Section 6: Black Box Test Techniques

Section 8: Basics of Agile & Agile Testing

Section 11: White Box Test Techniques

Day 5

Software Testing

Assess-Type-2: Integrated Capability Test (ICT)

Functional Testing

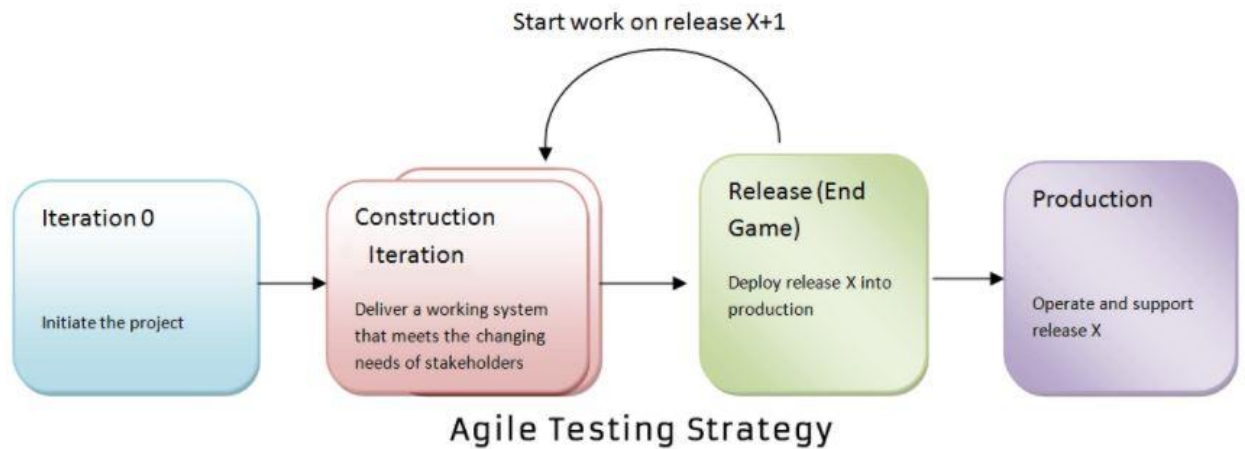
2.2. Concepts Studied.

2.2.1. Agile Testing: is a testing method that adheres to the agile software development norms and concepts. Unlike the Waterfall technique, Agile Testing may begin right at the start of a project, with development and testing working in tandem. The Agile Testing technique is not sequential (in the sense that it is carried out only after the development process is completed), but rather continuous.

- **Agile Test Plan:** It covers test data requirements, infrastructure, test environments, and test results from that iteration's testing. Unlike the waterfall methodology, an agile methodology involves writing and updating a test strategy for each release. In agile, typical test plans contain the following:

1. Testing Scope
2. New functionalities which are being tested
3. Level or Types of testing based on the features complexity
4. Load and Performance Testing
5. Infrastructure Consideration
6. Mitigation or Risks Plan
7. Resourcing
8. Deliverables and Milestones

- **Agile Testing Strategies:** The agile testing life cycle is divided into four segments.

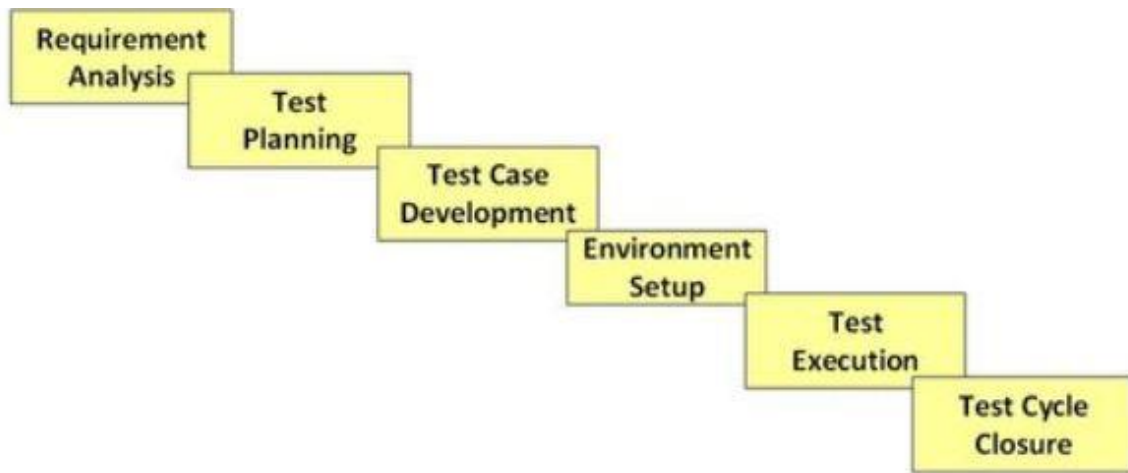


2.2.2. Software Testing Life Cycle: It is a set of activities carried out during the testing process to guarantee that software quality objectives are satisfied. Both verification and validation are part of the STLC process. Software testing is not merely a single/isolated operation, contrary to common notion. It comprises of a set of operations that are carried out in a methodical manner to assist with the certification of your software product. Software Testing Life Cycle (STLC) is an acronym for Software Testing Life Cycle.

- **STLC Phases:** Every Software Testing Life Cycle Model (STLC Model) has the following six key phases:

Requirement Analysis

1. Test Planning
2. Test case development
3. Test Environment setup
4. Test Execution
5. Test Cycle closure



STLC Model Phases

- **Entry and Exit Criteria in STLC:** All phases of the Software Testing Life Cycle contain Entry and Exit Criteria (STLC)
 1. **Entry Criteria:** The required things that must be done before testing can begin are listed in the Entry Criteria.
 2. **Exit Criteria:** The tasks that must be accomplished before testing may be finished are referred to as exit criteria.
- **Test Planning in STLC:** It is the phase in which a Senior Quality Assurance Manager defines the project's test plan approach, as well as the project's effort and cost estimations. Also determined are the resources, test environment, test constraints, and testing timetable. In the same step, the Test Plan is created and completed.

Test Planning Activities:

- 1.Preparation of test plan/strategy document for various types of testing
- 2.Test tool selection
- 3.Test effort estimation
- 4.Resource planning and determining roles and responsibilities.
- 5.Training requirement

2.2.3. Black Box Testing: It is the phase in which a Senior Quality Assurance Manager defines the project's test plan approach, as well as the project's effort and cost estimations. Also determined are the resources, test environment, test constraints, and testing timetable. In the same step, the Test Plan is created and completed.

- **Types of Black Box Testing:** There are several different forms of Black Box Testing, however the following are the most common:

1. Functional testing - This form of black box testing is concerned with a system's functional requirements and is carried out by software testers.
2. Non-functional testing - This sort of black box testing is concerned with non-functional criteria such as performance, scalability, and usability rather than specific functionality.
3. Regression testing is performed after code changes, upgrades, or other system maintenance to ensure that the new code does not harm the current code.

- **Black Box Testing Techniques:** Among the various test strategies used in black box testing, the following are the most popular.

1. Equivalence Class Testing is a technique for reducing the number of possible test cases to the bare minimum while maintaining adequate test coverage.
2. Boundary Value Testing: Boundary value testing is concerned with the values found at the edges of a boundary. This method assesses whether or not a set of values is acceptable to the system. It's a great way to cut down on the amount of test cases. It's best for systems with inputs that fall between specific ranges.
3. Testing using Decision Tables: In a decision table, causes and effects are arranged in a matrix. Each column has a different combination.

2.2.4. White Box Testing: It is a software testing approach that involves examining the product's internal structure, architecture, and code in order to validate input-output flow and enhance design, usability, and security. White box testing is also known as Clear box testing, Open box testing, Transparent box testing, Code-based testing, and Glass box testing since the code is visible to the testers. It's one of two components of the software testing technique known as Box Testing.

- **Types of White Box Testing:** White box testing refers to a variety of testing methods that are used to assess the usability of an application, a piece of code, or a specific software package. The following is a list of types —
 1. **Memory Leaks Must Be Tested:** Memory leaks are one of the most common reasons of apps that operate slowly. When you have a slow-running software programme, you need a QA professional who is skilled in discovering memory leaks.
 2. **Unit Testing:** Unit testing is frequently the first sort of application testing performed. As each unit or block of code is produced, it is subjected to unit testing. The programmer is primarily responsible for unit testing. As a software developer, you write a few lines of code, a single function, or an object, then test it to ensure it works before moving on to the next step. Early in the software development lifecycle, unit testing aids in the detection of the majority of issues. Bugs discovered at this stage are less expensive and easier to solve.
- **White Box Testing Techniques:** Code Coverage Analysis is a popular White box testing approach. A Test Case suite's holes are filled through Code Coverage analysis. It detects parts of a programme that aren't put to the test in a collection of test cases. You write test cases to check untested areas of the code once the holes have been detected, therefore improving the quality of the software product.
 1. **Statement Coverage:** During the software engineering testing process, this methodology mandates that every conceivable statement in the code be tested at least once.
 2. **Branch Coverage -** This methodology examines every conceivable path of a software application (if-else and other conditional loops).

