SOFTWARE DEVELOPMENT ENGINEER IN TEST

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

In

Computer Science Engineering/Information Technology

Submitted By:

Nimesh Bansal (171474)

To

Department of Computer Science & Engineering and Information Technology

Jaypee University of Information Technology Waknaghat, Solan – 173234, Himachal Pradesh

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 work carried out over a period from MARCH 2021 to AUGUST 2021 under the supervision of Mr. **Abhijit Joshi** (Trainer at Cognizant). The matter embodied in the report has not been submitted for the award of any other degree or diploma.

(Student Signature)
Nimesh Bansal, 171474

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

Mr. Abhijit Joshi
(TRAINER COGNIZANT)
Dated: 21st May 2021

Acknowledgment

Any serious and lasting achievement cannot be achieved without the help, guidance, and co-operation of numerous people involved in the work.

First and foremost, We would like to express our gratefulness to the Jaypee University of Information Technology for providing the opportunity for the Internship and help me explore my abilities. 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 their valuable guidance and advice which helped me in landing the internship. Without imparting his knowledge but also his constant supervision, advice, and guidance throughout the placement season, without which this Internship wouldn't have been possible.

I would also thank my other colleagues at the cognizant and my trainer and my mentor without whom going further with this internship wouldn't have been possible. Their knowledge has imparted highly in making this report.

Project Report Undertaking

I Mr /Ms. NIMESH BANSAL Roll No. 171474 Branch INFORMATION TECHNOLOGY is doing my internship with COGNIZANT from 24TH MARCH, 2021 to 16TH AUGUST, 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 the 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 the COVID-19 situation gets normal.

Signature  _____

Name NIMESH BANSAL

Roll No. 171474

Date 21ST MAY, 2021

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Abstract

At the Gen c program in Cognizant, we are divided into certain domains each domain has a specific amount of training period varying from 12 weeks to 19 weeks. The internship includes various events such as educational workshops, webinars, Udemy courses, and group work assignments.

A large IT company based in the United States and India Cognizant employed a large number of Indians last year, and it now employs about 3 lakh employees. The Cognizant Corporation also recruits and hires international workers from all around the globe.

Cognizant provides up various services to a large number of clients in the IT industry they also have ties with one of the fastest-growing companies. Work culture is just as professional as expected

Chapter 1 - INTRODUCTION

1.1 Introduction

At Cognizant, we give organizations the insights to anticipate what customers want and act instantly to deliver on those demands. So they can achieve the goal of every modern business: staying one step ahead of a fast-changing world.

Cognizant is an American multinational technology company that was founded in the year 1994 with the technology unit of Dun & Bradstreet. They offer their services in various fields like Information Technology, Information security, consulting, ITO, BPO, etc. But mainly they have the three areas where they offer their services, these are Digital Business, Digital operations, and Digital Systems and technology.

As of now Cognizant has the withstanding of 281,200 employees globally, from that 150,000 employees are from India across 10 locations.

1.2 About Role

Cognizant offers various roles in the area of Engineering like quality Engineer, Tester, DevOps, and much more but I am assigned with the SDET role that is **SOFTWARE DEVELOPER ENGINEER IN TEST** which means that it is an intermediate point of software developer and a tester role. It is expected that the engineer is professionally apt for Quality engineering And Software Development. The Knowledge of a SDET contains the focus areas of the Testability, Robustness, Software Testing and Development process.

NEED OF SDET

As of now The Industries are focusing on getting more people into organization who can take part in the software development. At the same time, he or she is capable of testing the software. That's why hiring SDET helps them who can see and develop from the perspective of the developing high-performance code or designing the testing framework.

Therefore, the demand of SDET is rising tremendously. Software developer engineer in the test is mainly needed in the following fields:

Some non-tech skills are required as SDET

Skills needed to be an SDET

- Knowledge of C#,.NET, Java, or other programming languages.
- Experience in working with "AGILE + DevOps" process management methodology.
- SDET should know various test methods & corresponding tools like MS Test, NUnit, TestNG, Selenium WebDriver, etc.
- Able to find bottlenecks and thresholds in existing code with the help of automation tools.

