Automation Testing

EPAM

A Training Report

Submitted in partial fulfillment of the requirements for the award of degree of

Bachelor of Technology Computer Science and Engineering

(Automation Testing)

LOVELY PROFESSIONAL UNIVERSITY PHAGWARA, PUNJAB

From 12/01/2023 to Present

SUBMITTED BY

Name of the student:Gunnepalli Dileep Mahadevan

Registration Number: 11907644

Signature of the student: Dileep

SUBMITTED TO

Name of the supervisor:Sakshi

Designation:

Signature of the supervisor:

Student Declaration

To whom so ever it may concern

I, Dileep, 11907644, hereby declare that the work done by me on

"AUTOMATION TESTING" from 12th Jan-2023 to Present, under the supervision and Name of Internal supervisor - Sakshi Lovely Professional University,

Phagwara, Punjab, is a record of original work for the partial fulfilment of the requirements for the award of the degree Computer Science and Engineering.

Name of the Student (Registration Number)

Gunnepalli Dileep Mahadevan 11907644

Dated: 05/05/2023

Declaration by the supervisors To whom so ever it may concern

This is to certify that Gunnepalli Dileep Mahadevan 11907644 from Lovely Professional University, Phagwara, Punjab, has worked as a trainee in EPAM on "AUTOMATION TESTING" under my supervision from 12th Jan,2023to Present. It is further stated that the work carried out by the student is a record of original work to the best of my knowledge for the partial-fulfillment of the requirements for the award of the B-TECH, Computer Science and Engineering.

Name of the External Supervisor	Name of Internal Supervisor: Sakshi
Human Resource Manager	Assistant Professor
Designation of the external Supervisor	Designation of the internal Supervisor
Signature of the external Supervisor	Signature of the external Supervisor
Dated:	Dated:

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Undertaking by the student for submitting Final Certificate of six months/one year Internship/OJT

Reg No. 11907644 Student Name: Gunnepalli Dileep Mahadevan

Program Name: B Tech, CSE Course Code: CSE441

Batch Year: 2019-2023 Mobile No:8688634488

I understand that I have been provisionally allowed to appear for the ETP viva and I hereby declare that since I am on 4 months Internship/OJT, thus I shall submit my final

certificate of 4 months Internship/OJT to university after completion of my Internship/OJT

I am aware that in case, I am unable to submit the same till the above-mentioned date, my final evaluation of internship/OJT shall be discarded by the university, and I grade shall be awarded in the result.

Signature of Student Signature of TPC-School Signature of HOS

Chapter-1

INTRODUCTION TO COMPANY

1.1 About EPAM

Since 1993, EPAM Systems, Inc. (NYSE: EPAM) has benefited from its background in sophisticated software engineering to become the leading provider of services for digital transformation globally, setting the standard for services related to the development of digital platforms and physical products. EPAM's globally deployed hybrid teams enable better enterprise, education, and health platforms that connect people, optimise experiences, and enhance people's lives through their innovative strategy, integrated advisory, consulting, and design capabilities, and distinctive "Engineering DNA." EPAM was admitted to the S&P 500 and the Forbes Global 2000 list of companies in 2021.

Deloitte & Touche publicly ranked EPAM as a fast-growing business in 2002 for the first time. The business joined the London Stock Exchange the same year, becoming the first Russian participant.

The first Belarusian firm to be listed on the NYSE was EPAM, which went by the name EPAM in 2012.

In order to broaden its offshore services outside of North America, EPAM purchased Budapest, Hungary-based Fathom Technology, a provider of software development services. To finance its aggressive growth objectives, EPAM obtained an equity investment from Siguler Guff in 2006.

With the 2006 acquisition of VDI, a provider of software development services with offices in Russia, EPAM increased its market reach throughout the CIS. CEO of EPAM Arkadiy Dobkin was recognised by Consulting Magazine as one of the Top 25 Most Influential Consultants of the Year in that particular year.

In the latter half of 2012, EPAM acquired two companies: Thoughtcorp, which increased the scope of its Agile, business intelligence, and mobile service offerings; and Empathy Lab,

which created a digital engagement practise with a focus on eCommerce, user experience, and design.

EPAM made two acquisitions in 2018 to expand its service offerings: Continuum (now EPAM Continuum) and TH_NK to add consulting capabilities and develop its digital and service design practices. Also that year, EPAM launched InfoNgen®, a text analytics and sentiment analysis enterprise software product that uses artificial intelligence.

The company also productized TelescopeAI®, an artificial intelligence-based platform for IT operations and workforce management, which won a 2019 Big Innovation Award presented by the Business Intelligence Group.

In 2019, EPAM joined the Blockchain in Transport Alliance (BiTA). That year, the company launched EPAM Continuum, its service for business, experience and technology consulting.

The company also launched EPAM SolutionsHub, a catalogue of its software products, accelerators and open source platforms. As part of its SolutionsHub launch, EPAM also released the Open Source Contributor Index (OSCI), a tool that ranks the top open-source contributors by a commercial organization.

In August 2021, EPAM expanded its presence in Latin America through the acquisition of Colombia-based S4N, a software development services firm specializing in the design and development of modern software products and enterprise platforms.

In July 2021, EPAM acquired CORE SE, a professional service provider specializing in IT strategy and technology-driven transformations, to further expand its Western European footprint in the DACH region.

In May 2021, EPAM acquired Just-BI, a Netherlands-based consultancy specializing in SAP/S4HANA and enterprise data and analytics program management.

EPAM acquired Israel-based cybersecurity services provider White-Hat Ltd. in May 2021.

In April 2021, EPAM acquired PolSource, a Salesforce Consulting Partner with more than 350 Salesforce specialists across the Americas and Europe.

In December 2021, EPAM joined the S & P 500 American market index.

In May 2021, EPAM Systems ranked 1,804 on the Forbes Global 2000 list.

In 2022, EPAM announced several strategic acquisitions and investments, including a majority stake in U.S. software firm Contino and a minority stake in U.K. AI-driven data analytics firm Noodle.io

Selected by Newsweek as a 2021 Most Loved Workplace, EPAM's global multi-disciplinary teams serve customers in more than 45 countries across five continents. As a recognized leader, EPAM is listed among the top 15 companies in Information Technology Services on the Fortune 1000 and ranked as the top IT services company on Fortune's 100 Fastest-Growing Companies list for the last three consecutive years. EPAM is also listed among Ad Age's Top 25 World's Largest Agency Companies for three consecutive years, and Consulting Magazine named EPAM Continuum a top 20 Fastest-Growing Firm.

61,000 TOTAL EPAMERS (Data for Q1 2022) | 45+ COUNTRIES (Data as of Q1 2022) | $1.172B Q1 2022 REVENUE (Data as of Q1 2022) | 27% Revenue Growth 5 Year Revenue CAGR (2016-2021)

EPAM India is one of the best Product Development Services companies in India with a 'startup-like culture' and leverages our global Engineering Excellence practices and borderless delivery model to provide unique career opportunities to our employees and best-in-class digital solutions to our customers. Our teams help our customers be more competitive and disruptive in the marketplace. We adopt a global growth strategy, thinking and acting like start-ups, working in multidisciplinary global teams, and delivering results relentlessly.

5,500+ EPAMERS (100% growth in 2021) | 150+ ACTIVE CUSTOMERS | 05 OFFICE LOCATIONS (Hyderabad, Pune, Bangalore, Gurgaon, Chennai).

MARKET POSITION:- EPAM is a leading global provider of software product development and digital platform engineering services to hundreds of Fortune 500 and 1000 clients located around the world, primarily in North America, Europe, Asia and Australia. We focus on building long-term partnerships with customers, enabling them to reimagine their businesses through a digital lens. Our industry expertise includes financial services, travel and consumer, software and hi-tech, business information and media, life sciences and healthcare, as well as other emerging industries.

VALUE PROPOSITION:- EPAM helps its customers thrive in a market constantly challenged by the pressures of digitization, delivering true end-to-end value through our innovative and scalable software solutions, best-in-class business consulting and experience design, and a continually evolving mix of advanced capabilities. Our historical core competency in software development and product engineering, as well as our work with global enterprise leaders and emerging technology companies, created the foundation for our evolution of other offerings, which include advanced technology and intelligent enterprise solutions and innovative digital engagement. This combination, along with our deep industry-specific domain expertise, helps us speed our customers' digital transformation journeys.

EPAM'S UNIQUE APPROACH:- Over the past 25 years, we have helped our customers through each wave of technology change, building solutions that help them level the playing field and stay competitive through constant market disruption. Using our software engineering heritage as a foundation, we continue to disrupt ourselves by deepening our technology experience and adding strategic business and innovation consulting, design thinking and physical-digital capabilities to provide business value through human-centric innovation.

1.2- Company's Vision and Mission

EPAM Systems is a digital platform engineering and software development company that has a clear and concise vision and mission statement. Their vision is to be recognized as a leading technology company that delivers innovative solutions to its clients and helps them to transform their businesses. This shows that they aspire to be at the forefront of the industry, constantly pushing the boundaries of what is possible to help their clients succeed.

Their mission statement is focused on creating meaningful software solutions that enable their clients to achieve their business objectives and deliver value to their customers. They emphasize the importance of being a trusted partner to their clients, providing exceptional service and expertise in the latest technologies. This highlights their commitment to delivering quality solutions and building long-term relationships with their clients.

EPAM Systems also values diversity and inclusion, as evident in their mission statement. They are committed to building a diverse and inclusive culture where their employees can thrive and grow professionally. This shows that they recognize the importance of fostering an environment that values differences and encourages collaboration and innovation.

Overall, EPAM Systems' vision and mission statement reflect their dedication to providing innovative solutions, delivering exceptional service, and fostering a diverse and inclusive culture.

In addition to their focus on providing innovative solutions, EPAM Systems values diversity and inclusion. They are committed to building a diverse and inclusive culture where their employees can thrive and grow professionally. They recognize the importance of fostering an environment that values differences and encourages collaboration and innovation.

EPAM Systems also places a strong emphasis on continuous improvement. They are dedicated to staying up-to-date with the latest technologies and industry trends, and they strive to incorporate this knowledge into their work to deliver the best possible solutions to their clients.