2.2.5. Hands-On

1. Hotel Booking:

UI Screenshot:

The screenshot shows the website **www.raj.travel** with a navigation bar containing links for Home, Flights, Hotels, Holidays, Airport Express, Business Travel, and Raj Rewards™. Below the navigation bar, there are links for Book, Retrieve Booking, Terms & Conditions, Passport Info, Raj Travel Offices, and Tailor Made Holidays.

The main content area is divided into two sections:

- Book your hotel:** This section allows users to search for hotels. It includes radio buttons for "India" (selected) and "International". The form fields are:
 - Country*: India (dropdown)
 - City*: --Select One-- (dropdown)
 - Check In*: 31MAY2012 (calendar icon)
 - Check Out*: 01JUN2012 (calendar icon)
 - Nationality*: Indian (dropdown)
 - Rooms*: 2 (dropdown)
 Below these fields are two room configuration rows:
 - Room 1: Adults* 1 (dropdown), Children 0 (dropdown), (Below 12 years)
 - Room 2: Adults* 1 (dropdown), Children 0 (dropdown), (Below 12 years)
 A red "Search" button is located at the bottom right of this section.
- RAJ REWARDS™:** A login section with fields for "Login ID" and "Password", a "Login" button, and a "Forgot Password" link.

There are also promotional banners:

- BEST HOTEL DEALS:** A blue banner advertising "International Domestic" deals with a "Click Here" button and the RAJ logo.
- Now Book Online with your Internet Banking Account:** A banner featuring logos for ICICI Bank, Citibank, Axis Bank, and SBI, along with a "Know more" button and a red mouse icon.

A "Special Offer" banner at the bottom left states: "Introducing travel insurance from ICICI Lombard for only Rs. 25 with your domestic flight!" with an image of a family.

Figure – UI Screenshot

Table-Test Scenarios

	A	B	C	D	E
1	Module	Scenario ID	Scenario Name	Scenario Description	Requirement id
2	Raj Travels	SID_01	Searching for hotels in India with a valid input.	Verify checking of hotels functionality by providing with valid input details.	1
3		SID_02	Searching for hotels in India with an invalid input.	Verify checking of hotels functionality by providing with invalid input details.	1
4		SID_03	Searchung for hotels in international with valid input	Verify checking of hotels functionality by providing with valid input details.	2
5		SID_04	Searching for hotels in international with an invalid input	Verify checking of hotels functionality by providing with invalid input details.	2

Table-Test cases

A	B	C	D	E	F	G	H	I	J
Test Scenario ID	Test case id	Test case description	Prerequisites	Steps to execute	Expected results	Actual results	Pass/Fail	Defect id	Remarks
TSID_01	TCID_01	Hotel search in India with valid input	Raj Travels website should be opened and India radio button should be selected	1. Select the city name from the drop down list 2. Select Check-In date from Check-In date field 3. Select Check-Out date from Check-Out date field 4. Select number of Rooms from Rooms field 5. Select number of Adults from Adults field 6. Select number of Child from Childs field 7. Click on Search button	The selected city should be displayed The selected Check-In date should be displayed The selected Check-Out date should be displayed The number of rooms selected should be displayed The number of adults selected should be displayed The number of Child selected should be displayed The Results matching to the entered criteria should be displayed		NO RUN	DEF_03	
TSID_02	TCID_02	Hotel search in India with invalid input	Raj Travels website should be opened and India radio button should be selected	1. Select the Invalid city name from the drop down list 2. Select Check-In date from Check-In date field 3. Select Check-Out date from Check-Out date field 4. Select number of Rooms from Rooms field 5. Select number of Adults from Adults field 6. Select number of Child from Childs field 7. Click on Search button	The selected city name is invalid, so error message should be displayed The selected Check-In date should be displayed The selected Check-Out date should be displayed The number of rooms selected should be displayed The number of adults selected should be displayed The number of Child selected should be displayed The Results matching to the entered criteria should be displayed		NO RUN		
	TCID_03	Hotel search in India with invalid input	Raj Travels website should be opened and India radio button should be selected	1. Select the city name from the drop down list 2. Select Invalid Check-In date from Check-In date field 3. Select Check-Out date from Check-Out date field 4. Select number of Rooms from Rooms field 5. Select number of Adults from Adults field 6. Select number of Child from Childs field 7. Click on Search button	The selected Check-In date is invalid, so error message should be displayed The selected Check-Out date should be displayed The number of rooms selected should be displayed The number of adults selected should be displayed The number of Child selected should be displayed The Results matching to the entered criteria should be displayed		NO RUN	DEF_02	
	TCID_04	Hotel search in India with invalid input	Raj Travels website should be opened and India radio button should be selected	1. Select the city name from the drop down list 2. Select Check-In date from Check-In date field 3. Select Invalid Check-Out date from Check-Out date field 4. Select number of Rooms from Rooms field 5. Select number of Adults from Adults field 6. Select number of Child from Childs field 7. Click on Search button	The selected city should be displayed The selected Check-In date should be displayed The selected Check-Out date is invalid, so error message should be displayed The number of rooms selected should be displayed The number of adults selected should be displayed The number of Child selected should be displayed The Results matching to the entered criteria should be displayed		NO RUN		
	TCID_05	Hotel search in India with invalid input	Raj Travels website should be opened and India radio button should be selected	1. Select the city name from the drop down list 2. Select Check-In date from Check-In date field 3. Select Check-Out date from Check-Out date field 4. Select Incorrect number of Rooms from Rooms field 5. Select number of Adults from Adults field 6. Select number of Child from Childs field 7. Click on Search button	The selected city should be displayed The selected Check-In date should be displayed The selected Check-Out date should be displayed The number of rooms selected is invalid so error message should be displayed The number of adults selected should be displayed The number of Child selected should be displayed The Results matching to the entered criteria should be displayed		NO RUN		
	TCID_06	Hotel search in India with invalid input	Raj Travels website should be opened and India radio button should be selected	1. Select the city name from the drop down list 2. Select Check-In date from Check-In date field 3. Select Check-Out date from Check-Out date field 4. Select number of Rooms from Rooms field 5. Select Incorrect number of Adults from Adults field 6. Select number of Child from Childs field 7. Click on Search button	The selected city should be displayed The selected Check-In date should be displayed The selected Check-Out date should be displayed The number of rooms selected should be displayed The number of adults selected is invalid so error message should be displayed The number of Child selected should be displayed The Results matching to the entered criteria should be displayed		NO RUN		
	TCID_07	Hotel search in India with invalid input	Raj Travels website should be opened and India radio button should be selected	1. Select the city name from the drop down list	The selected city should be displayed				

Table-Defect Report

A	B	C	D	E	F	G	H	I	J
Serial no.	Defect id	Description	Reproducible (yes/no)	Steps to reproduce	Severity	Priority	Reported by	Reported date	Status
1	1 DEF_01	When one clicks on "International" radio button, the list box "Country" is not shown.	Yes	Precondition: Raj Travels website should be launch and India radio button should have been selected	Medium	Medium	Nishant	20-Feb-21	New
2		Expected Result: list box of countries should be displayed		Steps to Reproduce:					
3		Actual Result: list box of countries is not displayed		1. Launch the "www.raj.travel" website					
4		Impacted Test case: TCID_08		2. Click on international radio button					
5	2 DEF_02	After entering the Check-out date smaller than Check-In date and clicking "Search" after selecting all other valid details, the website displays all the results.	Yes	Precondition: Raj Travels website should be launch and India radio button should have been selected	Medium	Medium	Nishant	20-Feb-21	New
6		Expected Result: An error message "Invalid Check-In and Check-Out dates" and no other result displayed.		Steps to Reproduce:					
7		Actual Result: All records are displayed despite of the invalid date entries.		1. Launch the "www.raj.travel" website					
8				2. Choose the desired radio button as "India" or "International".					
9				3. Select a valid Check-In date which is greater than the Check-Out date					
10				4. Click on the "Search" button					
11	3 DEF_03	After selecting city "Shimla" and clicking "Search" after entering all the mandatory fields, the hotel details of "Manali" are displayed.	Yes	Precondition: Raj Travels website should be launch and India radio button should have been selected	Medium	Medium	Nishant	20-Feb-21	New
12		Expected Result: The details of hotels in "Shimla" should be displayed		Steps to Reproduce:					
13		Actual Result: The hotel details of city "Manali" are being displayed.		1. Launch the "www.raj.travel" website					
14				2. Click on India radio button					
15				3. Choose the city as "Shimla" from the					
16				4. Enter the remaining required mandatory fields					
17				5. click on the "Search" button					

Table-RTM

	A	B	C	D	E	F
1	Serial no	Requirement id	Requirment description	Test scenario id	Test case id	Defect id
2	1	RID_01	Search functionality with the India radio button	TSID_01	TCID_01	DEF_03
3				TSID_02	TCID_02	
4					TCID_03	DEF_02
5					TCID_04	
6					TCID_05	
7					TCID_06	
8					TCID_07	
9	2	RID_02	Search functionality with the International radio button	TSID_03	TCID_08	DEF_01
10				TSID_04	TCID_09	
11					TCID_10	DEF_02
12					TCID_11	
13					TCID_12	
14					TCID_13	
15					TCID_14	
16						

2. Student Enquiry Form:

The screenshot shows a web-based 'Students Enquiry Form' for 'ARENA COURSES'. The form is titled 'Please fill up the form below (* fields are mandatory)'. It contains the following fields:

- Name *
- Gender * Male Female
- Date of Birth * Date Month Year
- Email ID
- Phone *
- City
- Pincode
- Interested in
- Comments

At the bottom of the form are two buttons: 'SUBMIT' and 'CANCEL'. On the left side of the page, there is a navigation menu with the following items:

- Overview
- AAASP
- AAIP
- BSc
- DAE Film Making
- Short term
- Students Enquiry (highlighted)

Below the navigation menu, there are logos for 'Autodesk Authorized Training Center', 'AUTHORISED Adobe Training Centre', and 'INDIA AMONG ARENA CENTRES'.