- Understanding of Object-Oriented Design.

The Need of SDET normally Vary from one to another but this is required as of cognizant

Roles and Responsibilities as an SDET

- SDET should able to perform Test Automation and setting up frameworks on multiple application platforms like Web, Mobile, and Desktop
- Investigate customer problems referred by the technical support team.
- Create & manage bug reports and communicate with the team.
- Able to build different test scenarios and acceptance tests.
- SDET needs to handle technical communications with Partners to understand client's systems or APIs.
- SDET also works with deployments teams and resolving any level issues for the system.
- DET should also able to set up, maintain, and operate test automation frameworks.

1.3 About Internship

The SDET internship is a 19-week long Internship that starts from Testing as the first topic to start with and Selenium to be the end which is filled with week hands-on and continuous assessments every week followed by a comprised evaluation every month known as ICT (Integrated capability Test). At the end of this internship, we would be assigned to a mini project than to a major one and after then a hackathon is necessary for the complete evaluation of our assessment.

The 19-week long internship comprises of

- Functional Testing
- Java Programming and fundamentals
- web UI/ data source (XPath selenium javascript and bootstrap)
- SQL fundamentals and MySQL serve
- Spring Core, Spring Boot, and MVC

- Microservices
- Automation Concepts, Selenium configuration, Web driver basics
- Selenium Automation Techniques, Dynamic Xpath
- Selenium Web driver With POM and Apache POI
- Automation Testing- Selenium with TestNG
- Digital Technologies
- Project Deliverables

These are the topics that are covered by the cognizant and all have the efficient Udemy lectures to support them and a trainer who gives us continuous support if we are stuck at any point.

As of now, we are only covered till SQL fundamentals and all are pending to be done.

1.4 Organization

- Chapter 2 – Functional testing

  In this chapter, we have discussed our learning of functional testing and the software used to apply those techniques.
- Chapter 3 – java programming and fundamentals

  In this chapter, we have discussed our learning of functional testing and the software used to apply those techniques
- Chapter 4 – web UI/ data source (XPath selenium javascript and bootstrap)

  In this chapter, we have discussed our learning of functional testing and the software used to apply those techniques
- Chapter 5 – Conclusion

  In this chapter, we will discuss our Journey till so far.

Chapter 2 – FUNCTIONAL TESTING

2.1 Overview of the course

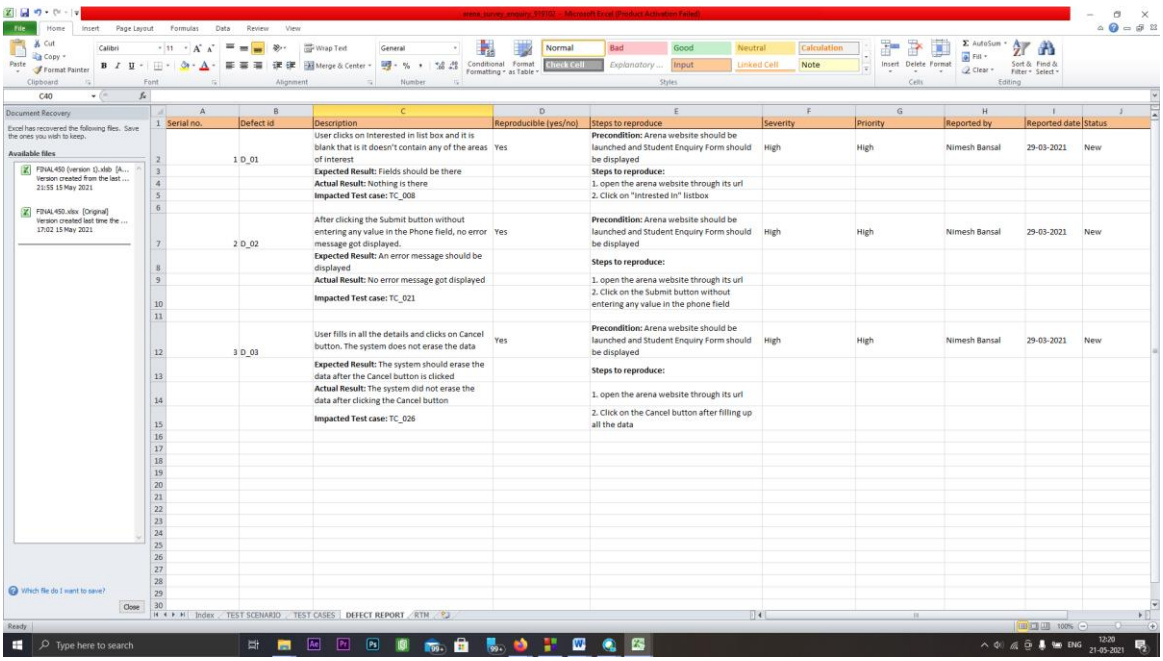
- Basics of Agile methodologies & Agile Testing
- Basics of Functional Testing, Different levels of Functional testing, Test environment setup, Test case design technique, test data creation, test execution, Bug reporting lifecycle, and other essential concepts of software testing.
- Also, you will learn the basics of Automation Testing, Performance Testing, API Testing, Mobile Testing