In summary, EPAM Systems' vision and mission statement reflect their dedication to providing innovative solutions, delivering exceptional service, fostering a diverse and inclusive culture, and continuously improving their work. They are committed to helping their clients succeed and building long-term partnerships based on trust and collaboration.

EPAM Systems Mission Statement:

To become the transformation platform for adaptive enterprises.

EPAM Systems Vision Statement:

No one has added EPAM Systems' vision statement yet.

EPAM Systems Values:

- VALUE THE INDIVIDUAL
- FOCUS ON THE CUSTOMER
- ACT AS A TEAM
- STRIVE FOR EXCELLENCE
- ACT WITH INTEGRITY

1.3-Origin and Growth of the company

EPAM Systems is a global technology and software engineering company that provides a wide range of IT solutions and services to clients worldwide. The company's success is built on a foundation of strong core values that guide its operations and shape its culture. Here is the EPAM Systems Company Core Values statement:

1. Strive for excellence: We are committed to delivering exceptional quality and value to our clients through continuous improvement, innovation, and an unwavering focus on excellence.

2. Respect and care: We treat our clients, employees, and partners with respect, fairness, and empathy, and we strive to create a work environment that is safe, diverse, and inclusive.

3. Collaborate and communicate: We believe that teamwork and communication are essential for success, and we encourage open, honest, and constructive dialogue to foster trust, respect, and collaboration among our team members.

4. Take ownership: We take ownership of our work and hold ourselves accountable for delivering results that meet or exceed our clients' expectations.

5. Be proactive: We anticipate and respond to our clients' needs quickly and efficiently, and we take a proactive approach to solving problems and delivering solutions that drive business success.

6. Embrace change: We embrace change as an opportunity for growth and innovation, and we are constantly adapting to new technologies, markets, and business models to stay ahead of the curve.

7. Act with integrity: We act with honesty, integrity, and transparency in all our business dealings, and we strive to build strong, lasting relationships based on trust and mutual respect.

EPAM Systems' Company Core Values are not just words on a page; they are the guiding principles that shape our culture, drive our performance, and inspire us to be our best selves every day.

EPAM Systems is a global provider of digital platform engineering and software development services. The company was founded in 1993 by Arkadiy Dobkin in Princeton, New Jersey. Dobkin, who remains the CEO to this day, started the company with just a few employees and focused on providing software development services to businesses in the United States.

In the early years, EPAM focused on developing custom software solutions for clients in industries such as healthcare, finance, and retail. However, as the company grew, it expanded its offerings to include digital platform engineering, product development, design thinking, and other services to help clients navigate the digital landscape.

In 2002, EPAM established its first development center in Minsk, Belarus, which allowed the company to tap into a highly skilled talent pool and offer cost-effective solutions to clients. This move was a game-changer for EPAM, as it allowed the company to scale its services quickly and efficiently.

Over the years, EPAM continued to expand its global presence through both organic growth and strategic acquisitions. In 2012, the company went public on the New York Stock Exchange (NYSE) under the ticker symbol EPAM. Today, EPAM has a team of over 50,000 professionals working across the globe and serves clients in more than 35 countries.

EPAM's success can be attributed to its focus on innovation, customer-centric approach, and commitment to delivering exceptional quality and value to its clients. The company has received numerous industry recognitions and awards, including being named a Leader in the Gartner Magic Quadrant for Application Services for six consecutive years.

In addition to its core software development and digital engineering services, EPAM has also invested heavily in emerging technologies such as artificial intelligence (AI), machine

learning (ML), blockchain, and the Internet of Things (IoT). This has allowed the company to stay at the forefront of technological innovation and provide cutting-edge solutions to clients across a wide range of industries.

EPAM Systems is a leading software engineering services provider, specializing in product development, digital platform engineering, and digital and product design. The company was founded in 1993 in Princeton, New Jersey, by Arkadiy Dobkin, and has since grown to become a global organization with over 43,000 employees across 35 countries.

Arkadiy Dobkin, a software engineer, founded EPAM Systems in 1993 in Princeton, New Jersey. Dobkin had immigrated to the United States from Minsk, Belarus, in the late 1970s, and he saw an opportunity to provide high-quality software engineering services to American companies.

Initially, EPAM focused on providing software development services to companies in the financial services industry. The company quickly gained a reputation for its expertise in the field, and in 1998, it opened a development center in Minsk, Belarus.

1.4-Various departments and their functions

EPAM Systems is a global digital platform engineering and software development company that provides a wide range of services, including consulting, product design, engineering, and testing. The company has a diverse range of departments, each with its own functions, which play a critical role in ensuring that EPAM delivers high-quality services to its clients. In this report, we will provide an overview of EPAM's various departments and their functions.

1. Delivery Department:

The delivery department is responsible for ensuring that EPAM's services are delivered on time, within budget, and to the highest quality standards. This department is responsible for managing project teams and coordinating with clients to ensure that their needs are met. They

also work to identify risks and develop plans to mitigate them. The delivery department is composed of project managers, technical leads, business analysts, and quality assurance analysts.

2. Technology Department:

The technology department is responsible for researching and developing new technologies, tools, and methodologies that can be used to improve EPAM's services. This department is composed of software engineers, architects, and researchers who work on cutting-edge technologies such as artificial intelligence, machine learning, and blockchain. They also work closely with the delivery department to ensure that the new technologies and tools are properly integrated into EPAM's service offerings.

3. Consulting Department:

The consulting department is responsible for providing strategic advice and guidance to EPAM's clients. This department is composed of consultants who work with clients to identify their business needs and develop strategies to address them. They also work to identify opportunities for growth and improvement in clients' operations.

4. Sales Department:

The sales department is responsible for identifying and securing new business for EPAM. This department is composed of sales representatives who work to build relationships with potential clients, identify their needs, and propose solutions that meet their requirements. They also work to negotiate contracts and ensure that clients are satisfied with EPAM's services.

5. Human Resources Department:

The human resources department is responsible for recruiting, training, and managing EPAM's workforce. This department is composed of recruiters, trainers, and human resources managers who work to identify talented individuals, provide them with the training and support they need to succeed, and ensure that they are properly compensated and rewarded for their work.

6. Marketing Department:

The marketing department is responsible for promoting EPAM's services and building brand awareness. This department is composed of marketers who work to develop marketing strategies, create promotional materials, and build relationships with industry influencers and media outlets.

7. Finance Department:

The finance department is responsible for managing EPAM's financial resources. This department is composed of financial analysts, accountants, and financial managers who work to ensure that EPAM's financial operations are efficient, effective, and compliant with relevant regulations.

CHAPTER-2

INTRODUCTION TO PROJECT

Throughout the period of the internship, we learned a lot of skills. Every skill that we learned or gained have different scopes and each skill plays a vital role in our lives. The scope of some skills that we learned are mentioned below:

- Teamwork
- Problem solving
- Co-ordination
- Interpersonal Skills
- Time Management

Training Undertaken:

Automation Testing using selenium and java

Automation testing is a software testing technique that involves the use of automated tools to execute test cases and verify the expected results. It is a way of automating repetitive and time-consuming manual testing tasks, thus increasing the efficiency and accuracy of software testing.

Selenium is an open-source testing framework that provides a suite of tools for web application testing, and Java is a widely used programming language that is well-suited for writing test scripts.

Objectives of the work undertaken:

The objectives of automation testing are to improve test efficiency, accuracy, coverage, reliability, and cost-effectiveness, while also reducing the time and effort required for testing.

Scope of the Work:

The scope of work in automation testing using Selenium and Java is vast and includes various tasks such as creating test cases, test scripts, and test suites; executing automated tests; analyzing test results; debugging errors; and reporting bugs.

Roles and Responsibilities of an Automation Tester:

Test planning: Work with the testing team and project stakeholders to define the scope and objectives of the automation testing project, identify the test scenarios and requirements, and determine the testing approach and tools to be used.

Test design: Design the test cases and scripts, define the test data and input parameters, and identify the expected results and acceptance criteria.

Test execution: Implement the test scripts using Java and Selenium WebDriver, execute the test cases on multiple browsers and platforms, and verify the expected results.

Test reporting: Generate test reports and metrics, track the test execution progress and status, and report any defects and issues.

Test maintenance: Update the test scripts and data as needed, maintain the test automation framework, and ensure the test environment is up to date.

Collaboration: Collaborate with the development team to identify and address defects and issues, and work closely with the project stakeholders to ensure the testing meets the project requirements.

Some specific roles and responsibilities of an automation tester using Selenium and Java may include:

- Developing, maintaining, and executing automated test scripts using Java and Selenium WebDriver.
- Ensuring the test scripts are modular, reusable, and scalable, and following the best practices for automation testing using Selenium and Java.
- Identifying and troubleshooting issues and defects in the test scripts and the tested software and reporting them to the appropriate stakeholders.

- Collaborating with the development team to understand the software requirements and design, and to ensure the testing covers all the relevant functional and non-functional aspects.
- Creating and maintaining test data and input parameters, and ensuring they are accurate and appropriate for the test scenarios.
- Ensuring the test environment is set up correctly and meets the requirements for the tested software and the test scenarios.
- Analyzing test results and metrics and providing recommendations for improving the testing process and the tested software.

About Projects we have Done

We have done two projects.

- Group project
- Individual project

2.1-Group Project

Testing the user interface (UI) of Twitter using automation testing involves creating automated test scripts that simulate user actions and interactions with the Twitter application. This can be done using Selenium WebDriver and Java.

Some examples of UI tests that we performed using automation testing on Twitter include:

- Login and Logout Testing: Verify that the user can login to Twitter using valid credentials and logout from the application.
- Tweet Creation Testing: Verify that the user can create and post a tweet, and that the tweet appears on the user's timeline.
- Search Functionality Testing: Verify that the user can search for specific tweets, hashtags, or users, and that the search results are accurate and relevant.

4.User Profile Testing: Verify that the user can view and edit their profile information, including their bio, profile picture, and privacy settings.

5.Notification Testing: Verify that the user receives notifications for new tweets, mentions, and direct messages, and that the notifications are accurate and timely.

In the Twitter website we used locaters , dependencies , plugins, repositories like maven tool, plugins like pom.xml etc

In the project first we created new project and added Maven archetype quickstart

And then pom.xml file we will be created. And in pom.xml file we added dependencies like

Bonigarcia , Junit, selenium , testing.

