

Automation Tester

EPAM

A Training Report

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

**Bachelor of Technology
Computer Science and Engineering
(Testing Automation)**

**LOVELY PROFESSIONAL UNIVERSITY
PHAGWARA, PUNJAB**



From 13/01/2023 to 28/04/2023

SUBMITTED BY

Name of the student: Sushma Badhan

Registration Number: 11907809

Signature of the student: Sushma

SUBMITTED TO

Name of supervisor: Sakshi

Designation:

Signature of the supervisor:

Student Declaration

To whom so ever it may concern

I, Sushma, hereby declare that the work done by me on

"Testing Automation Training" from 13th Jan-2023 to 28th April-2023, under the 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)

Sushma Badhan, (11907809)

Sushma

Signature of the student Dated: 28/04/2023

Declaration by the supervisors

To whom so ever it may concern

This is to certify that Sushma, (11907809) from Lovely Professional University, Phagwara, Punjab, have worked as a trainee in **EPAM** on "**Testing Automation**" under my supervision from 13th **Jan 2023 to 28th April 2023**. 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 Internal Supervisor

Sakshi (Assistant Professor)

Dated: 28/04/2023

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Undertaking by the student for submitting Final Certificate of six months Internship

Reg No.,11907809

Student Name: Sushma Badhan

Program Name: B Tech, CSE

Batch Year: 2019-2023

Course Code: CSE441

Mobile No:6284738910

I understand that I have been provisionally allowed to appear for the ETP viva and We hereby declare that since we on 6 months Internship, thus I shall submit my final certificate of 6 months Internship to university after completion of my Internship but not later than Feb 2023.

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

CHAPTER!

INTRODUCTION TO COMPANY

1.1 About Epam Systems India Private Limited

EPAM Systems India Private Limited is a software development firm that is part of the EPAM Systems global network. EPAM was started in 1993 and has since evolved into one of the world's leading providers of software engineering services and solutions. The company's headquarters are in Newtown, Pennsylvania, and it has development centers throughout Europe, Asia, and the Americas.

EPAM's India operations were founded in 2004 with the goal of offering high-quality software development services to clients across multiple industries. EPAM India now has a substantial presence in the country, with distribution centers in Bangalore, Hyderabad, Pune, and Kolkata, as well as over 12,000 personnel working in these locations. The company places a significant emphasis on innovation and uses cutting-edge technologies and development techniques to give cutting-edge solutions to its clients.

Product engineering, custom software development, application development, testing and QA, UX/UI design, and digital transformation are all services provided by EPAM India. The company specializes in a variety of technologies, including cloud computing, data analytics, mobility, and IoT.

Overall, EPAM Systems India Private Limited is a trustworthy partner for companies looking to harness technology to reach their objectives. The company's strong emphasis on innovation, quality, and customer satisfaction makes it a reliable choice for clients all over the world.