2.2 Learning's

- Starting with week 1 we have gone through the SDLC Life cycle where what activity is performed over each stage and go to know about the sequential model.
- The V model of the testing
- The process of the testing and its testing and the debugging.
- Leaned different levels of testing like Unit testing, System testing, Beta testing, etc.
- Learned different types of testing like Functional Testing, Black box testing, Regression testing, Smoke testing, etc.
- How to Write a test report and a bug report
- Different types of bugs.
- Agile importance and its 12 principles.
- Invest technique and the Scrum.

2.3 Sample Work for the Testing Report

As a part of this curriculum, we have to make a report of the test scenarios and the bug reports that how we have to report if a bug is detected.



Serial no.	Defect id	Description	Reproducible (yes/no)	Steps to reproduce	Severity	Priority	Reported by	Reported date	Status
1	D_01	User clicks on Interested in list box and it is blank that is it doesn't contain any of the areas of interest **Expected Result:** Fields should be there **Actual Result:** Nothing is there **Impacted Test case:** TC_008	Yes	**Precondition:** Arena website should be launched and Student Enquiry Form should be displayed **Steps to reproduce:** 1. open the arena website through its url 2. Click on "Intrested In" listbox	High	High	Nimesh Bansal	29-03-2021	New
2	D_02	After clicking the Submit button without entering any value in the Phone field, no error message got displayed. **Expected Result:** An error message should be displayed **Actual Result:** No error message got displayed **Impacted Test case:** TC_021	Yes	**Precondition:** Arena website should be launched and Student Enquiry Form should be displayed **Steps to reproduce:** 1. open the arena website through its url 2. Click on the Submit button without entering any value in the phone field	High	High	Nimesh Bansal	29-03-2021	New
3	D_03	User fills in all the details and clicks on Cancel button. The system does not erase the data **Expected Result:** The system should erase the data after the Cancel button is clicked **Actual Result:** The system did not erase the data after clicking the Cancel button **Impacted Test case:** TC_026	Yes	**Precondition:** Arena website should be launched and Student Enquiry Form should be displayed **Steps to reproduce:** 1. open the arena website through its url 2. Click on the Cancel button after filling up all the data	High	High	Nimesh Bansal	29-03-2021	New

Figure 0:1 Bug report

How to Write a Test case

Test Scenario ID	Test case id	Test case description	Prerequisites	Steps to execute	Expected results
TS_01	TC_001	enter the Name field with valid input characters that is less than or equal to 30 characters	Go to arena website and open the student enquiry form	enter a valid name	Name should be displayed
	TC_002	enter the gender radio button	Go to arena website and open the student enquiry form	select the male/female radio button	Gender should be selected
	TC_003	enter the Date of Birth	Go to arena website and open the student enquiry form	enter the DOB in the DD-MM-YYYY form	DOB shoulb be displayed

Figure 0:2 how to write a test case

This was the overall view of what we did in the Testing Course and it was expected from us to learn all this in a week and the end, we got evaluated through the ICT.