Dependencies like Bonigarcia, JUnit, Selenium, and TestNG are used in IntelliJ IDEA to enable and support testing of Java-based applications.

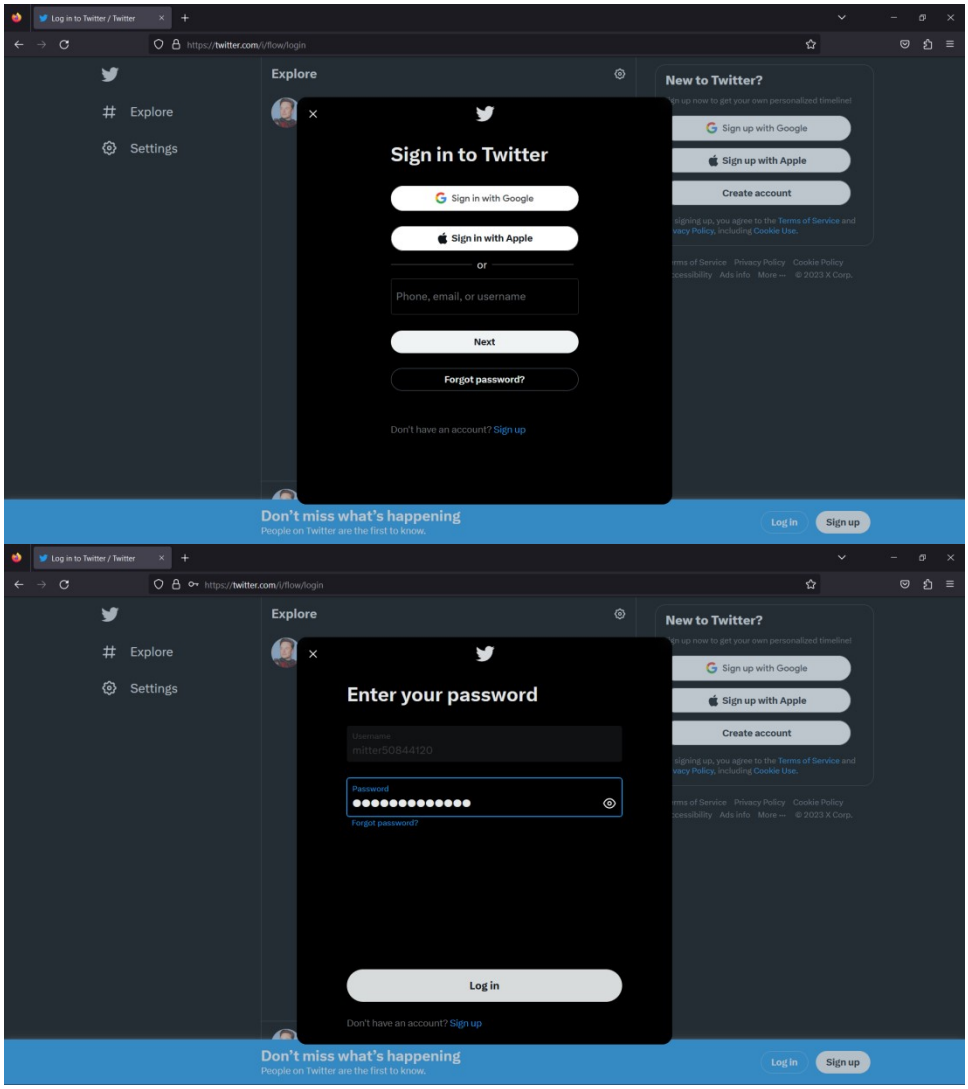
And we implemented the code using Page Object. By using Page Object, it is a design pattern and creates Object Repository for web UI elements. The advantage of the model is that it reduces code duplication and improves test maintenance.

We created com.browser in main . In it we will give the code whether it should open in which browser by using webdriver .

After that we created separate classes for Login page , Logout , Post Page, Profile Page , Search Page , Select Tweet.

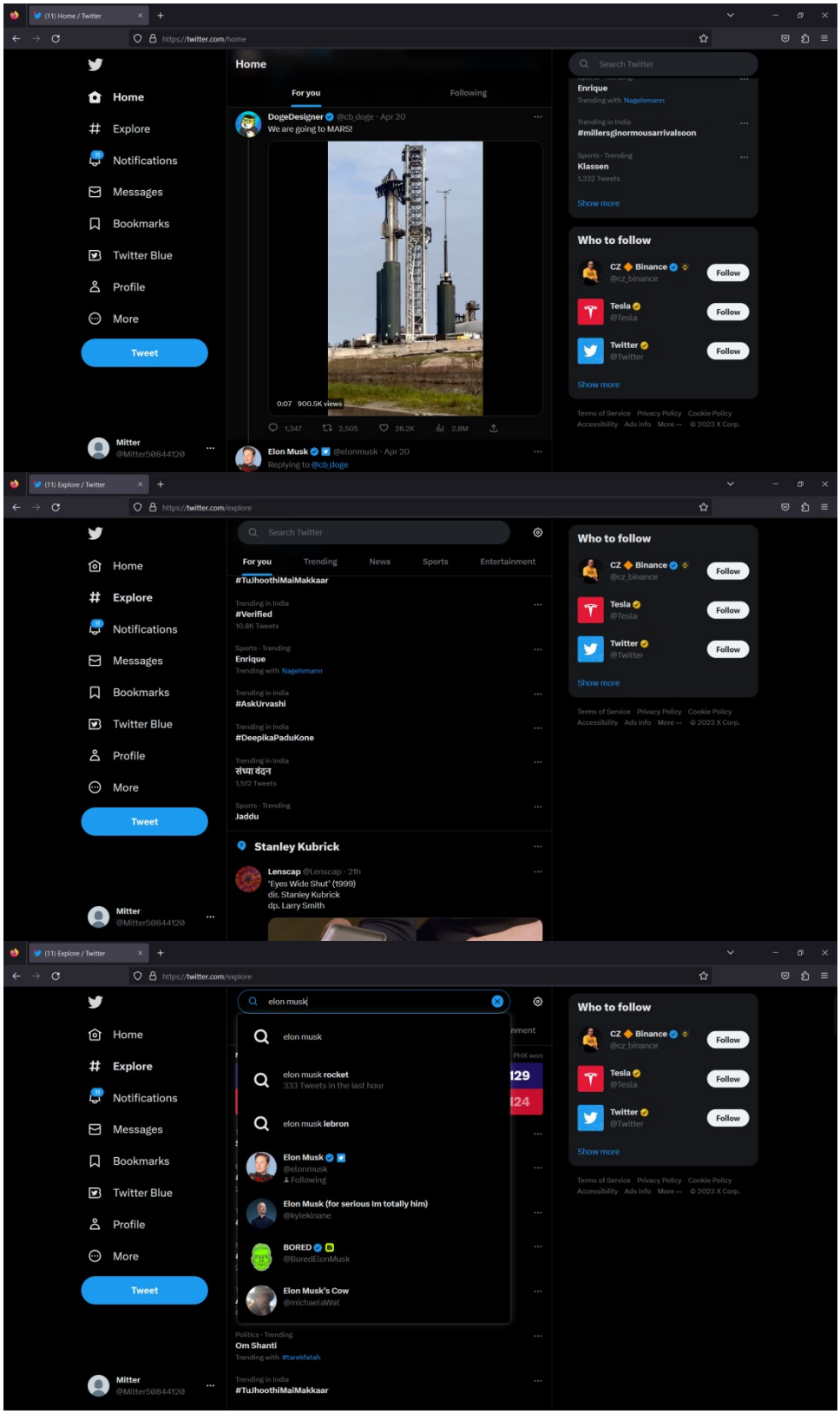
In Login page we used Annotation Type FindBy and by using xpath

Fig 2.1



By using credentials, we login to the website by clicking on the login button

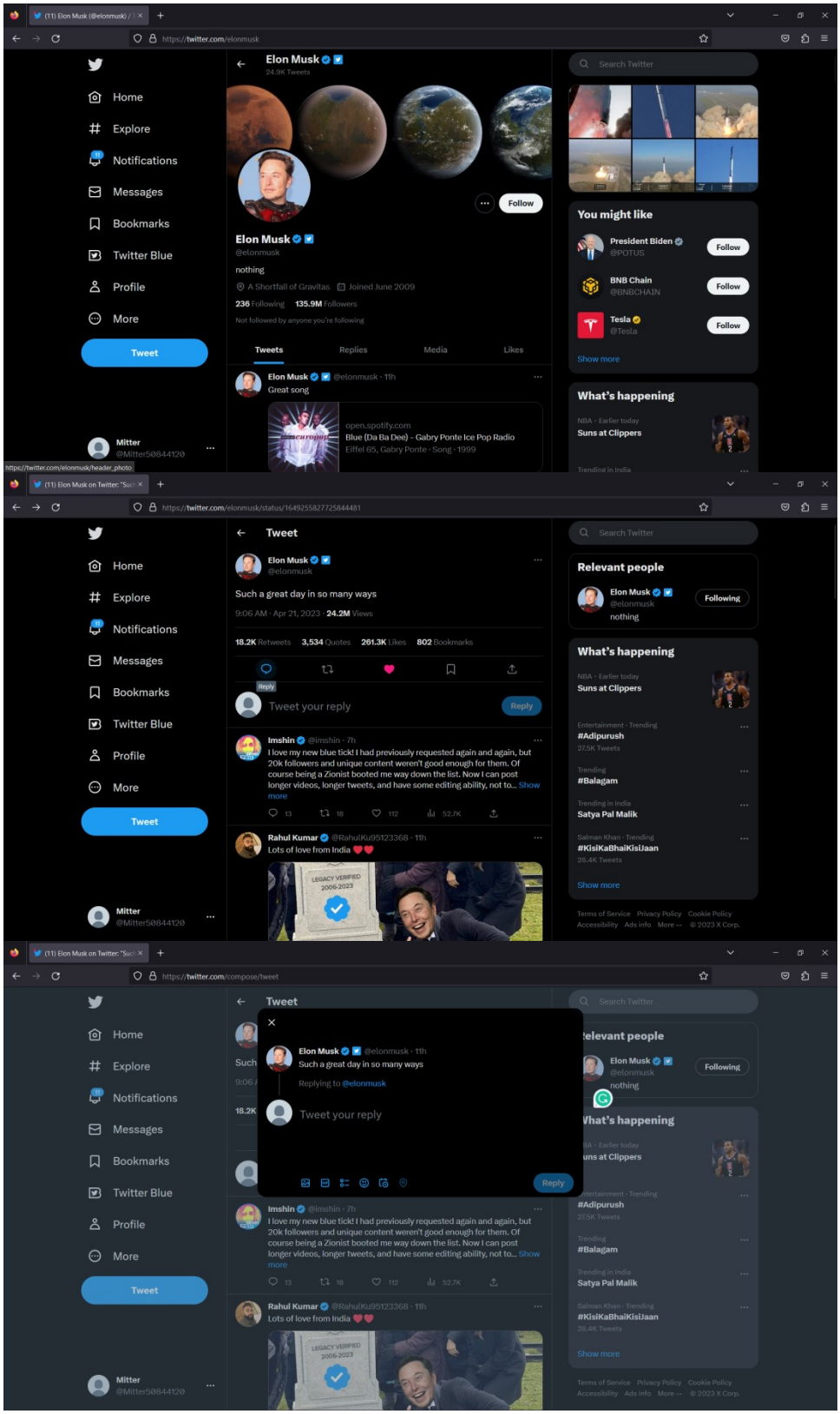
Fig 2.2



This fig 2.2 shows that, it will login to the home page and search for the selected person