Figure-UIScreenshot

Table-Defect Report

1	A	B	C	D	E	F	G	H	I	J	K
1	Serial no.	Defect id	Description	Reproducible (yes/no)	Steps to reproduce	Severity	Priority	Reported by	Reported date	Status	Remarks
2	1	DEF_01	When the "Submit" button is clicked without entering any value in "Phone" field, no error message is displayed.	Yes	Precondition: Arena application should be launched and Student Enquiry Form should be displayed	High	High	Nishant	19-02-2021	New	
3			Expected Result: An error message should be displayed		Steps to reproduce:						
4			Actual Result: No error message is displayed		1. Open the Arena Application						
5			Impacted Test case: TCID_21		2. Click on "Submit" button without entering any value in phone field						
6	2	DEF_02	User clicks on the "Interested in" box and it is blank with no value	Yes	Precondition: Arena application should be launched and Student Enquiry Form should be displayed	High	High	Nishant	19-02-2021	New	
7			Expected Result: An error message should be displayed		Steps to reproduce:						
8			Actual Result: No error message is displayed		1. Open the Arena Application						
9			Impacted Test case: TCID_08		2. Click on the "Interested In" listbox						
10	3	DEF_03	User fills in all details and clicks on "Cancel" button but the system does not erase the data	Yes	Precondition: Arena application should be launched and Student Enquiry Form should be displayed	High	High	Nishant	19-02-2021	New	
11			Expected Result: The system should erase the data after "Cancel" button is clicked		Steps to reproduce:						
12			Actual Result: The system did not erase the data after the "Cancel" button is clicked		1. Open the Arena Application						
13			Impacted Test case: TCID_22		2. Click on the "Cancel" button after filling up all the data						
14											
15											

Table-RTM

1	A	B	C	D	E	F
1	Serial no	Requirement id	Requirement description	Test scenario id	Test case id	Defect id
2	1	RID_01	Searching for a course on Animation	TSID_01	TCID_01	
3					TCID_02	
4					TCID_03	
5					TCID_04	
6					TCID_05	
7					TCID_06	
8					TCID_07	
9					TCID_08	DEF_02
10					TCID_09	
11				TSID_02	TCID_10	
12					TCID_11	
13					TCID_12	
14					TCID_13	
15					TCID_14	
16					TCID_15	
17					TCID_16	
18				TSID_03	TCID_17	
19					TCID_18	
20					TCID_19	
21					TCID_20	
22				TSID_04	TCID_21	DEF_01
23					TCID_22	DEF_03
24						
25						

Chapter 3

Java Programming Fundamentals

3.1. Week 2- Java Overview

Java is a general purpose, class-oriented, autonomous design, object-oriented programming. It can allow Java developers to write once and execute on every Java computer to remove the requirement for functionality sacrifice. Java programmes are typically compiled as bytecode and execute on each Java JVM platform. The grammar between C and C++ is equal, however services are less low. Sun supplied the compilers, and also the APIs, under non-open source licences. Sun does so. Oracle will offer no more improvements in costs for legacy Java 8 for business use, but will also continue to provide public upgrades for Java 8 for personal use..

These five were important to Java's development: usability, safety, portable, expressive, effective, scalable and expansive, performance, adaptability and confidence..

1. It has to be easy to use, focused on the user, and succinct.
2. To be of good quality, it must be hardy and tough.
3. It has to be impartial with regards to construction and compact.
4. High-quality execution is important.
5. Fluency, continuity, and versatility

At Sun, four unique Java API versions have been provided, which may be used in different platform-specific applications.

Different apps based on Java:

1. GUI apps may be developed using Java. These applications are built on AWT, Swing, JavaFX.
2. In order for most software programmes to run on practically all smartphones, mobile devices have been designed with Android the prevalent Mobile OS that now has to be used by Java. In addition, the Android Studio and Kotlin support Java..
3. Empirical applications are huge software systems that have not been designed for human or personal objectives by the corporation for use in an organisational environment. In addition to Java's specification-compliant capabilities, it is also a popular solution for enterprises. Enterprise examples include enterprises, institutions of education, financial networks, ERP (ERP) systems, databases for associations, foundations, and government projects..
4. Science would obviously effect a real-life implementation of mathematics. Since

Java's outstanding capabilities enable scientific software, this is a good scientific development platform. For the development of the front end (an combined BUI and backend implementation) MATLAB is the perfect solution for science computing) (a core part of the system).

5. Interactive websites A software application is a software that is used on the internet as a web client or server, and as such may be delivered by a device.

6. Embedded Sys: An embedded device, known alternatively as an integrated solution, integrates multiple small processing units with larger systems to perform specialised functions. Java is a significantly poor efficiency for tiny embedded/embedded systems, requiring less Java runtime memory.

7. Big data technologies: "extreme data" implies "very large, dynamic databases which are processed to capture important knowledge, patterns and trends. Large data technologies: Current technology, widespread worldwide, is the subject of networking. Moreover, automated waste management and sound memory upkeep emphasise this more than other computer languages

3.1.1.JVM

At runtime, the JVM serves as a Java programme host. A JVM runs the code that invokes the key function that is included in a Java source file. Feature is needed for a successful installation of Java Runtime Environment. disposable from the wealth of acronyms A .class file (which is a filename containing bytecode) is created whenever we compilation the .java document. This class file progresses through many distinct stages as it is executed. It gives you the entire picture of the Virtual machine

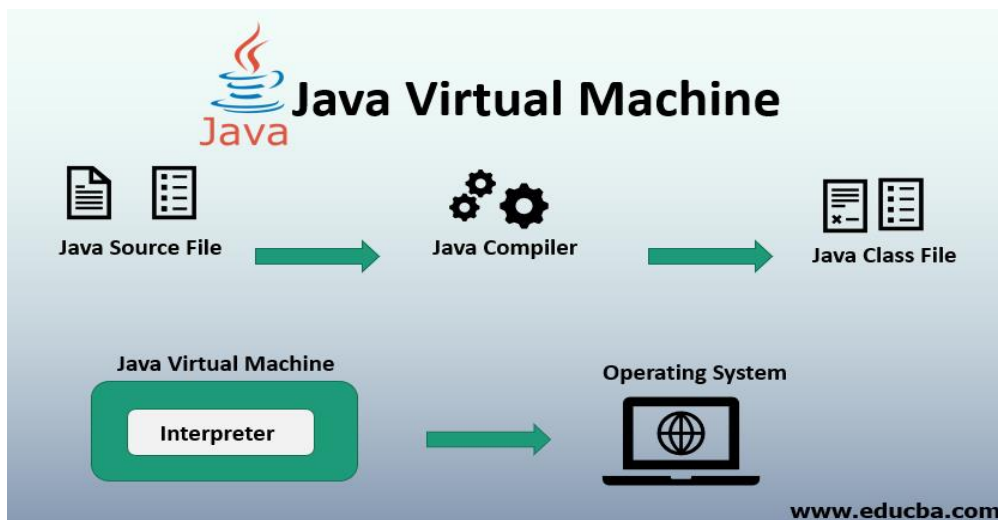


Figure 3.1 JVM

The Class Loader subsystem mainly participates in three areas: loading classes, registration processing and waste collection management..

1. The loader loads and saves information to the ".class" function. 1. For every

".class" file, the system saves the following: The qualifying title of a class, with its name and class label follows. And if the file ".class" is for Class or Enum, it is inconsistent. Advanced, feature, name, parameters, etc.

2. 2. Linking comprises of linking, planning, verifying and resolving it (optionally). By checking class files thoroughly, the consistency of the.class file ensures that it has been generated with or not with an appropriate compiler. The authentication fails to be an operational exception. The Bytecode Validator component performs this operation..
3. Finalization: The code specifies static variables and their values are allocated in the first phase of implementation. This is done from the top downward, from the class to the class hierarchy..

Java memory is made up of these:

All class-level information including names, parent class names, instance variables, etc. is stored in the process field.

Everything's about the heap. Finally, the Java Virtual Machine is a heap area. This can also be regarded as a common property.

Field of exchange The JVM constructs and saves a new runtime stack to assign a new memory. Each block has a "activation record" in this stack. It has a regular classloader since it runs a ".class" (bytecode). The Python programming language reads byte code line by line, by field and byte and assembly code execution. There are three fundamental component categories: The strategic instrument is basic, complicated and compositional.