Chapter 3 – JAVA PROGRAMMING AND FUNDAMENTAL

Java is a general-purpose language that is class-based and designed to have a few implementation dependencies. The most fascinating thing about java is that it is platform-independent so we can run it on any machine which any problem and recompilation. Normally they are compiled in the form of bytecode that can run on any java machine irrespective of the architecture.

They have some collection frameworks like array lists and maps and sets which implement most things very easy to perform and fast to execute.

As we know that java is Simple, secure, portable, robust, multithreaded, high performance, dynamic, etc. Due to many properties like this, the company made us pursue the code part of this internship in java other than any other language and the backend of java is also java so java was necessary to be learned and that's why this technology is chosen in the coding part.

3.1 Overview of the Course

- Applying Object-Oriented Concept.
- Application of the Collections Framework.
- Advanced Java Concept
    - Asynchronous and Parallel Programming
    - Retrieving Data from a file
    - JDBC and MYSQL
    - Date and Time API

3.2 Learning's

❖ **Week 1of Java**

- Overview, First java program, Variables, Data types, Operators, Conditional statement
- String, Arrays, Looping Statements, Methods, Class, Object, static.
- Access Modifiers, Packages, Inheritance, Abstraction.
- Polymorphism, Encapsulation, Interface, Object Methods
- Assessment 1 of java of all the above syllabus

❖ **Week 2 of Java**

- Collection Framework, Array List, Map, Set.

  We learned all the different types of collections and how to use and call them in Java and all the theoretical part of it like time complexity and use of every specific type of structure.

- File Handling, Annotation, Threads, and Garbage Collections, Exception Handling, Enums

  Here we learned to reading a file and copying a file and use java annotations like @override, @supressWarnings, and multi-threading, and the exception handling was there

- Java 8 Features - Lambda Expressions, Streams, Filters, java. Time.

  Lambda expressions are used to suppress the code and basically, we learned the Date Time API

- Assessment 2 of Java

❖ **Week 3 of Java**

- Streams and Optional. Asynchronous and Parallel Programming in Java 8
- Introduction, Connection, Statement, Prepared Statement, Callable Statement, Transactions, and MetaData.

  In this, we learned how to connect SQL with the java

- Introduction, Connection, Statement, Prepared Statement, Callable Statement, Transactions, and MetaData.
- ICT for Java