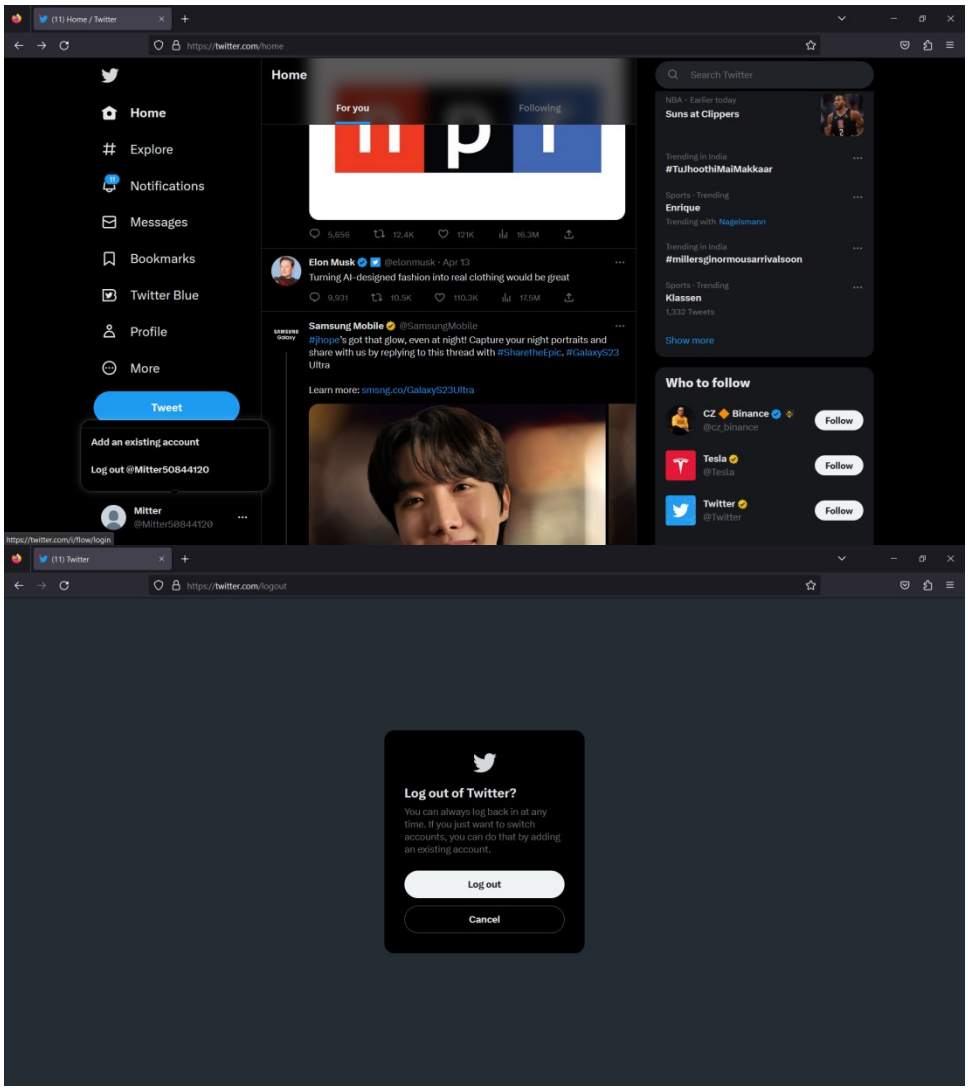
And click on that person

Fig 2.3


Elon Musk
Home
Explore
Notifications
Messages
Bookmarks
Twitter Blue
Profile
More
Tweet
Follow
nothing
Tweets
Replies
Media
Likes
Great song
You might like
President Biden
BNB Chain
Tesla
What's happening
Suns at Clippers
Such a great day in so many ways
Relevant people
Following
#Adipurush
#Balagam
Satya Pal Malik
#KisiKaBhaiKisiJaan
Show more
I love my new blue tick! I had previously requested again and again, but 20k followers and unique content weren't good enough for them. Of course being a Zionist booted me way down the list. Now I can post longer videos, longer tweets, and have some editing ability, not to...
Lots of love from India
Replying to @elonmusk
Tweet your reply
Reply

In this UI fig 2.3 select the tweet from the person we have searched and selecting the top most tweet of that interface, after selecting the tweet like and comment automatically

Fig 2.4

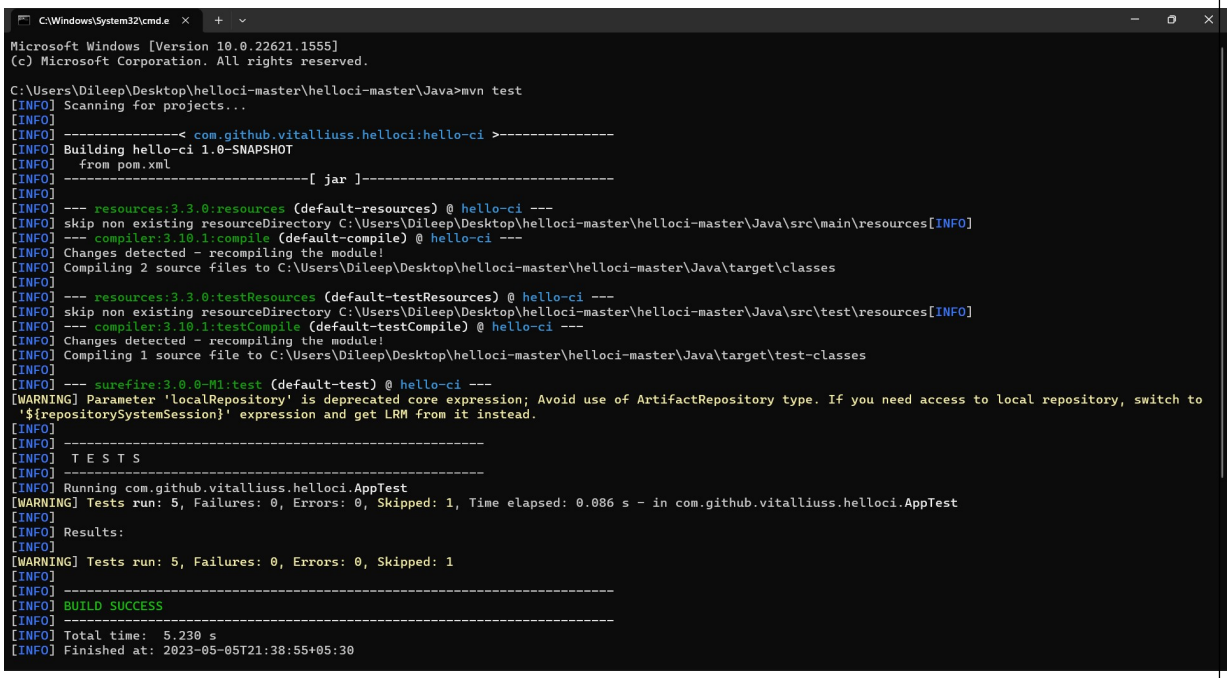


The above fig2.5 shows us that by selecting user account followed by logout button.

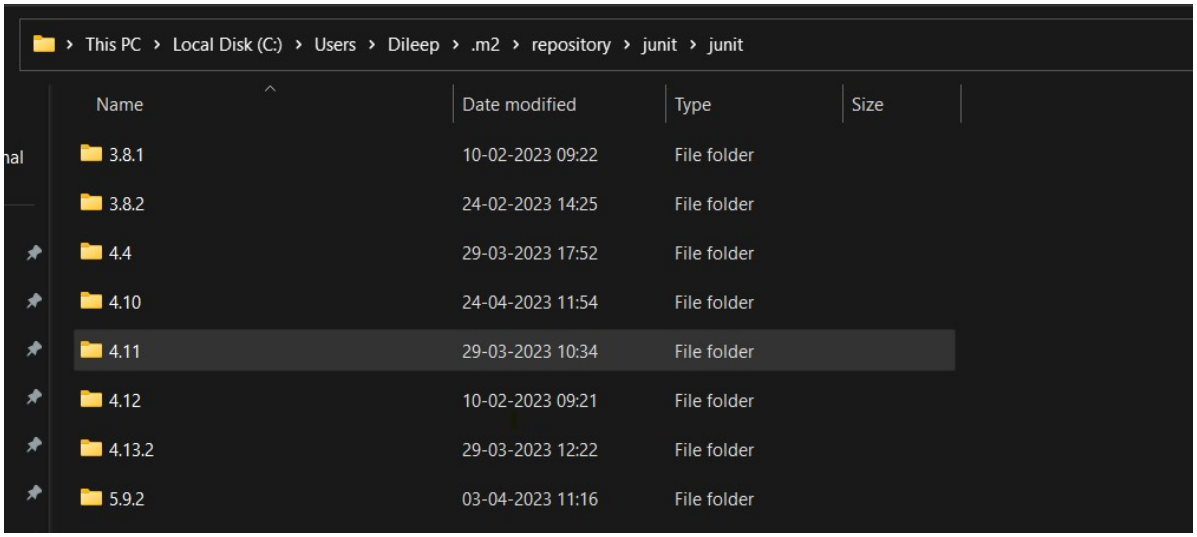
This will automatically logout from the website.