It is often used to develop web-based Java applications and applets. The language jython includes an execution time, an interpreter/loader, a compiler, etc.

'Environmental Java Runtime' may be shortened as 'JRE.' For running a Java programme, a free, open-source Java software platform such as the Java Runtime Environment (JRE) provides Java Virtual Machine (JVM), core classes and data.

3.1.2.Java Identifiers

Identifiers are used for recognition in computer languages. Any name that may be used as a symbol, such as variable, method, function Object() { [native code] } and class name, can be called a class name.

3.1.3.Data Types

Languages like Java require pre-defines any data form (integer, nature, decimal, etc.) yet stringent typing is statically enforced as the real parts in the language specification must be referred to by each constant or vector.

Two sorts of data are available from Javascript: uninterpreted and programmed. There are primitive data elements, such as binary, character, integer etc. and non-primitive data types. Simplistic data is merely one attribute data and has no distinct features. The main categories of data in Java consist of eight primary sorts of information.

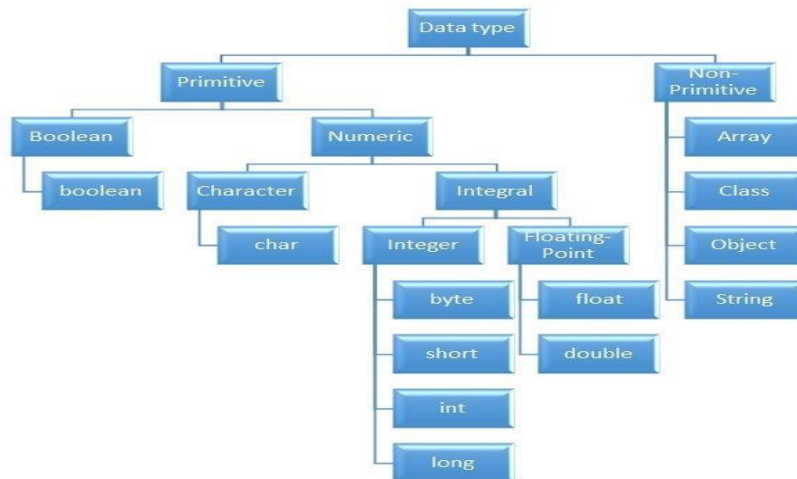


Fig 3.2 Data Types

Non-Primitive Data Type or Reference Data Types-The Reference Data Types will contain a memory address of variable value because the reference types won't store the variable value directly in memory. They are strings, objects, arrays, etc.

3.1.4. Variables

An term refers to a place in the memory frequently referred to as a vector. The basic ingredient of a curriculum. The value of a variable can be changed during programme execution.

The variable is a single designation: everything happening in the memory, all that is done with the variable changes the location of the memory. Before they are included, Java mandates that all variables be made known.

The context in which they are utilised can distinguish between variables of instances and static variables: instance variables are utilised in a process or any other instance, whereas static variables are not.

3.1.5. Loops

Looping in programming languages is a feature which facilitates the execution of a set of instructions/functions repeatedly while some condition evaluates to true.

During loops: a while loop is a flow control state which enables the repeated execution

of code on the basis of a certain Boolean condition. The while loop might be seen as a statement if repeated.

For Loop: for Loop, the structure of the loop is a compact method. On contrast to a certain loop, a statement requires setup, condition and increase/decrease in one line to provide a shorter, more debug-friendly loop structure.

Do while: do while while while is similar to while with just the difference after the statements are executed.

3.1.6.Decision Making

Decision-making is comparable to real-life decision-making. In programming too, we confront some circumstances in which we wish to run a given piece of code when specific conditions are met. This is used to progress the running flow and branch based on programme state changes.

If-else: if-else: The declaration if alone tells us that if there is a condition, a block of statements will be executed and if the condition is wrong, that will not be. But if there is a wrong circumstance, what if we wish to do something else. The other statement comes here. If the statement is incorrect, we can utilise the other statement to run a block of code.

Nested-if: a nest if a declaration is an if it is another if or else target. Nested if declaration means an if declaration in an if declaration.

Case of switch The switch declaration is a multi-way branch declaration. This offers a simple technique of sending the execution to various areas of code based on the expression value.

The RETURN declaration is used to return from a method explicitly. That means that a control of the programme is returned to the method's caller.

3.1.7.Classes and Objects

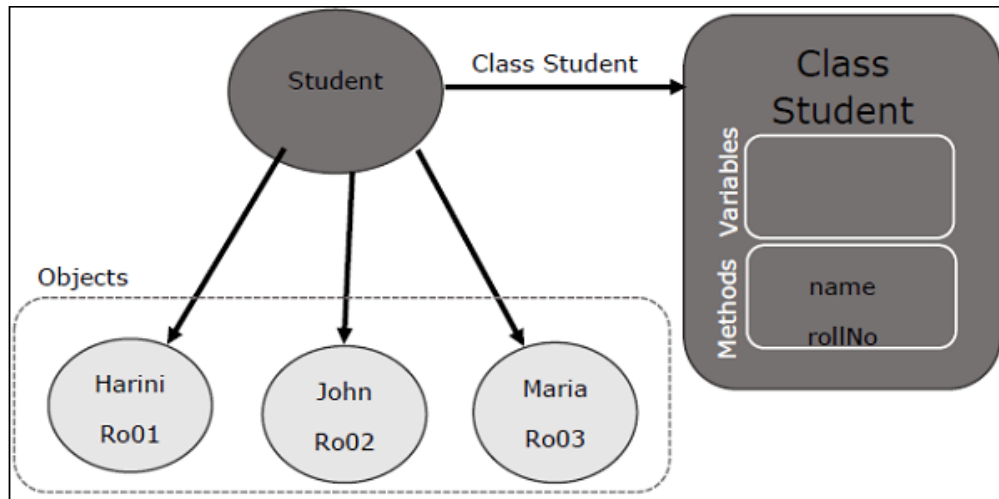
The essential ideas of object-oriented programming that circle round the real-life things are classes and objects.

Class-A is a blueprint or prototype defined by the user that creates objects. It is a collection of characteristics or procedures common to all objects of a same kind. These components may generally be included in class declarations in order::

1. Modifiers: A class can be open or accessed by default (Refer this for details).
2. Keyword class: Keyword class is used for class creation.
3. Name of the class: the first letter of the name should start (capitalized by convention).
4. (if any) superclass: The name (if any), preceded by the term keyword, of the

parent class (super-class). Only one parent is permitted to extend a class.

5. Interfaces, if any: Interfaces: A comma-separated list of interfaces, if any, preceded by the implementations of the keyword. More than one interface can be used by a class.



Body: the body of class with braces enclosed, { }.

For the initialization of new objects, builders are utilised. Fields are variables which give the state and objects of the class and methodology for implementing the behaviour of the class and its objects.

In real-time applications like nested classes, anonymous classes and lambda expressions there are several classes.

Object-It represents the real-life entities and is a basic unit for Object-Concentred Programming. A normal Java application produces several objects that interact with methods, as you know. An item is made from of State is shown through an object's characteristics.

Things in the actual world are the same as objects. For instance, a programme may have objects like "circle," "square," "menu." On the internet shopping system, items like "shopping cart," "client" and "product" may be found..

3.1.8.Access Modifiers

Access modifiers in Java helps to restrict the scope of a class, constructor, variable, method, or data member. There are four types of access modifiers available in java-Default, Private, Protected and Public.

3.1.9.Packages

The package for a set of classes, subpackages, and interfaces in Java is a mechanism. Conflict prevention packages are utilised. Ease classes, interfaces, listings and annotations searching/locating and using. Packages can be seen as encapsulation of data

(or data-hiding). The packages are composed of a wide range of Java API classes.

Certain built-in packages are often utilised:

1. `java.lang`: includes support language classes (e.g., `Class` which defines primitive data types, math operations). The package is imported automatically.
2. `java.io`: includes input/output support classes.
3. `Java.util`: include utilities that implement data structures such as `LinkedList`, `Dictionary` and `Support`.
4. `Java.applet`: includes `Applet` Classes.
5. `java.awt`: Contain classes for the graphical user interface implementation components (like `button`, `menus` etc).
6. `Java.net`: Contain network support classes 6..

3.1.10. Inheritance

It is the technique that in java allows one class to inherit other class's characteristics (fields and methods)..

Syntax:

```
class derived-class extends base-class
{
    //methods and fields
}
```

Heritage Types in Java:

Single heritage: Subclasses inherit the characteristics of a superclass in a single heritage. Class A is the foundation for class B in the illustration below.

Multilevel Heritage: a derivative class inherits a basic class, and the derivative class also functions as a basic class to another class in Multilevel Inheritance.

Hierarchical legacy: In Hierarchical legacy, one class for more than one subclass acts as a superclass (base class).

Multiple heritage: One class may contain more than one superclass and inherited characteristics from all parent classes in multiple heritages.

Hybrid Inheritance (Through Interfaces): It is a mix of two or more of the above types of inheritance.

3.1.11. Constructors

The builders are used to initialise the state of the object. Like methods, a builder also stores statements (i.e. commands) collected during the development of objects.