3.3 Sample Code to Support The Learning

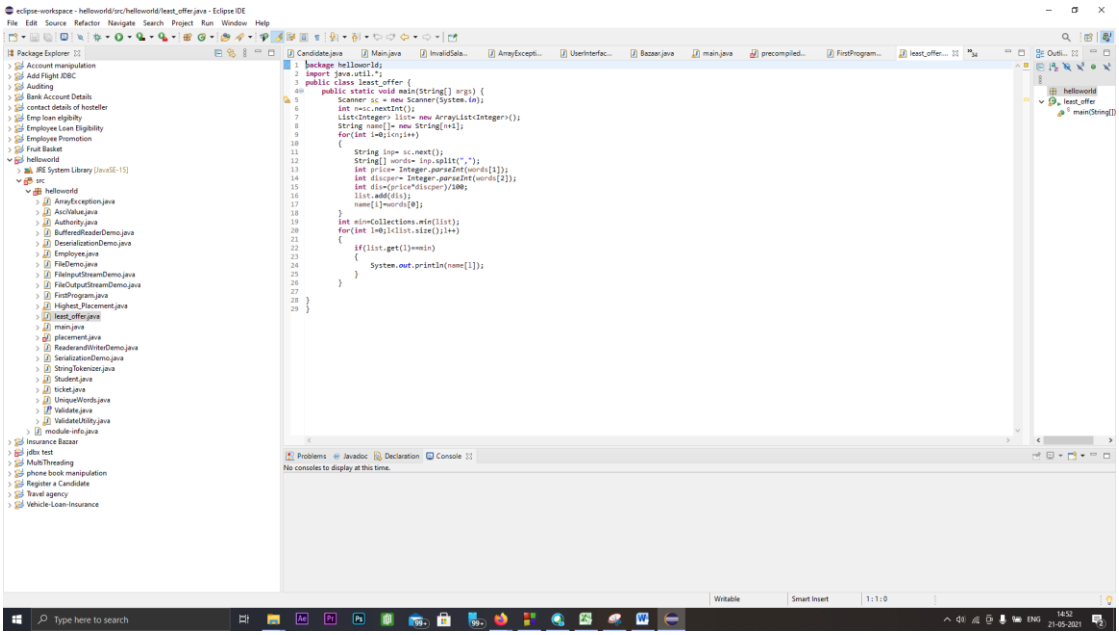


Figure 3. 1 Java Week 1 Learning

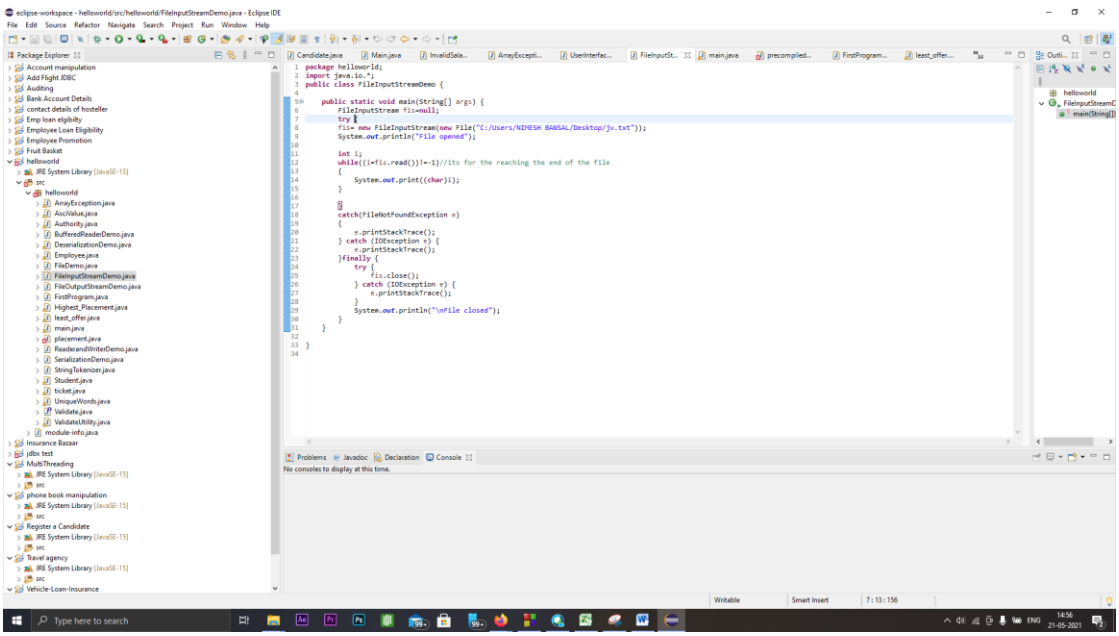


Figure 3. 2 Java week 2 learning

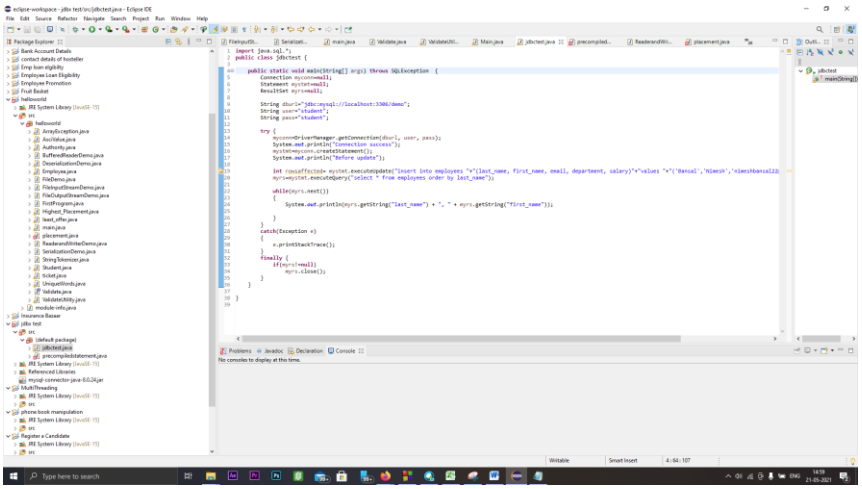


Figure 3. 3 Java week 3 Learning

Chapter 4 - WEB UI/DATA SOURCE

This part of learning has 3 Topics in them one is Xpath, the other is Bootstrap and the Third is SQL. The use of Xpath is mainly in Bootstrap where we can inspect some CSS or elements we found in the external website we can insert into ours or just we have to automate these features we make use of Xpath with java to run them.