2.2-Individual Task

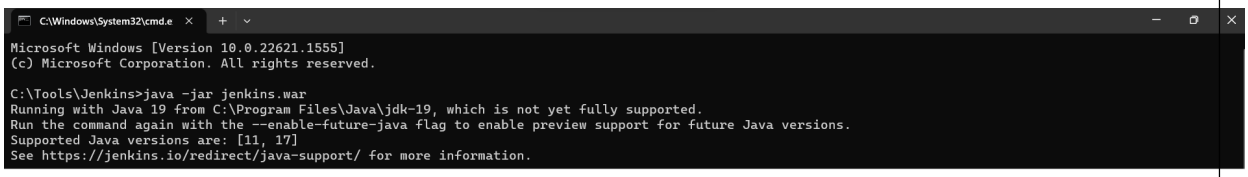
checking whether maven is present in the system or not

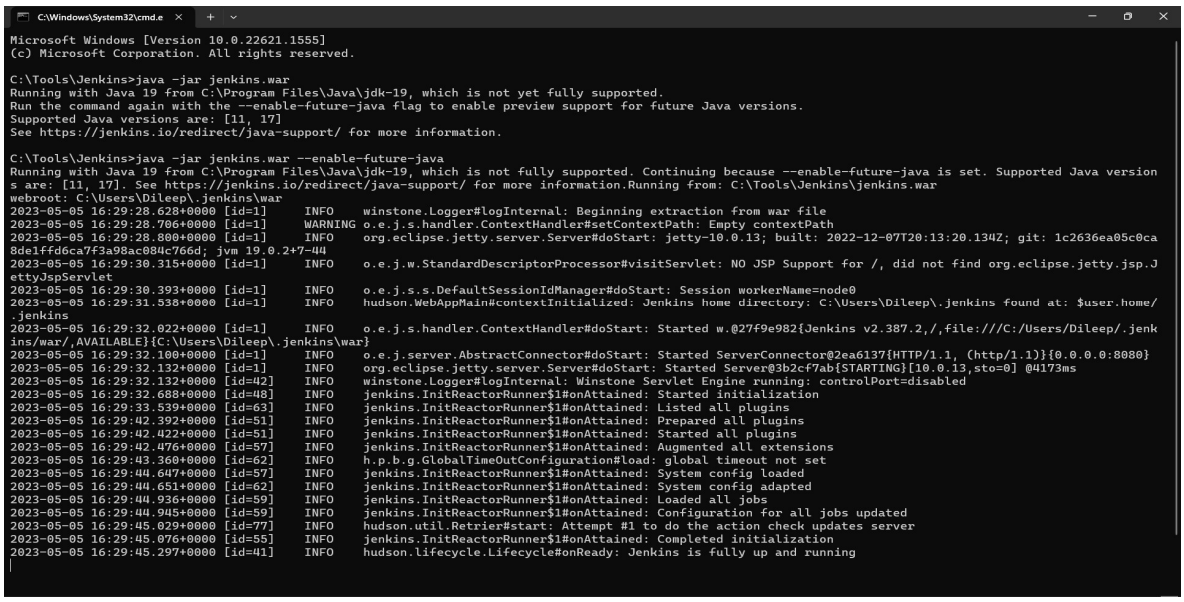


After adding some parameters to the given GitHub link it was build success by using maven test



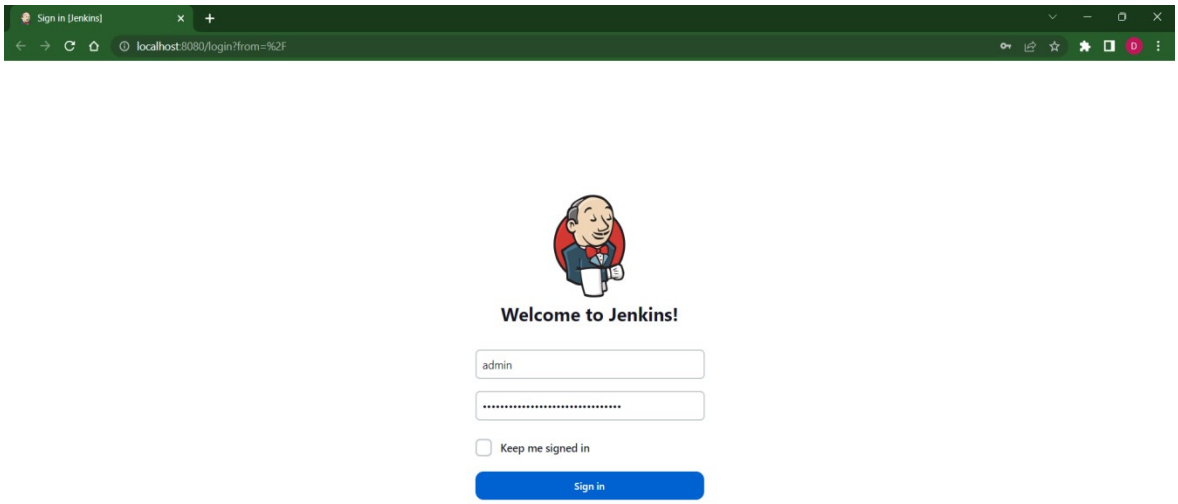
the junit version in the file pom.xml from 4.12 to 4.11. Make sure the new version of the library has been added to .m2 / repository





Start running the jenkins to obtain a connection with the local host by using the command

Jenkins.war --enable-future



By connecting to the local host we cang go to the dashboard and put the given url in the specified box

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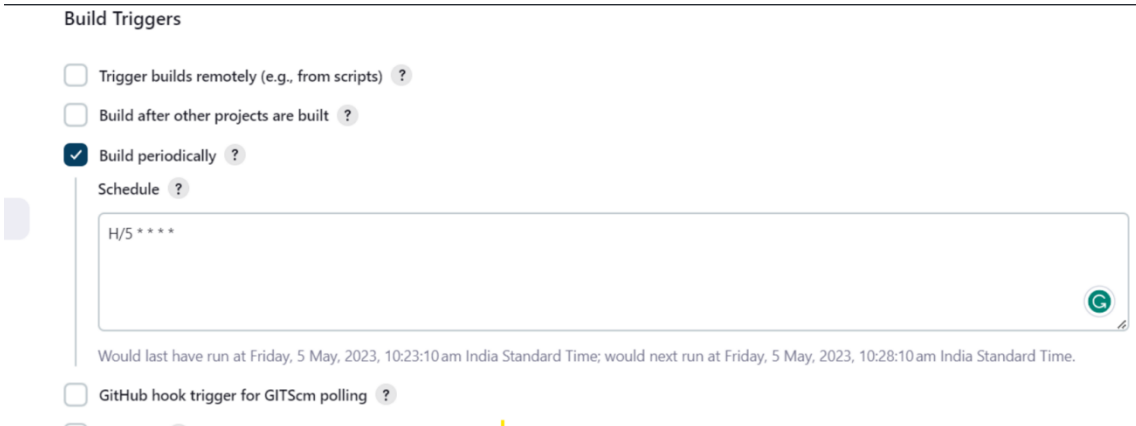
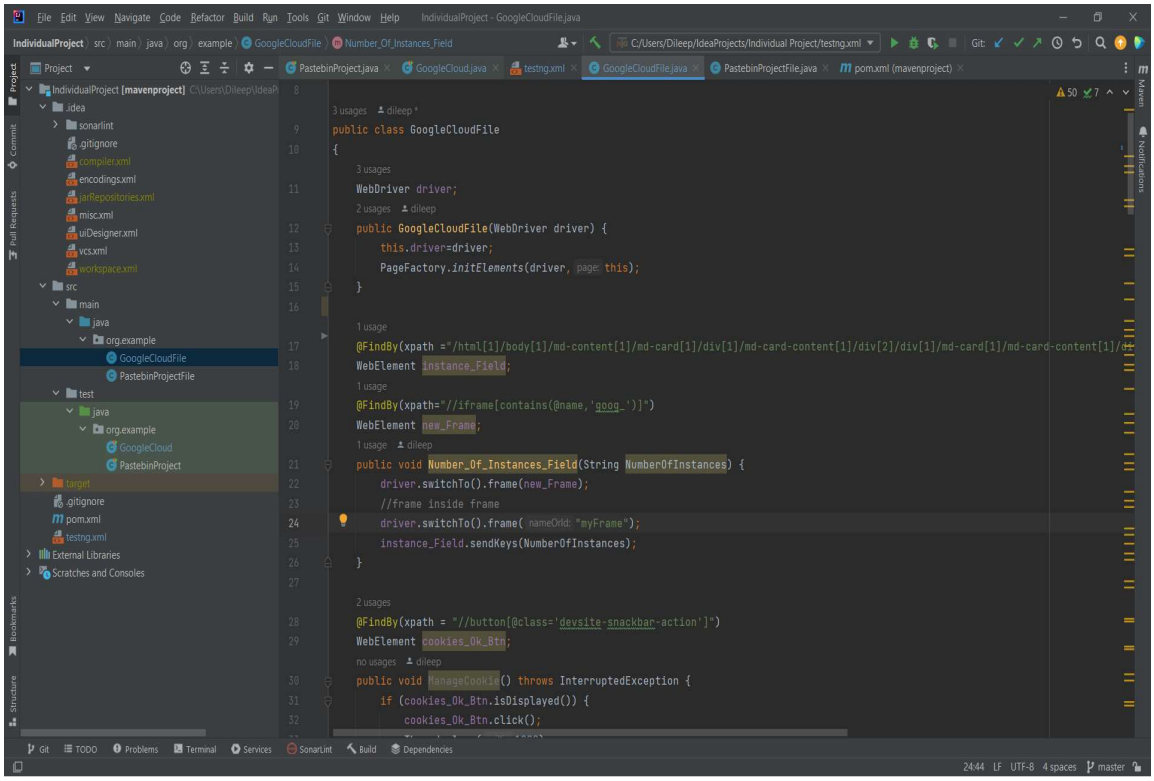
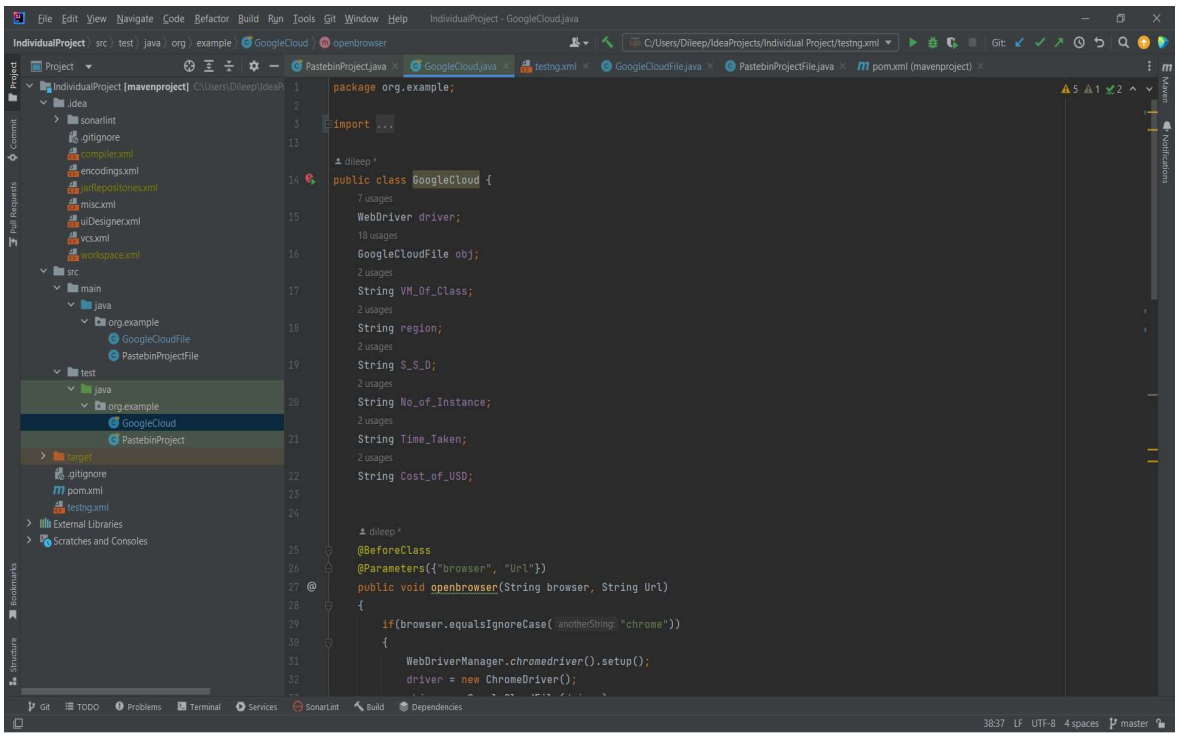