At least one builder (there may be a default builder) is called upon for assigning initial

values to data members of the same class every time an object with a new () keyword is formed. When the object or instance is created, a builder is invoked.

Two types of builders exist:

1. no argument constructor- The default constructor is known as a function Object() { [native code] } function Object() { [native code] } without a parameter.
2. Parameterized Constructor- A constructor with parameters known as parameterized builder;.

3.1.12.Interfaces

An interface may include methods and variables, like a class, but the methods an interface declares are abstract, by default (only method signature, no body). Interfaces indicate the class and not how. interfaces It's the class's design. An interface concerns such functions. It is also utilised for loose connection. Abstraction interfaces are utilised.

So why utilise interfaces when we have abstract classes? There's a question. Dissimulate internal functionality and display just the users the functionality. i.e. the phenomena of abstract classes are what works (shows), how it works (hiding)..

Interfaces vs. Abstract Classes

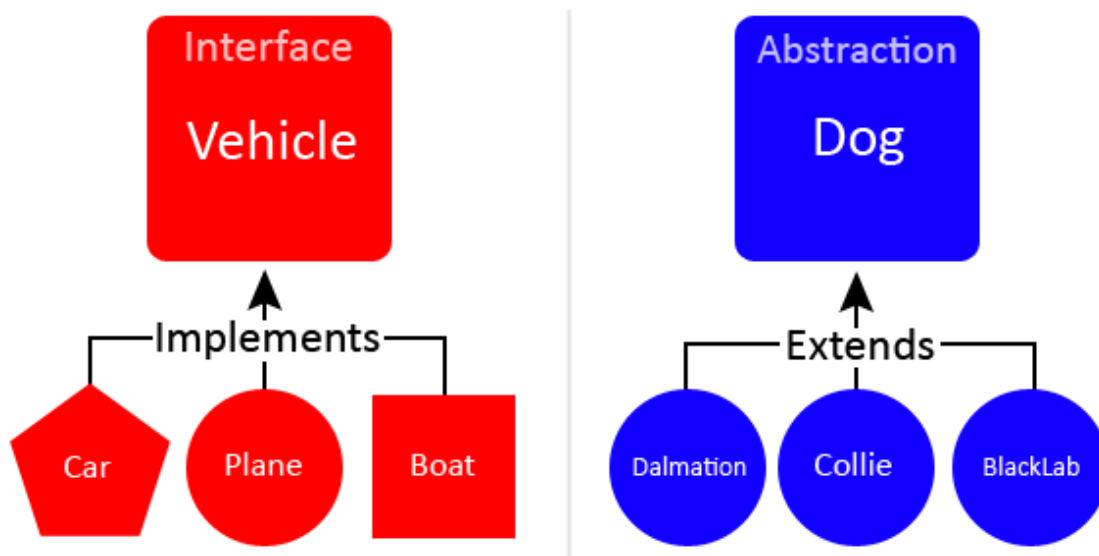


Figure 3.3:Interfaces vs Abstract Classes

3.1.13. Abstraction

data data Abstraction is the quality through which the user is shown only the basic details. The user is not shown the trivial or non-essential units. Ex: Instead of its single components, a car is considered a car.

Abstract classes and methods Abstract An abstract class is an abstract keyword-declared class. A method that is defined without implementation is an abstract method.

3.1.14. Encapsulation

Blend is defined as a single unit wrapping of the data. It is the system which links code and manipulates information.

Encapsulation advantages:

1. Data Hiding
2. Increased Flexibility
3. Reusability
4. Testing Code is easy.

3.1.15. Runtime Polymorphism

The way Java enables Runtime Polymorphism is overridden by the method. When a super class reference for an overridden method is used, Java determines which version(superclass/subclass) of that method is to be run on the basis of the object's type at the time the call takes place. At the execution time, it relies on the type of object (not the reference variable type) to which an overridden method is performed.

Overloading permits the identification of various methods, but distinct signatures, where the signature may change depending on the number of input or kind of input parameter or both.

Overriding is a feature in any object-oriented programming language, which enables a subclass or child class to give a particular application of a method present in its superclasses or parent classes.

3.2 Week-3

3.2.1.Collections

Any set of things represented in one unit are known as the object collection. In Java a distinct "Collection Framework," which contains all the classes and the interface, was set forth in JDK 1.2. A collection of classes and interfaces is a framework that provides ready-made architecture.

Collection Framework Advantages:

1. Consistent API
2. Reduces programming effort
3. Increases program speed and quality
4. Collection Interface-This interface extends the iterable interface and is applied in

the collection framework by all classes. This interface includes all fundamental methods for each collection, such as the collection of data, data removal, data cleaning, etc..

3.2.2. Iterators

In Java collection framework, Iterators are used to obtain individual items. Three iterators are available.

Enumeration-This is an interface used to obtain items in heritage (Vector, Hash table). Listing is the first iterator from JDK 1.0, resting with additional functions are added in JDK 1.2.,

Iterator-It is a universal iterator since it may be used for every object of the collection. We can read and delete operations using Iterator. Enumeration version with extra removability feature of an element is enhanced. For list collection classes like as the array list, linkedlist etc., ListIterator is only relevant. This class skeleton implements the List interface such that efforts to implement the interface are minimised, supported by a Random Access datacenter (such as an array). AbstractSequentialList should be used as a preference for sequential access data (such as a linked list).

3.2.3. ArrayList

ArrayList is part of the collection frame and is available in the package java.util. It gives us dynamic Java arrays. It may nonetheless be slower than default arrays, but it can aid in programmes that require a lot of manipulation. This class may be found in the package java.util.

3.2.4. HashMap

HashMap<K,V> has been included in Java's since Java 1.2 collection. This class is available in the package java.util. It offers the fundamental Java Map interface implementation. It saves the data as (key, value) pairs and may be accessed by a different type index (e.g., an Integer). One object is used for another item as a key (index) (value). If the duplicate key is inserted, the item of the relevant key will be replaced. HashMap is the same as Hash Table, however it is unsync.

3.2.5. Sets

The set interface present in the java. util package and extends the Collection interface is an unordered collection of objects in which duplicate values cannot be stored. It is an interface which implements the mathematical set.

Classes which implement the Set interface in Java Collections

HashSet: Hashset class which is implemented in the collection framework is an inherent implementation of the hash table data structure.

Enum Set: Enum Set class which is implemented in the collection's framework is one of the specialized implementations of the Set interface for use with the enumeration type.

3.2.6.Exception Handling

An exception is an undesirable or unexpected occurrence, which happens while running a programme, i.e. that interrupts the usual flow of the instructions of the programme and an error signals a major problem not to be captured by a sensible application.

Runtime issues like ClassNotFoundException, IOException or SQLException, RemoteException, etc are handled through exception handling. Exception Handling.

The key advantage of exception handling is to keep the programme running normally. The usual flow of your programme is generally interrupted by an exception, which is why.

3.2.7. File Handling

Java.io package includes almost every type of input and output (I&O) you ever need to accomplish in Java. All of these streams are a source and a destination for output. The Java.io package stream provides a number of data such primitives, object, located characters, etc.

Byte streams-Java byte streams are used to generate 8-bit bytes of input and output. Though there are numerous classes in byte streams, FileInputStream and FileOutputStream are the most often used ones.

3.3 Week-4

3.3.1. JDBC

JDBC is the Java Connectivity Database. JDBC is a Java API for connecting and running the database query. It's a JavaSE component (Java Standard Edition). To connect to the database, JDBC API utilises JDBC drivers.

We may access the tabular data in all related databases using the JDBC API. We are able to store, update and remove data from the database by using the JDBC API. It's like Microsoft's Open Database Connectivity.

JDBC applications

Both in the client and in the database, JDBC can be utilised. Java classes with JDBC are

a stronger alternative to SQL-stored methods to incorporate programming logic in the database.

JDBC provides a Java SQL interface: you use JDBC calls to retrieve Java related data.

JDBC is essentially a standard that offers a comprehensive set of interfaces for portable access to a basic database. Java may be used for writing various executable kinds, for example –

1. Java Applications
2. Java Applets
3. Java Servlets
4. Java Server Pages (JSPs)
5. Enterprise JavaBeans (EJBs).

Architecture of JDBC

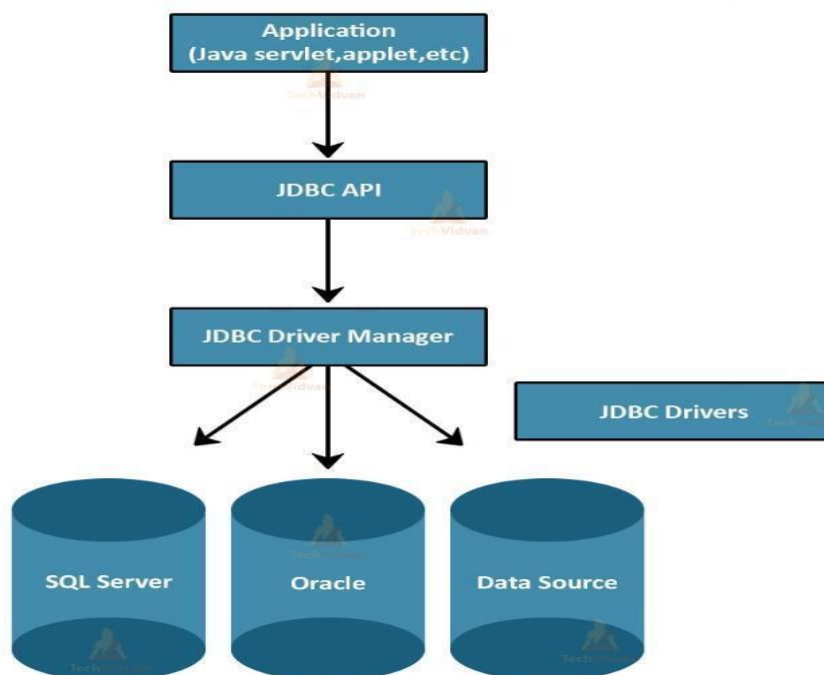


Figure 3.4:Architecture of JDBC

Chapter 4

Web UI AND DATASOURCE

Stage 3 :

This stage includes Web UI and Datasources. It includes XML, JSON, Javascript, Bootstrap and then database management which included SQL and SQL servers. Then we had an ICT.