Sandeep Joshi

Head of Technology & Delivery



John Carmody

Head of Sales



Jim Warburton

Head of Consulting

Company's Vision and Mission

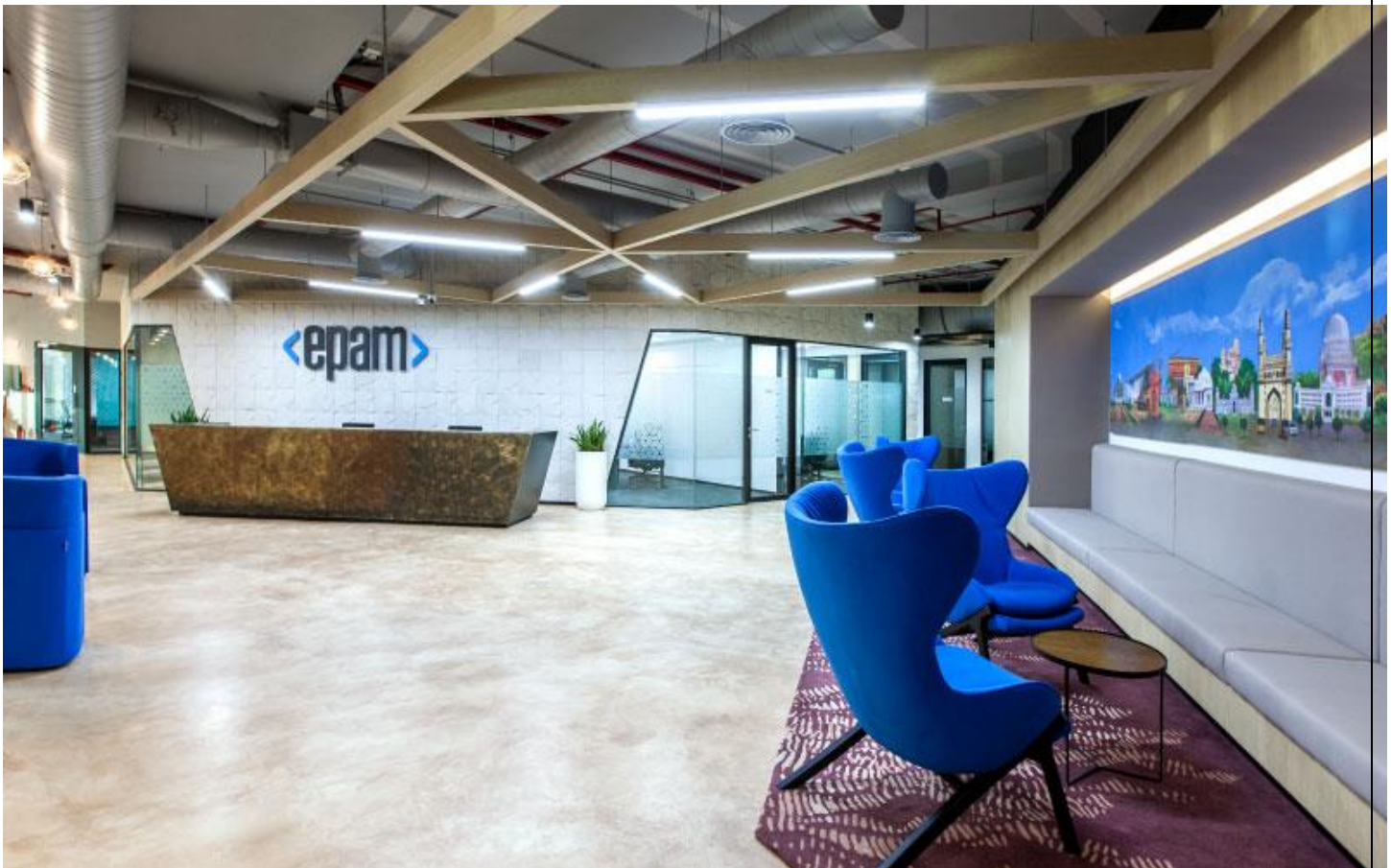
EPAM Systems India Private Limited's vision is to become the go-to partner for companies looking to use technology to promote innovation and growth.

EPAM Systems India Private Limited's mission is to provide world-class software engineering services and solutions to clients in order to help them achieve their business objectives. The company plans to accomplish this by:

- **Attracting and Maintaining Top Talent:** - EPAM India seeks to establish a work environment that supports creativity, innovation, and professional progress for its workers in order to attract and retain the best talent.
- **Investing in cutting-edge technologies:** The company is committed to remaining at the cutting-edge of

technical innovation, investing in cutting-edge tools and procedures to provide high-quality solutions to its clients.

- **Emphasizing customer satisfaction:** Client satisfaction is important to EPAM India, and the company strives to develop long-term relationships with its clients by delivering solutions that meet or exceed their expectations.
- **Fostering an excellence culture:** The organization promotes a culture of continuous learning, improvement, and excellence, with the goal of becoming a thought leader in the software engineering industry.
- **Giving back to the community:** EPAM India is dedicated to giving back to the community and supports a variety of social and environmental programs that have a beneficial impact on society.



Company Core Values:

1. **Customer satisfaction:** The organisation prioritises its clients' needs and works hard to deliver solutions that exceed their expectations.
2. **Excellence:** EPAM India strives for excellence in all aspects of its operations, from the quality of its solutions to the professionalism of its staff.
3. **Innovation:** Creativity and innovation are valued by the organisation, which encourages its staff to think outside the box and come up with new and better methods of doing things.
4. **Responsibility:** EPAM India accepts responsibility for its actions and is dedicated to ethical and responsible business practices.
5. **Collaboration:** The company believes in the potential of cooperation and teamwork, both internally and with clients and partners.
6. **Professionalism:** EPAM India places a premium on professionalism in all parts of its operations, from staff behavior to solution delivery.
7. **Social responsibility:** The company is dedicated to making a positive difference in society and the environment, and it supports a variety of social and environmental activities.