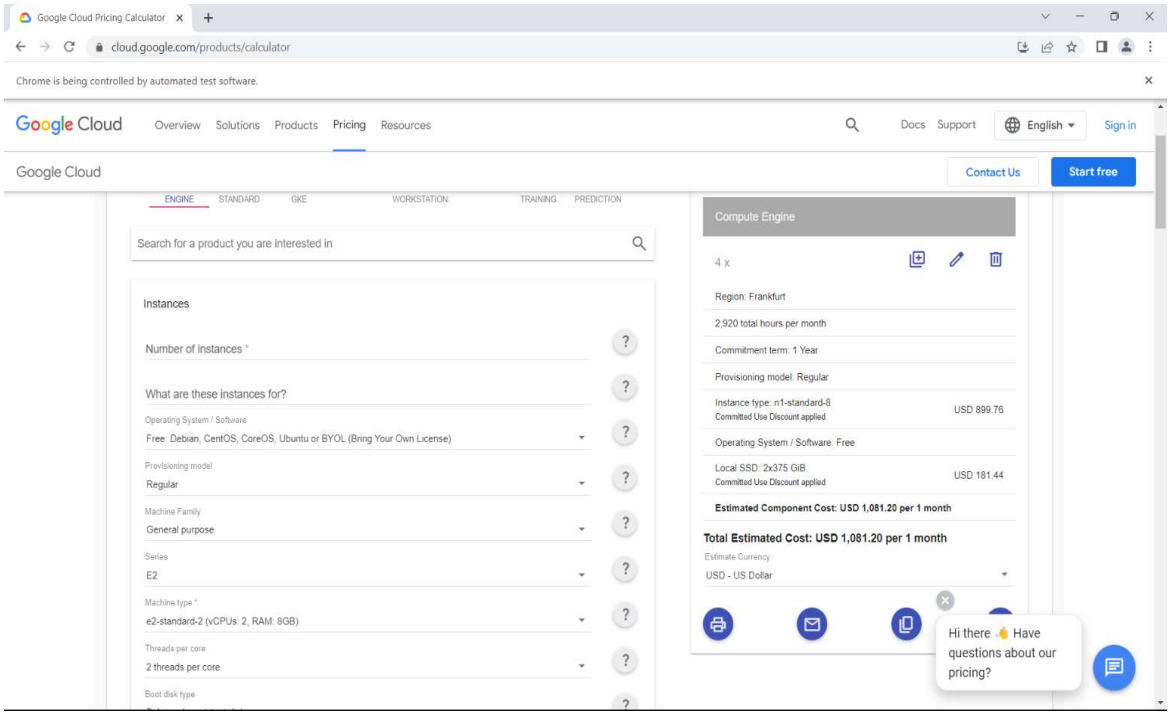
Setup the build triggers, so that task is performed for every 5 minutes



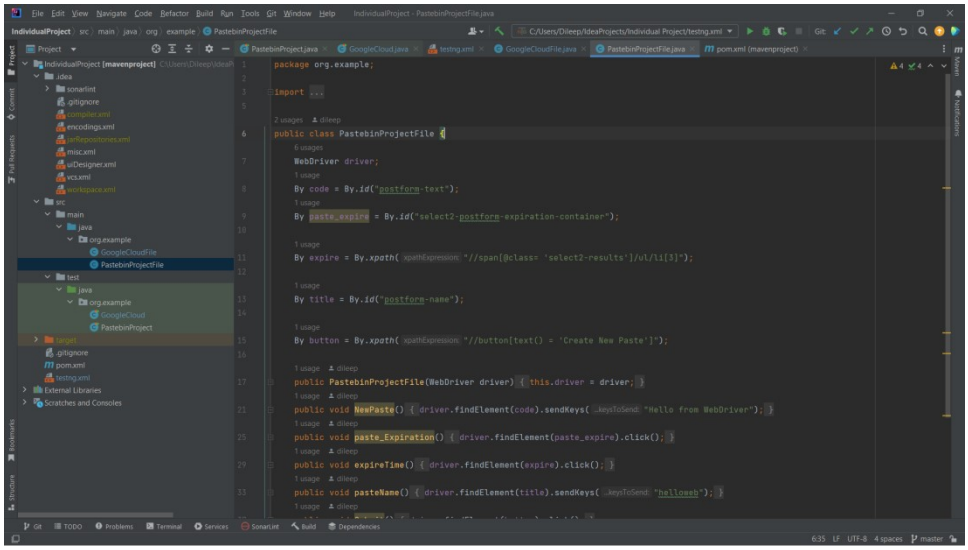
In the above figure contains the properties of Google Cloud individual task in the java file



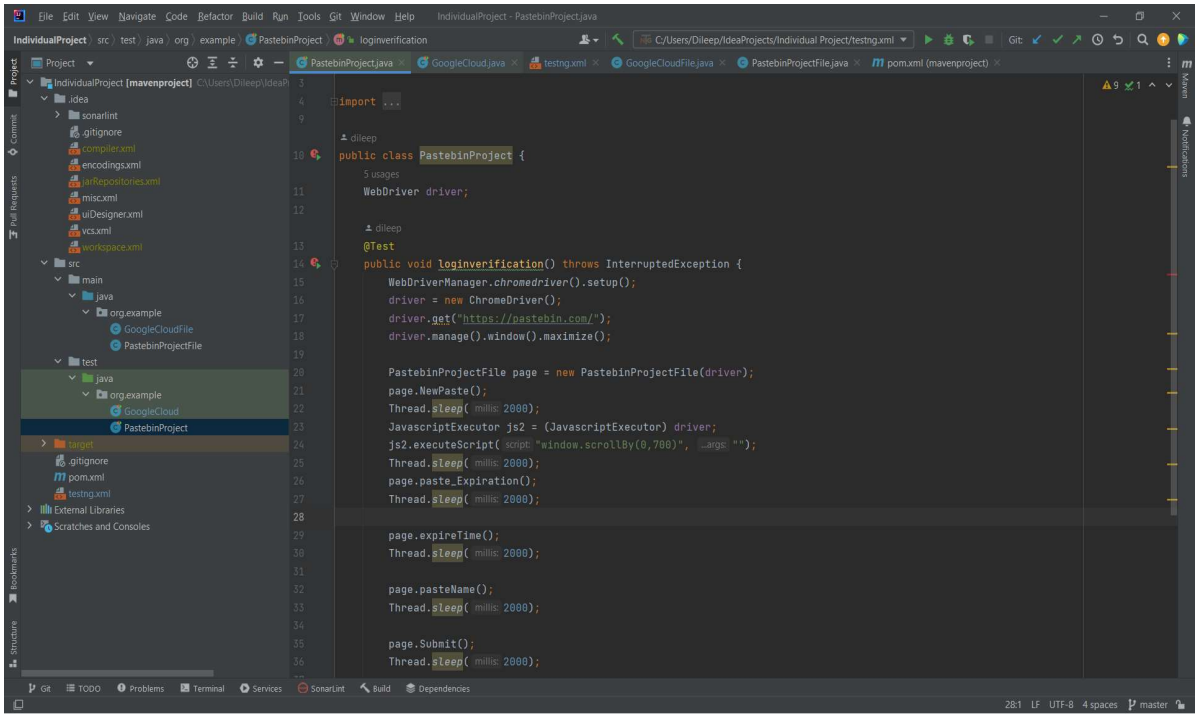
This is the Google Cloud test file, so it can access the java file and run the tests with the set of actions mentioned in the given code