4.1. Week 2

This week we must do all to take udemy courses, complete the training courses, evaluation (essential) and complete the integrated competence exam, which were supplied by the student during the internship. After we completed the online udemy courses, we did the skill courses and the completion of the hands-ons is obligatory for all stagiaires and a little test whose marks were taken into account after we had completed the hands-ons we used for an evaluation is then necessary to compute the final overall performance.

This week's most significant portion was to cover all the essential parts of html, xml and json, because mastering html is highly vital in design.

4.1.1. HTML

The HyperText markup language or HTML for texts which may be displayed in the web browser is the standard marking language. Technologies such as Cascading Style Sheets (CSS) and scripting languages like JavaScript can be supported. HTML documents from the web server or local storage are received from Web browsers and are transformed into multimedia web pages. HTML specifies the web page structure logically and includes first indications for the content display.

Blocks of HTML pages are the HTML components. The produced page can be integrated with HTML constructions, graphics and other items like interactive forms. HTML offers a way through indicating structural semantics for text, such as Headings, Paragraphs, lists, links, citations and other elements. Tags, write using angle brackets are defined for HTML elements. Tags like `` and `<input/>` enter material directly into a page. Sub-elements may include additional tags like as `<p>`, which surround and give document text information. The HTML tags are not shown in browsers but are interpreted by their users in the content of the page.

HTML stands for Hyper Text Markup Language

- HTML is the standard markup language for creating Web pages
- HTML describes the structure of a Web page
- HTML consists of a series of elements
- HTML elements tell the browser how to display the content



Fig 4.1:HTML Page Structure

Table 4.1: Basic tags in HTML

Tag	Description
<u><!DOCTYPE></u>	Defines the document type
<u><html></u>	Defines an HTML document
<u><head></u>	Contains metadata/information for the document
<u><title></u>	Defines a title for the document
<u><body></u>	Defines the document's body
<u><h1> to <h6></u>	Defines HTML headings
<u><p></u>	Defines a paragraph
<u>
</u>	Inserts a single line break
<u><hr></u>	Defines a thematic change in the content
<u><!--...--></u>	Defines a comment

Table 4.2: Input & Form Tags

Tag	Description
<code><form></code>	Defines an HTML form for user input
<code><input></code>	Defines an input control
<code><textarea></code>	Defines a multiline input control (text area)
<code><button></code>	Defines a clickable button
<code><select></code>	Defines a drop-down list
<code><optgroup></code>	Defines a group of related options in a drop-down list
<code><option></code>	Defines an option in a drop-down list
<code><label></code>	Defines a label for an <code><input></code> element
<code><fieldset></code>	Groups related elements in a form
<code><legend></code>	Defines a caption for a <code><fieldset></code> element
<code><datalist></code>	Specifies a list of pre-defined options for input controls
<code><output></code>	Defines the result of a calculation

Table 4.3: Table Tags

Tag	Description
<code><table></code>	Defines a table
<code><caption></code>	Defines a table caption
<code><th></code>	Defines a header cell in a table
<code><tr></code>	Defines a row in a table
<code><td></code>	Defines a cell in a table
<code><thead></code>	Groups the header content in a table
<code><tbody></code>	Groups the body content in a table
<code><tfoot></code>	Groups the footer content in a table
<code><col></code>	Specifies column properties for each column within a <code><colgroup></code> element
<code><colgroup></code>	Specifies a group of one or more columns in a table for formatting

```

<!doctype html>
<html lang="en">
<head>
  <meta charset="utf-8">
  <title>TravelClient</title>
  <base href="/">
  <meta name="viewport" content="width=device-width, initial-scale=1">
  <link rel="icon" type="image/x-icon" href="favicon.ico">
  <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.0.0-beta3/dist/css/bootstrap.min.css" rel="stylesheet" integrity="sha384-e
</head>
<body>
  <app-root></app-root>
</body>
</html>

```

Fig 1.3: Example of HTML code

4.1.2.XML

XML is an HTML-like benchmark language, but without the need for specified tags. Instead, you set your own tags especially intended to meet your needs. This is a powerful tool to store, search and share data in a format. More crucially, because the basic XML format is defined, the recipient may still digest the information owing to the defined XML syntax if they exchange or transmit XML via systems or platforms, locally or through the Internet.

XML - declaration is also not a tag. It is used for transmission of the meta-data of a document.

```
<?xml version="1.0" encoding="UTF-8"?>
```

Fig 4.4:Attributes:version:Used version XML in this document., encoding :Used encoding in this document.

A small business has one department. That department has one employee. The employee details is given in the table below.

Parent Element is "Department"

Employee

empid	name	salary	email	phoneno
1001	Tom	20000	tom@gmail.com	9874563210

```

<Department>
  <Employee>
    <empid>1001</empid>
    <name>Tom</name>
    <salary>20000</salary>
    <email>tom@gmail.com</email>
    <phoneno>9874563210</phoneno>
  </Employee>
</Department>

```

Fig4.5: Basic XML Document

Table 4.4: Entities

Entity	Character	Description
<	<	Less than sign
>	>	Greater than sign
&	&	Ampersand
"	"	One double-quotation mark
'	'	One apostrophe (or single-quotation mark)

4.1. JSON

JavaScript Object Notation (JSON) is a standard text-based format used to express JavaScript object structured data. It is often used for web-based data transmission (e.g., sending some data from the server to the client, so it can be displayed on a web page, or vice versa). In this post we provide you everything you need to do with JSON using JavaScript, including JSON parsing to enable you to access the data in it and to create JSON. You will find that fairly often.

As explained previously, JSON is a string whose format is quite similar to the literal format of JavaScript object. In a typical JavaScript object you may also include the same fundamental data types within JSON — characters, integers, arrays, booleans and other literal objects.

- The data can only be text when the data is sent between a browser and a server.
- JSON is text, and any JavaScript object we can convert to JSON and transmit JSON to the server.
- Any JSON received from the server may also be converted to JavaScript objects.
- This enables us to use data as objects for JavaScript, without complex parsing and translation.

```
{
  "squadName": "Super hero squad",
  "homeTown": "Metro City",
  "formed": 2016,
  "secretBase": "Super tower",
  "active": true,
  "members": [
    {
      "name": "Molecule Man",
      "age": 29,
      "secretIdentity": "Dan Jukes",
      "powers": [
        "Radiation resistance",
        "Turning tiny",
        "Radiation blast"
      ]
    },
    {
      "name": "Madame Uppercut",
      "age": 39,
      "secretIdentity": "Jane Wilson",
      "powers": [
        "Million tonne punch",
        "Damage resistance",
        "Superhuman reflexes"
      ]
    },
    {
      "name": "Eternal Flame",
      "age": 1000000,
      "secretIdentity": "Unknown",
      "powers": [
        "Immortality",
        "Heat Immunity",
        "Inferno",
        "Teleportation",
        "Interdimensional travel"
      ]
    }
  ]
}
```

Fig 4.5 Example of JSON

4.2. Week 2

We all have to take udemy courses throughout this week, complete the internships, evaluate(important), and also complete the integrated skills examination. We acquired the programming language of Javascript on week 2. After we have done the online courses, we do the exercise and it is obligatory for all interns to finish the exercise and, after completing the exercises, we use to assess the final overall performance, a brief exam whose markings have been taken into consideration. The main element of this week was the basics of the database and the acquisition of JavaScript. It also covered integrating html with javascript to add functionality.

4.2.1. Javascript

JavaScript (JS) is a programming language with first class features which is lightweight, interpreted or just-in-time compiled. Although the web pages' written language is generally recognised, it is also used by several non-browser contexts including Node.js, Apache CouchDB, Adobe Acrobat and others. JavaScript is a multiparadigm, prototype-based, single-thread, dynamic language, which supports object-oriented, imperative and declarative styles (e.g. functional programming). JavaScript for more. [Read more.](#)

This section is devoted not to web pages or other host environments, nor to the JavaScript language itself. Please consult Web APIs and DOM for details regarding web-specific APIs.