4.1 Overview

- Understand HTML fundamentals
- Identify HTML(WebUI) elements using different locators, Create customize Xpath, demonstrate XPath and CSS in Selenium WebDriver Scripts.
- Apply how Javascript works and its fundamental concepts required for Selenium Automation.
- Understand SQL and perform basic Database operations using the MySQL database.
- Understand the fundamentals of XML and JSON. How to create XML and JSON files.

4.2 Technology Used

- WebUI Concepts - HTML, CSS, Xpath
- JavaScript
- SQL and Database fundamentals
- XML & JSON

4.3 Learning's

❖ **Week 1**

- We learned the basics of the Xpath of how to select and inspect them and the same we did for the CSS selectors.
- Performed some hands-on and then moved to learn JSON and XML
- Learned Api Technical writing where we almost write the JSON and XML

file of the scheme we were given in the form tables and we have to convert them to JSON and XML.

- Moved to JavaScript Basics
- Assessment of XML

❖ **Week 2**

- Objects, Errors and debugging, Functions of the JavaScript and did some hands-on
- Bootstrap Basics and some hands-on
- Navbars and Flexbox, The Magical Grid system, Cards, and List Groups
- DDL and DML of the SQL
- Assessment of the JavaScript

❖ **Week 3**

- Hands-On of the SQL and Learn some advanced topics like pivoting and ranking and aliasing of the data and create our function in the SQL.