These are the results of Google Cloud file after running from testing xml file, in this xml file we can do the parallel testing like after completing execution of the specific browser it will followed by executing in the other browser

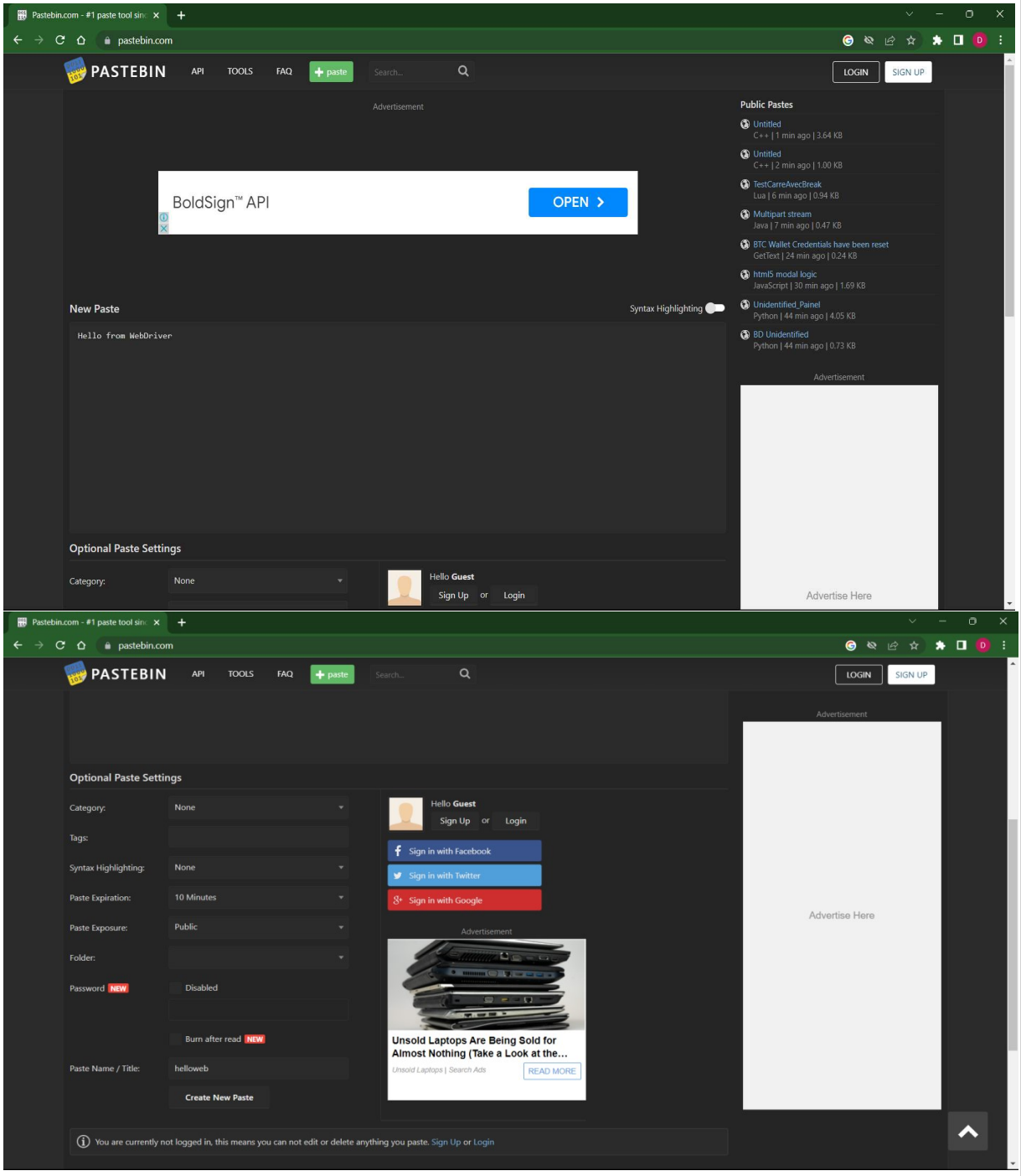


Pastebin individual task java file



```
import ...

dileep
public class PastebinProject {
    5 usages
    WebDriver driver;

    dileep
    @Test
    public void loginverification() throws InterruptedException {
        WebDriverManager.chromedriver().setup();
        driver = new ChromeDriver();
        driver.get("https://pastebin.com/");
        driver.manage().window().maximize();

        PastebinProjectFile page = new PastebinProjectFile(driver);
        page.NewPaste();
        Thread.sleep( millis: 2000);
        JavascriptExecutor js2 = (JavascriptExecutor) driver;
        js2.executeScript( script: "window.scrollBy(0,700)", ...args: "");
        Thread.sleep( millis: 2000);
        page.paste_Expiration();
        Thread.sleep( millis: 2000);

        page.expireTime();
        Thread.sleep( millis: 2000);

        page.pasteName();
        Thread.sleep( millis: 2000);

        page.Submit();
        Thread.sleep( millis: 2000);
```

Pastebin individual test file, compile and run to perform tasks such as entering test and selecting the various options given in the specific task



These are the above results after running the Pastebin test file in the intellij

Chapter-3

TECHNOLOGIES LEARNT DURING INTERNSHIP

Git:

Git is a free and open-source distributed version control system that was first developed by Linus Torvalds in 2005. It is designed to help developers manage and track changes to their codebase, enabling collaboration with other developers, managing different versions of the code, and rolling back changes when necessary.

Here are some key features and benefits of Git:

1. Distributed version control: Git uses a distributed model, which means that every developer has a local copy of the entire codebase. This enables developers to work independently and make changes to the codebase without disrupting the work of others.

2. Branching and merging: Git allows developers to create branches, which are separate copies of the codebase that can be worked on independently. Branches can be merged back into the main codebase when the work is complete.

3. Code history: Git keeps track of every change made to the codebase, creating a detailed history of the code. Developers can use Git to view the history of the code, including who made changes, when the changes were made, and why.

4. Collaboration: Git makes it easy for developers to collaborate on code by enabling them to share changes with others and merge changes from different developers into the main codebase.

5. Security: Git provides several security features, such as the ability to sign commits with GPG keys, which helps to ensure that code changes are made by trusted developers.

6. Integration: Git integrates with a wide range of tools and services, such as GitHub, GitLab, and Bitbucket, making it easy to manage code changes in a variety of different environments.

Overall, Git has become an essential tool for developers, providing an efficient and effective way to manage code changes, collaborate with other developers, and maintain code quality. As Git continues to evolve, we can expect to see further updates and improvements to the platform, enabling developers to work even more effectively and efficiently.

Java

Java is a popular and versatile programming language that was first released by Sun Microsystems in 1995. It has since become one of the most widely used programming languages in the world, with a large and active community of developers. Here are some key features and benefits of Java:

1. Platform independence: One of the main benefits of Java is its platform independence, which means that Java code can be run on any platform that has a Java Virtual Machine (JVM) installed. This makes it easier for developers to write code that can be run on multiple platforms, including Windows, macOS, and Linux.

2. Object-oriented programming: Java is an object-oriented programming language, which means that it supports concepts such as inheritance, polymorphism, and encapsulation. These concepts make it easier to write code that is reusable, maintainable, and scalable.

3. Garbage collection: Java includes an automatic garbage collector, which helps to manage memory and reduce the risk of memory leaks and other memory-related errors.

4. Large standard library: Java includes a large standard library, which provides developers with a wide range of pre-built classes and functions that can be used to build applications more quickly and efficiently.

5. Community support: Java has a large and active community of developers, which provides access to a wide range of resources and tools, including forums, tutorials, and open-source libraries.

6. Security: Java includes built-in security features, such as a security manager and a sandbox environment, which help to protect against security threats such as viruses and malware.

7. Mobile app development: Java is widely used for mobile app development, particularly for Android apps. The Android Studio development environment provides extensive support for Java development, making it easier for developers to build high-quality mobile apps.

Overall, Java is a powerful and versatile programming language that continues to be widely used in a range of applications, from web development to mobile app development to enterprise software development. As Java continues to evolve, we can expect to see further updates and improvements to the language and its associated tools and frameworks.

Maven

Maven is a popular build automation tool used in the Java development community. It provides a simple and efficient way to manage project dependencies, build configurations, and deployment processes. Here are some of the key features and benefits of Maven in more detail:

1. Dependency Management:

Maven is widely used for managing project dependencies. By defining dependencies in the project's pom.xml file, Maven can automatically download the required libraries and dependencies from the central Maven repository or other configured repositories. This simplifies the development process by reducing the need for manual configuration and management of dependencies.

2. Build Automation:

Maven provides a simple and efficient way to automate the build process for a project. By defining a set of build goals and tasks in the pom.xml file, Maven can automate the build process for tasks such as compiling code, running tests, generating documentation, packaging, and more. This automation helps to save time and reduce errors in the build process.

3. Consistent Builds:

Maven provides a standardized project structure and build process, which helps to ensure that builds are consistent and repeatable across different development environments and machines. This helps to ensure that the final product is consistent and reliable.

4. Plugin Ecosystem:

Maven has a large and active plugin ecosystem, which provides a wide range of plugins for tasks such as code analysis, testing, deployment, and more. These plugins can be easily integrated into the build process using the pom.xml configuration file. This makes it easy to customize the build process to meet the specific needs of the project.

5. Easy Integration with IDEs: Maven can be easily integrated with popular IDEs such as Eclipse and IntelliJ IDEA, making it easy to manage and build projects within the IDE. This

helps to streamline the development process by providing an integrated environment for developing, testing, and debugging code.

6. Central Repository:

Maven includes a central repository, which provides a large and comprehensive collection of libraries and dependencies that can be easily accessed and managed by developers. This helps to reduce the time and effort required to find and manage dependencies for a project.

7. Deployment Management:

Maven provides tools and plugins for managing the deployment of a project, including deploying to a local repository, a remote repository, or a production server. This helps to simplify the deployment process and reduce the risk of errors and inconsistencies in the deployment process.