The ECMAScript Specification (ECMA-262) and the ECMAScript Specification of the Internationalization API are the JavaScript standards (ECMA-402). The MDN-wide JavaScript documentation is based on the current ECMA-262 and ECMA-402 draught releases. And if some recommendations for new ECMAScript functions have already been implemented on browsers, these new features might be used in the documentation and examples contained in MDN pages.

Table 4.5 : Data Types

Variable	Explanation	Example
String	This is a sequence of text known as a string. To signify that the value is a string, enclose it in single quote marks.	<code>let myVariable = 'Bob';</code>
Number	This is a number. Numbers don't have quotes around them.	<code>let myVariable = 10;</code>
Boolean	This is a True/False value. The words <code>true</code> and <code>false</code> are special keywords that don't need quote marks.	<code>let myVariable = true;</code>
Array	This is a structure that allows you to store multiple values in a single reference.	<code>let myVariable = [1, 'Bob', 'Steve', 10];</code> Refer to each member of the array like this: <code>myVariable[0], myVariable[1], etc.</code>
Object	This can be anything. Everything in JavaScript is an object and can be stored in a variable. Keep this in mind as you learn.	<code>let myVariable = document.querySelector('h1');</code> All of the above examples too.

The four important types of data structures supported by JavaScript are:

- lists of arrays, for instance ["one", "two", "three," which are JS objects called arrays but are rather array lists as described in Java programming language, as are dynamic. They are array lists.
- records, which are the special JavaS objects, such as {firstName:"Nishant", lastName:"Bhandari"}
- maps, which are also special JavaS objects, such as {"four":4, "two":2, "eight":8}
- Special maps of entity tables where the contents are entity records with a standard slot (or primary key), such that map keys are the standard IDs of those entity records the data as objects using JavaScript, without a difficult translation or parsing..

```
// program to format the date
// get current date
let currentDate = new Date();

// get the day from the date
let day = currentDate.getDate();

// get the month from the date
// + 1 because month starts from 0
let month = currentDate.getMonth() + 1;

// get the year from the date
let year = currentDate.getFullYear();

// if day is less than 10, add 0 to make consistent format
if (day < 10) {
    day = '0' + day;
}

// if month is less than 10, add 0
if (month < 10) {
    month = '0' + month;
}

// display in various formats
const formattedDate1 = month + '/' + day + '/' + year;
console.log(formattedDate1);

const formattedDate2 = month + '-' + day + '-' + year;
```

Fig4.6: Example of Javascript code.

4.3 Week 3

This week we must do all to take udemy courses, complete the training courses, evaluation (essential) and complete the integrated competence exam, which were supplied by the student during the internship. Following our completion of the online udemy courses, we conducted the hands-ons for each intern and then performed a little exam, whose marks were taken into consideration following the completion of the hands-ons, in calculating the total performance overall. Most importantly, the html, css and bootstrap were covered in this week. The design of a webpage is also included.

4.3.1.CSS

The code which styles online content is CSS (Cascading Style sheets). As with HTML, CSS is not a language of programming. Nor is it a language of markup. The language of the CSS is a sheet style. CSS is what you are using for HTML elements selectively.



fig 4.7: CSS rule-set

Since the introduction of Standard Generalized Markup Language (SGML) in the 1980s, style sheets have existed in some way and CSS has been created to give web-based style sheets. For a web style sheet language, style sheets from multiple sources on the web were required. Existing book styles such as DSSSL and FOSI have therefore not been appropriate. On the other hand, CSS permits many sheets in the form of "cascading" styles to impact a document's style.

With HTML growing, a larger range of design options has been developed to fulfil the needs of web developers. This development has allowed the designer to customise the aesthetic of the site more at the expense of sophisticated HTML. Implementation differences in the web browser, such as ViolaWWW and WorldWideWeb, have made it impossible for consumers to consistently see the website and have fewer control over web content. The Tim Berners-Lee browser/editor featured hard-coded sheets of style in the application. Therefore, the style sheets cannot be connected to online documents.

Table4.6: Different Types Of Selector

Selector name	What does it select	Example
Element selector (sometimes called a tag or type selector)	All HTML elements of the specified type.	p selects <p>
ID selector	The element on the page with the specified ID. On a given HTML page, each id value should be unique.	#my-id selects <p id="my-id"> or
Class selector	The element(s) on the page with the specified class. Multiple instances of the same class can appear on a page.	.my-class selects <p class="my-class"> and
Attribute selector	The element(s) on the page with the specified attribute.	img[src] selects but not
Pseudo-class selector	The specified element(s), but only when in the specified state. (For example, when a cursor hovers over a link.)	a:hover selects <a>, but only when the mouse pointer is hovering over the link.

CSS is used in defining styles for your web pages, which include the design, the layout and the variations in display for different devices and screen sizes.

```

body {
  background-color: lightblue;
}

h1 {
  color: white;
  text-align: center;
}

p {
  font-family: verdana;
  font-size: 20px;
}

```

Fig 4.8: CSS example

4.3.2. Bootstrap

Bootstrap is a free open-source CSS frame for responsive mobile web development. The templates for the font, format, button, navigation and other interface components are provided by CSS- (and options for JavaScript).

Bootstrap is a CSS & JS HTML library focused on easing web pages creation (as opposed to web apps). The main objective of the online project is to use the colour, size, font and layout options of Bootstrap for this project. The major consideration is thus whether the responsible developers like these choices. Bootstrap offers fundamental definitions of styles for all HTML components, once added to a project. As a result, the prose, tables and shape components are identical across web browsers. In addition, developers can take advantage of CSS classes defined in Bootstrap to further customize the appearance of their contents. For instance, Bootstrap included tables, page headings, more noticeable pull quotes and text with a highlight for both bright and dark colours. Bootstrap is mostly component in its layout, since it affects a whole web page. As each other element in a page is placed in it, the fundamental layout component is termed "container." Developers can select between a container with fixed width and a container with fluid width. Whereas the latter always fills out the page's width, dependent upon the screen's size, the former utilises one of the five established fixed widths:

- Smaller than 576 pixels
- 576–768 pixels
- 768–992 pixels
- 992–1200 pixels
- Larger than 1200 pixels

Bootstrap is also supplied as jQuery plugins with various JavaScript components. Additional user interface components such as dialogue boxes, tooltips and carousels are available. Each component of the Bootstrap includes an HTML structure, CSS statements and JavaScript code in certain circumstances. They also increase the functionality of some current interface components, such as an automatic function for input fields.

Containers are the most fundamental Bootstrap layout element and are necessary for our default grid system. The containers used are for content containing, padding, and (occasionally) centering. Most containers do not require a nested packet whereas containers can be nested.

Bootstrap comes with the 3 different containers:

- `.container`, which sets a max-width at each responsive breakpoint
- `.container-fluid`, which is width: 100% at all breakpoints
- `.container-{breakpoint}`, which is width: 100% until the specified breakpoint

Table 4.7: Illustrates how each container's max-width compares to the original `.container` and `.container-fluid` across each breakpoint.

	Extra small <576px	Small ≥576px	Medium ≥768px	Large ≥992px	X-Large ≥1200px	XX-Large ≥1400px
<code>.container</code>	100%	540px	720px	960px	1140px	1320px
<code>.container-sm</code>	100%	540px	720px	960px	1140px	1320px
<code>.container-md</code>	100%	100%	720px	960px	1140px	1320px
<code>.container-lg</code>	100%	100%	100%	960px	1140px	1320px
<code>.container-xl</code>	100%	100%	100%	100%	1140px	1320px
<code>.container-xxl</code>	100%	100%	100%	100%	100%	1320px
<code>.container-fluid</code>	100%	100%	100%	100%	100%	100%

With twelve column system, six preset sensitive levels, Sass variables, and mixtures, and dozens of predefined classes, use our powerful mobile initial flexbox grid for designs of all forms and sizes.

A grid is a collection of horizontal and vertical lines that provide a pattern for our design elements. They enable us construct designs that do not overlap or alter width when we go between pages, giving our websites better consistency.

In general, a Grid will have columns, rows and then spaces, usually called gutters, between each row and column.