4.4 Sample Codes For The Learning

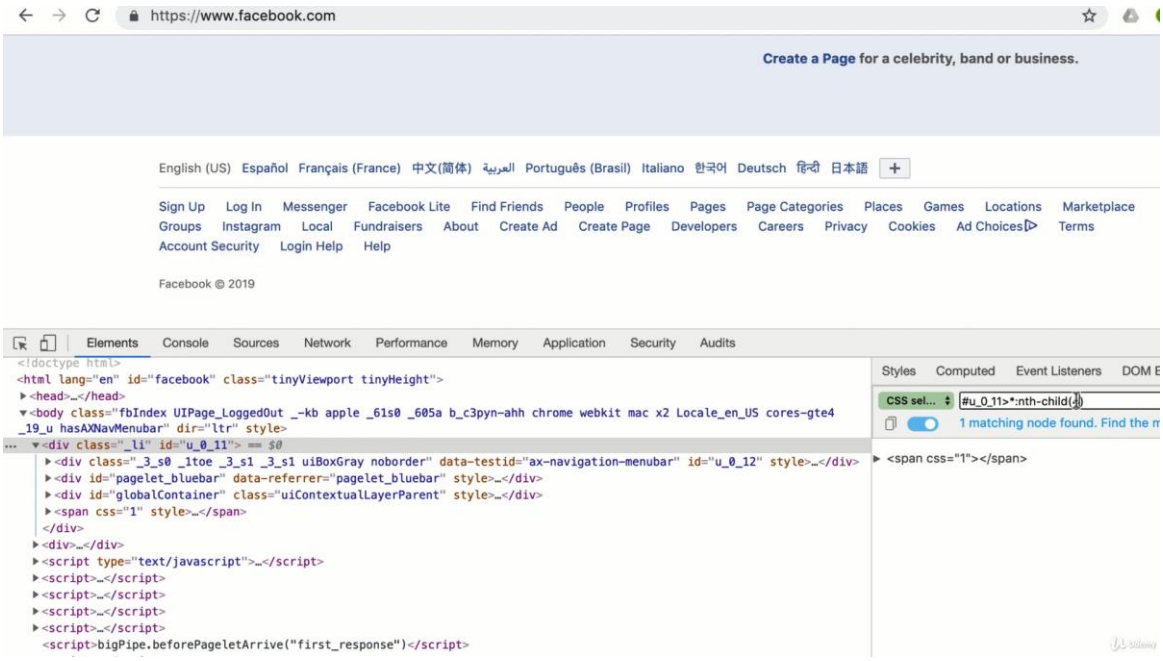


Figure 4. 1 week1 Xpath

Employee.xml

```xml
<Department>
    <Employee>
        <empid>1001</empid>
        <name>Tom</name>
        <salary>20000</salary>
        <email>tom@gmail.com</email>
        <phoneno>9874563210</phoneno>
    </Employee>
    <Employee>
        <empid>1002</empid>
        <name>Sam</name>
        <salary>25000</salary>
        <email>sam@gmail.com</email>
        <phoneno>7876545676</phoneno>
    </Employee>
    <Employee>
        <empid>1003</empid>
        <name>Shiny</name>
        <salary>20000</salary>
        <email>shiny@gmail.com</email>
        <phoneno>9874563210</phoneno>
    </Employee>
</Department>
```

Figure 4. 2 XML Api writing Week 1

index.html ★ script.js

```javascript
function validate(){
    var name=document.getElementById("name").value;
    var mobile = document.getElementById("mobile").value// Fill your code to get the mobile number element - by id "mobile" and store it in the variable "mobile"
    var email = document.getElementById("email").value// Fill your code to get the emailid element - by id "email" and store it in the variable "email"
    // HINT: use the above "name" as sample to get "mobile" and "email"
    if(validateName(name) && validateMobile(mobile) && validateEmail(email))
        document.getElementById("result").innerHTML = "Valid Values in form";
    else
        document.getElementById("result").innerHTML = "Invalid Values in form";
}
function validateName(name){
    var letters = /^[A-Za-z]+$/;
    // Fill your code here
    // HINT : using the syntax => name.match(letters)
    // find whether 'name' contains alphabets only. 'match' method returns true, if 'name' contains only alphabets.
    // Return true or false
    if(name.match(letters))
    return true;
    else
    return false;
}
function validateMobile(mobile){
    var digits = /^[0-9]+$/;
    // Fill your code here
    // HINT : using the syntax => mobile.match(digits)
    // find whether 'mobile' contains numbers only. 'match' method returns true, if 'mobile' contains only numbers.
    // Return true or false
    if(mobile.match(digits))
    return true;
    else
    return false;
}
function validateEmail(email){
    // Fill your code here to check whether the 'email' has '@' symbol and '.' symbol
    // HINT : email.includes("@") will return true, if the email has '@' symbol.
    // find whether email has both '@' and '.'
    // Return true or false
    if(email.includes("@") && email.includes("."))
    return true;
    else
    return false;
}
```

Figure 4. 3 Javascript with HTML Week 2

result.sql

```sql
with rank_customer (customer_name,claim_amount, rank) as (
    select
        c.first_name,
        sum(claims.amount_of_claim),
        rank() over(order by sum(claims.amount_of_claim)desc) rnk
        from customer c
         join customer_policy cp on c.id = cp.customer_id
         join claims on cp.id = claims.customer_policy_id
         group by c.first_name)
select customer_name, claim_amount, rank
    from rank_customer
    order by rank ASC
GO
```

Figure 4. 4 SQL week 3

Chapter 5 - CONCLUSIONS

5.1 Conclusions

The Journey Till Cognizant is pretty good as every new day we have new challenges and task to complete them, so we challenge ourselves every day so we can learn something good and can use that knowledge in the growth of the company.

The task provided by the cognizant is a real-world problem which we face in our daily life's and these skills taught by the Cognizant has helped in a personal way to learn things and understand our surrounding and stuff practically.

This is a 19-week Internship but so far only 7 weeks are completed and all the detailed analysis of each topic has been attached in the report with the sample work has been attached.

REFERENCES

[1] Wikipedia

[2] Cognizant Handbook

[3] cognizant courses

[4] cognizant Assessment