Overall, Maven is a powerful and flexible build automation tool that provides many benefits for Java developers. By using Maven to manage dependencies, automate the build process, and manage deployment, developers can save time and effort while ensuring that their projects are consistent, reliable, and scalable.

Selenium WebDriver

Selenium WebDriver is an open-source tool used for automating web browsers. It is a popular choice for web automation testing due to its simplicity, flexibility, and wide range of supported browsers and operating systems. Here are some key features and benefits of Selenium WebDriver:

1. Cross-browser compatibility:

WebDriver supports a wide range of browsers, including Chrome, Firefox, Safari, Internet Explorer, and Edge. This makes it a versatile tool for web automation testing, as developers and testers can choose the browser that best suits their needs. It also supports multiple operating systems, including Windows, macOS, and Linux.

2. Simple API:

WebDriver provides a simple and intuitive API, which makes it easy to write and execute test cases. The API is available in multiple programming languages, including Java, Python, C#, and Ruby. This allows developers and testers to choose the language that they are most comfortable with.

3. Robust object identification:

WebDriver uses a robust mechanism for identifying web page elements, which makes it less prone to errors and flakiness. It supports various identification strategies, such as ID, name, class, CSS selector, and XPath. This makes it easier to locate and interact with elements on the web page, even if the page structure or layout changes.

4. Flexibility:

WebDriver is highly flexible and can be used for various types of testing, such as functional testing, regression testing, and acceptance testing. It also supports different testing frameworks, such as TestNG and JUnit. This allows developers and testers to choose the testing approach that best suits their needs.

5. Parallel testing:

WebDriver supports parallel test execution, which allows for faster test execution and improved efficiency. This is achieved by distributing test cases across multiple threads, machines, or even cloud platforms. Parallel testing can help reduce the time and effort required for testing, while also improving test coverage and accuracy.

6. Integration with other tools:

WebDriver can be easily integrated with other tools, such as Maven, Jenkins, and Log4j, to automate the build process, manage dependencies, and log information and errors during the testing process. This makes it easier to incorporate WebDriver into an existing software development and testing workflow.

Overall, Selenium WebDriver is a powerful and versatile tool for web automation testing, which provides a range of features and benefits for developers and testers. By using WebDriver, developers can improve the quality and reliability of their software applications, while also reducing the time and effort required for manual testing.

TestNG

TestNG is a testing framework for Java that is designed to be more powerful and flexible than JUnit. It was inspired by NUnit, a similar testing framework for .NET. TestNG has become a popular choice for developers in the Java community for a number of reasons, including its flexibility, extensibility, and ease of use.

Here are some of the key features and benefits of TestNG:

1. Annotations: TestNG uses annotations to allow developers to mark their tests with metadata that can be used to control how they are executed. Annotations include @Test, @BeforeTest, @AfterTest, and many others. Annotations allow developers to specify preconditions and postconditions for test execution, control the order in which tests are executed, and provide additional metadata about tests.

2. Test groups: TestNG allows developers to group their tests into logical groups. This can be useful for running only a subset of tests during development or for executing tests that are related to a specific feature or functionality of an application.

3. Parameterization: TestNG supports parameterization of tests, which allows developers to run the same test with multiple sets of data. This can be useful for testing different scenarios without having to write multiple test cases.

4. Dependency testing: TestNG allows developers to specify dependencies between tests. This means that one test can depend on the successful execution of another test. This can be useful for testing workflows and processes that have multiple steps.

5. Test listeners: TestNG provides a number of listeners that can be used to perform additional actions before or after tests are executed. For example, a test listener can be used to start and stop a server before and after tests are run.

6. Data providers: TestNG allows developers to specify data providers, which are methods that provide test data to a test method. This can be useful for testing complex scenarios that require large amounts of test data.

7. Integration with build tools: TestNG can be easily integrated with build tools like Maven and Gradle, which makes it easy to run tests as part of a build process.

8. Test reports: TestNG generates HTML reports that provide detailed information about test execution, including the number of tests run, the number of tests passed and failed, and the time taken to execute tests.

In summary, TestNG is a powerful and flexible testing framework for Java that provides a number of features and benefits to developers. TestNG allows developers to write tests that are easier to maintain, faster to execute, and provide better coverage of the application being tested. TestNG's flexibility, ease of use, and integration with build tools make it a popular choice for developers in the Java community.

Junit

JUnit is a widely-used open-source testing framework for Java programming language. It provides a simple and efficient way to write and execute unit tests for Java code, which helps developers to ensure that their code is correct, robust and maintainable.

Here are some of the key features and benefits of JUnit:

1. Simple API: JUnit provides a simple and intuitive API, which makes it easy to write and execute unit tests. The API includes a set of annotations and assertions, which developers can use to define test cases and verify the expected behavior of their code. For example, the @Test annotation is used to define a test case, while assertions such as assertEquals() and assertTrue() are used to check the results of the test.

2. Test fixtures: JUnit supports the concept of test fixtures, which allows developers to define the setup and teardown code for their tests. A test fixture is a set of preconditions that must be met before a test can be executed, and postconditions that must be met after the test has completed. This can help reduce code duplication and ensure that each test case is executed in a clean and consistent environment.

3. Test suites: JUnit allows developers to group their test cases into test suites, which makes it easier to organize and execute tests. Test suites can be used to run a subset of tests, or to run

multiple test classes as a single unit. This can help improve test coverage and reduce the time and effort required for testing.

4. Parameterized tests: JUnit supports parameterized tests, which allows developers to define a single test case that can be executed with multiple sets of input data. This can help reduce code duplication and improve test coverage, as developers can test different combinations of input data with a single test case.

5. Integration with IDEs: JUnit can be easily integrated with popular Java IDEs, such as Eclipse, IntelliJ IDEA, and NetBeans. This allows developers to write, execute and debug their tests within the IDE, which can help improve productivity and reduce errors.

6. Integration with build tools: JUnit can be easily integrated with popular Java build tools, such as Maven and Gradle. This allows developers to automate the execution of their tests as part of the build process, which can help improve the quality and reliability of their code.

In summary, JUnit is a powerful and versatile testing framework for Java, which provides a range of features and benefits for developers. By using JUnit, developers can improve the quality and reliability of their code, while also reducing the time and effort required for manual testing.

Jenkins

Sure, here is a more detailed report on Jenkins:

Introduction:

Jenkins is a free and open-source automation server that is used to automate various aspects of software development, such as building, testing, and deploying software. Jenkins was

originally created as a fork of the Hudson project, and has since become one of the most widely used automation servers in the industry. Jenkins is known for its extensibility, flexibility, and ease of use, and has a large and active community of users and contributors.

Features:

Jenkins provides a wide range of features for automating software development workflows, including:

1. Continuous Integration: Jenkins is primarily used for continuous integration, which is the practice of merging code changes into a shared repository frequently. Jenkins can automatically build and test code changes, which allows developers to catch and fix issues early in the development process.

2. Plugins: Jenkins has a vast array of plugins that can be used to extend its functionality. Plugins can be used to integrate Jenkins with other tools, such as version control systems, issue trackers, and build tools.

3. Distributed Builds: Jenkins can distribute build and test jobs across multiple machines, which allows developers to scale their builds and tests as needed. Jenkins can also dynamically allocate build and test resources based on the availability of machines.

4. Pipeline as Code: Jenkins supports pipeline as code, which allows developers to define their build and test pipelines using code, instead of a graphical user interface. This approach allows pipelines to be version-controlled and shared with others.

5. Notifications: Jenkins can send notifications when a build fails or succeeds, which can be useful for keeping developers informed about the status of the build.

6. Security: Jenkins provides security features, such as authentication and authorization, which allows developers to control who has access to Jenkins and what they can do. Jenkins also supports integration with external authentication providers, such as LDAP and Active Directory.

7. Easy Installation: Jenkins is easy to install and can be run on a variety of operating systems and environments, such as Windows, Linux, and macOS. Jenkins can also be installed in a Docker container, which makes it easy to deploy and manage.

8. Community Support: Jenkins has a large and active community of users and contributors, which provides support, documentation, and plugins for the tool. Jenkins also has a large number of third-party integrations and plugins available, which allows it to be integrated with many different tools and platforms.

Benefits:

Jenkins provides many benefits for software development teams, including:

1. Faster Feedback: Jenkins can automatically build and test code changes, which allows developers to get feedback on their changes quickly. This can help reduce the time it takes to find and fix issues in the code.

2. Improved Quality: By automatically building and testing code changes, Jenkins can help improve the quality of the code. Jenkins can also enforce coding standards and run static code analysis tools, which can help catch issues early in the development process.

3. Increased Efficiency: Jenkins can automate many aspects of the software development workflow, which can help increase the efficiency of the development process. This can allow developers to spend more time writing code and less time on manual tasks.

4. Scalability: Jenkins can distribute build and test jobs across multiple machines, which allows developers to scale their builds and tests as needed. This can help reduce the time it takes to build and test large codebases.

5. Flexibility: Jenkins can be customized and extended using plugins and pipeline as code. This allows developers to tailor Jenkins to their specific needs and integrate it with other tools and platforms.

Jenkins is a powerful automation server that provides a wide range of features and benefits for automating software development workflows. Jenkins is known for its extensibility, flexibility, and ease of use, and is widely used in the industry to automate software development

Chapter-4

Conclusion

All these learnings with my prior knowledge of Java/C++ made me suitable to work on a live project and contribute to the organization.

Though not much can be disclosed about the project, but the learnings sure can, so here are the things that I can conclude from my about 4 months of internship experience:

All the learnings till date were finally used while working on the live project.

No number of personal projects can replicate the experience of working on a live project.

As a fresher, every day was a new learning.

With each task assigned to me, it felt like a responsibility on our shoulders that had to be carried out diligently. Our wonderful team never led stress to develop, and the work was being carried out in a smooth, orderly manner.

Completing every assigned task before deadline gave me confidence to continue moving forward. Any hurdles faced were looked upon and the optimum way was paved for us.

Work-Life balance was always taken in consideration.

Also, during the time of my Internship I learnt that what you learnt in college are helpful but not sufficient, so you must acquire new and improved skills and how to apply them to solve the problems in work and in life as well.

Chapter-5

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