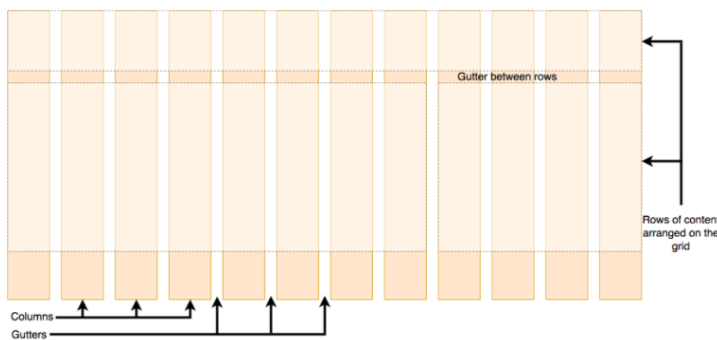


Fig 4.9: Grid System

```

<head>
<title>Bootstrap Example</title>
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1">
<link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css">
<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.3.1/jquery.min.js"></script>
<script src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.js"></script>
<style>
/* Remove the navbar's default margin-bottom and rounded borders */
.navbar {
margin-bottom: 0;
border-radius: 0;
}
/* Set height of the grid so .sidenav can be 100% (adjust as needed) */
.row.content {height: 450px}
/* Set gray background color and 100% height */
.sidenav {
padding-top: 20px;
background-color: #f1f1f1;
height: 100%;
}
/* Set black background color, white text and some padding */
footer {
background-color: #555;
color: white;
padding: 15px;
}
</style>
</head>
<body>
<nav class="navbar navbar-inverse">
<div class="container-fluid">
<div class="navbar-header">
<button type="button" class="navbar-toggle" data-toggle="collapse" data-target="#myNavbar">
<span class="icon-bar"></span>
<span class="icon-bar"></span>
<span class="icon-bar"></span>
</button>
<a class="navbar-brand" href="#">Logo</a>
</div>
<div class="collapse navbar-collapse" id="myNavbar">
<ul class="nav navbar-nav">
<li class="active"><a href="#">Home</a></li>
<li><a href="#">About</a></li>
<li><a href="#">Projects</a></li>
<li><a href="#">Contact</a></li>
</ul>
<ul class="nav navbar-nav navbar-right">
<li><a href="#"><span class="glyphicon glyphicon-log-in"></span> Login</a></li>
</ul>
</div>
</div>
</nav>
<div class="row content">
<!-- FILL NECESSARY CODE FOR COLUMN 1 HERE -->
<div class="col-sm-2 sidenav" id="col1">
<h4>Our Branches </h4>
<br>
<p>394 SW Courtland Drive  
Egg Harbor Township, NJ 08234</p>
<br>
<p>76 East Middle River Street  
Methuen, MA 01844</p>
</div>
<!-- FILL NECESSARY CODE FOR COLUMN 2 HERE -->
<div class="col-sm-8 text-left" id="col2">
<h1>Welcome</h1>
<p>You know, little of this, little of that. Do you have any kahua? I know how he likes to present himself; Father's weakness is vanity, hence the plot. Please see him, Jeffrey. He's a good man, and thorough. They call Los Angeles the City of Angels. I didn't find it to be that exactly, but I'll allow as there are some nice folks there. 'Course, I can't say I seen London, and I never been to France, and I ain't never seen no queen in her damn undies as the fella says. But I'll tell you what, after seeing Los Angeles and thisahere story I'm about to unfold wal, I guess I seen somethin' ever' bit as stupefyin' as ya'd see in any a those other places, and in English too, so I can die with a smile on my face without feelin' like the good Lord cheated me. </p>
<br>

</div>
<!-- FILL NECESSARY CODE FOR COLUMN 3 HERE -->
<div class="col-sm-2 sidenav" id="col3">
<h4>Categories</h4>
<div class="well">
<a href="#">Advice from Our Experts</a>
</div>
<div class="well">
<a href="#">Our Blogs</a>
</div>
<div class="well">
<a href="#">How to Use our Product</a>
</div>
</div>
Logo Home About Projects Contact Login

```

Fig4.10: Bootstrap Sample contains nav-bar and grid system

4.4 Week 4

This week, we all have to fight for the udemy courses given by the trainee, complete the exercise, evaluate (essential), and complete the integrated capacity exam as well. Here we have been using Mysql and sql queries to study the database aspect from scratch. After the online udemy courses we completed the hands-ons and finished all the hands-ons, which is obligatory for all interns and a brief exam, which has been considered to calculate the performance in the final overall performance after the completion of the hands-ons for the evaluation. The most significant element of this week was to cover all fundamental parts of mysql and queries from start since it's extremely vital to get mysql and queries to know.

It also included html and css integrating the database to build a decent website..

Microsoft SQL Server is a Microsoft-developed related database management system. As a database server, it is a product with the principal storage and retrieval function, which may execute either on the same computer or on any machine over the Net as required by other software programmes (including the Internet). A dozen various Microsoft SQL Server versions are sold for Microsoft to diverse audiences and to work from modest single machine applications to massive Internet-specific programmes with a high number of competing customers..

The SQL language is further divided into language elements, which include:

- Clauses that are components of declarations and queries. (They are optional in some circumstances.)
- Expressions that may either output scalar or table values comprising of columns and data rows
- Predict which specifies conditions which may be assessed in the true/false/unknown SQL (3VL) or Boolean truth values and used to limit or adjust programme flows of statements and queries.
- Data collection based on certain parameters. Queries. This is a key SQL component.
- Statements which might maintain or regulate transactions, programme flow, connections, sessions, or diagnoses, in schemes and data;.

4.4.1. SQL Manipulation

Column constraints are the rules applied to the values of individual columns:

- To uniquely identify the row, the PRIMARY KEY limit may be utilised.
- For each row UNIQUE columns have an additional value.
- The value must not be NOT NULL fields.
- DEFAULT sets a default column value if there is no value.

Only one PRIMARY KEY column per table and several UNIQUE columns can be included.

The declaration "CREATE TABLE" establishes a new database table. You can give the table name and the column name in the table.

```
CREATE TABLE student (  
  id INTEGER PRIMARY KEY,  
  name TEXT UNIQUE,  
  grade INTEGER NOT NULL,  
  age INTEGER DEFAULT 10  
);
```

Fig4.11: create table example

Used for adding a new record (row) to a table is the INSERT INTO statement.

It is exhibited in two forms:

- Insert into the columns in order.
- Insert into the columns by name.

```
-- Insert into columns in order:  
INSERT INTO table_name  
VALUES (value1, value2);  
  
-- Insert into columns by name:  
INSERT INTO table_name (column1, column2)  
VALUES (value1, value2);
```

Fig4.12: insert table syntax

To change the columns of an existing table, the ALTER TABLE statement is used. In conjunction with the ADD COLUMN clause, a new column is added..

```
ALTER TABLE table_name  
ADD column_name datatype;
```

Fig 4.13: Alter table syntax

A delete records (rows) from a table is used using the DELETE command. Which records or records to remove is set out in the WHERE clause. All records shall be removed if the WHERE clause is absent.

```
DELETE FROM table_name  
WHERE some_column = some_value;
```

Fig 4.14 Delete Rows in a table

4.4.2.Queries

The declaration SELECT * returns in the result set all columns from the table specified. All columns and records (rows) are retrieved from the film database..

```
SELECT *  
FROM movies;
```

Fig 4.15: Select Statement

The WHERE clause is used to filter records (rows) which correspond to a certain criterion. The query selects all documents in which the pub year 2017 corresponds.

```
SELECT title  
FROM library  
WHERE pub_year = 2017;
```

Fig4.16: Where Statement

For filtering by a range of values the BETWEEN operator can be used. Datas, numbers or text may be the range of values. The query corresponds to any film produced between 1980 and 1990, including.


```
SELECT *
FROM movies
WHERE year BETWEEN 1980 AND 1990;
```

Fig 4.17: Select Query

The ORDER BY clause may be used either alphabetically or numerically to sort the result set by a given column. It is possible to arrange in two ways:

- DESC is a keyword used to sort results in descending order.
- ASC is a keyword used to sort the results in ascending order (default)

```
SELECT *
FROM contacts
ORDER BY birth_date DESC;
```

Fig 4.18 :Order By Query

Multiple criteria can be combined with the AND operator. Both conditions to be included in the outcome set must match records connected with an AND. After 2014, the question corresponds to any blue automobile..

```
SELECT model
FROM cars
WHERE color = 'blue'
AND year > 2014;
```

Fig 4.19: AND Query

Multiple terms can be mixed with the OR operator. Records corresponding to both conditions and OR are included in the results set.

```
SELECT name
FROM customers
WHERE state = 'CA'
OR state = 'NY';
```

Fig 4.20:OR Query

Chapter -5

Conclusion

5.1 Conclusion

I'm still on the road with the trainee and learnt so much from this internship, enabled me to form my personality and equipped me with the understanding of these technologies.

I'm still completing my last internship assignment and will try my best to complete my internship project.

I like to thank the coaches, SMEs and knowledge trainers in advance who have supported me on the complete road of my internship to solve my worries. The coaches, mentor and coach were all fantastic and supported me at all times when I did wrong and moulded my whole internship.

Especially during the internship my mentor spent more effort and asked the superior authority in the company all questions whether they were related to a re-assessment, to the technical problem in the assessment or to extra time to complete the work..

Once I urge my juniors to prepare for the offer in the knowledgeable person and to acquire the internships from the cognizant, because cognizant is a top IT organisation.

Mr Pankaj Kumar and Dr Nafis U Khan sir of the Faculty, thank you for your help and hard work through the entire process of placement, since I know how complicated management is.

Reference

- Cognizant Hand book
- Internship experience
- Assessment
- Cognizant internship curriculum

Project Report Undertaking

I Mr. Nishant Bhandari -Roll No. 171346 Branch CSE is doing my internship with Cognizant from 27/Feb/2021 to 16/Aug/2021

As per procedure I have to submit my project report to the university related to my work that I have done during this internship.

I have compiled my project report. But due to COVID-19 situation my project mentor in the company is not able to sign my project report.

So I hereby declare that the project report is fully designed/developed by me and no part of the work is borrowed or purchased from any agency. And I'll produce a certificate/document of my internship completion with the company to TnP Cell whenever COVID-19 situation gets normal.

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