WE'RE HIRING

ENGINEER YOUR FUTURE

CAREER GROWTH.
NETWORKING.
UNIQUE BENEFITS.
REMOTE WORKING OPTION.

Origin and growth of company

EPAM Systems India Private Limited is a subsidiary of EPAM Systems Inc., a leading global provider of digital platform engineering and software development services. EPAM was founded in 1993 in Princeton, New Jersey, by Arkadiy Dobkin, a software engineer and entrepreneur.

It was established in 2004 with the aim of providing high-quality software engineering and IT consulting services to clients in India and around the world. The company started with a small team of engineers in Bangalore and has since grown to become one of the largest technology service providers in the country.

Over the years, EPAM Systems has expanded its service offerings and grown its client base across multiple industries, including finance, healthcare, retail, and media. The company has also established delivery centers in multiple locations across India, including Hyderabad, Pune, and Chennai, to better serve its clients.

The Company has received numerous awards and recognitions for its work in the technology industry, including being named a "Leader" in the Gartner Magic Quadrant for Application Services in 2020. The company's growth and success can be attributed to its focus on delivering innovative solutions, its commitment to client satisfaction, and its talented team of engineers and technology professionals.

Various departments and their functions

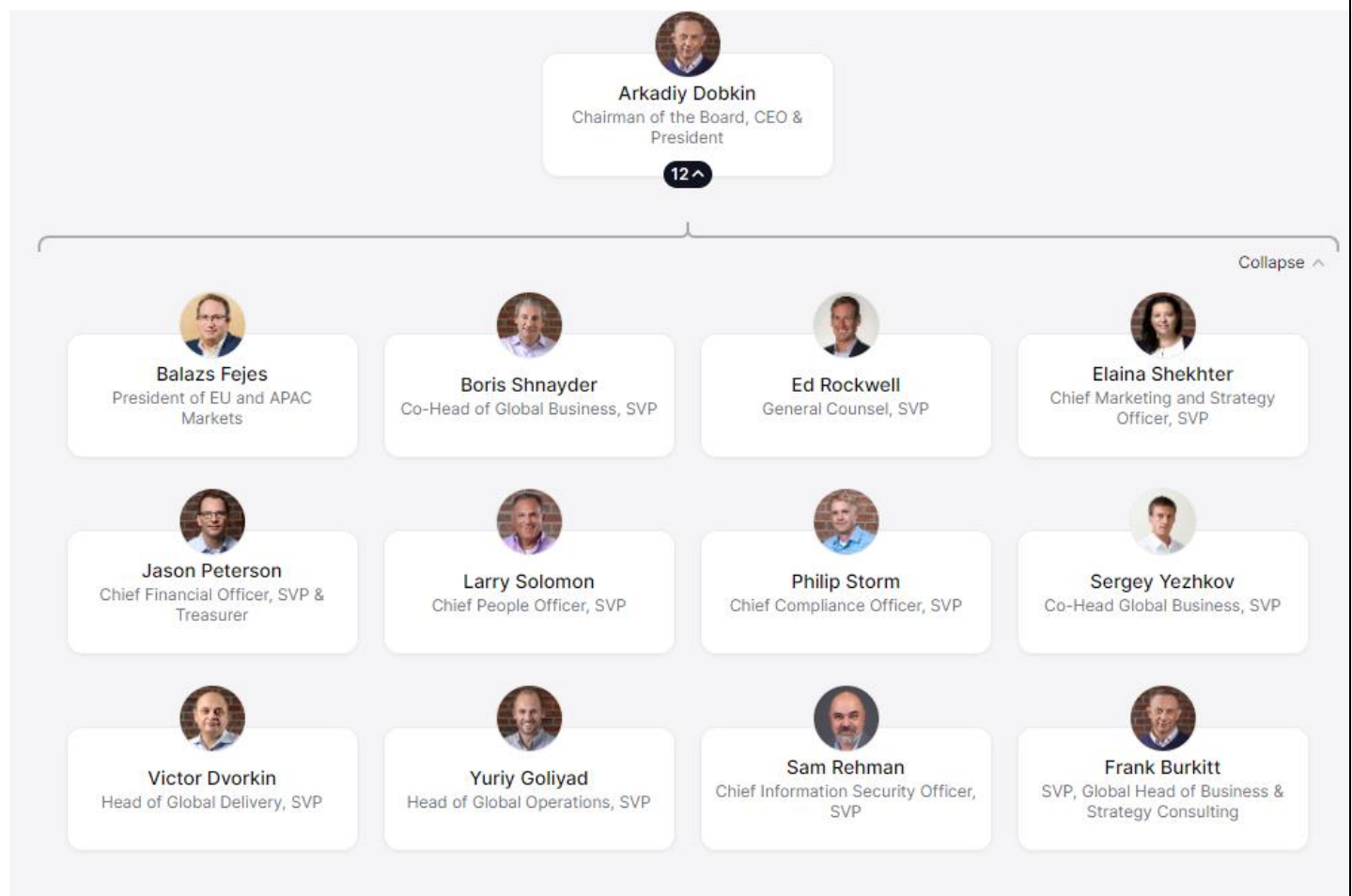
EPAM Systems India Private Limited is a leading provider of digital platform engineering and software development services. The company has several departments that work together to deliver high-quality services and solutions to clients. Some of the main departments and their functions are:

- **Delivery:** This department is responsible for delivering high-quality software solutions to clients on time and within budget. They work closely with clients to understand their requirements, develop project plans, and oversee project execution.
- **Engineering:** The engineering department is responsible for designing, developing, and testing software solutions. They use cutting-edge technologies and agile methodologies to create innovative and scalable solutions for clients.
- **Quality Assurance:** This department is responsible for ensuring the quality of the software developed by EPAM Systems India Private Limited. They perform rigorous testing to identify and resolve any bugs or issues before the software is deployed to production.
- **Operations:** The operations department is responsible for managing the infrastructure and systems used by EPAM Systems India Private Limited. They ensure that the company's systems are reliable, scalable, and secure.
- **Business Development:** This department is responsible for identifying new business opportunities and developing relationships with clients. They work closely with clients to understand their needs and develop solutions that meet their requirements.

- **Human Resources:** The human resources department is responsible for managing the company's workforce. They recruit, train, and develop employees, and ensure that the company's culture and values are maintained.
- **Finance:** The finance department is responsible for managing the company's financial operations. They manage budgets, financial planning, and accounting functions.

These departments work closely together to deliver high-quality solutions to clients and ensure the smooth functioning of the company's operations.

Organization chart of the company



CHAPTER2

INTRODUCTION TO PROJECT

Throughout the program, we learnt a variety of talents. Every ability we learn, or gain has a varied scope, and each skill is important in our life. The following are some of the abilities that we learned:

- Collaboration
- Problem Solving
- Coordination
- Interpersonal Skills
- Time Management

Training Undertaken:

The project's objective is to give users of Maven, Selenium WebDriver, and Jenkins practical knowledge and hands-on experience. For managing dependencies, automating tests, and continuous integration, these tools are frequently used in software development. Maven, WebDriver, Framework, and Continuous Integration with Jenkins make up the project's four modules. Each module has mandatory hands-on exercises that must be finished in order to become proficient in using the tools effectively. We will also automate the process of filling out a form on the Google Cloud Platform Pricing Calculator using Selenium WebDriver, framework unit testing, and Page Object ideas. This project will teach us how to simulate user activities and check that the desired outcomes are obtained in order to automate web application testing. Additionally, the procedure of establishing a new paste with the code "Hello from WebDriver," setting the paste expiration to "10 Minutes," and giving it the name or title "helloweb" will be automated as part of this project. We can replicate user actions and carry out the procedures required to create a new paste by utilising the Selenium WebDriver. The framework unit test will allow us to run our tests frequently and at any time, and the Page Object notion will assist us in writing modular, manageable test code.

Installing Maven is necessary for the Maven module, as is carrying out simple tasks like downloading a test project from Github and building it with Maven. The Selenium WebDriver and Page Object concepts must be used to automate two scripts for the WebDriver module. For the second script from the WebDriver module,

which includes the WebDriver manager, Page Object, Models, Property files, XML suites, and an option for running with Jenkins, the Framework module requires creating an automation framework. Installing Jenkins, making a task to copy the project, starting tests every five minutes, and showing the test results on a job chart are all required for the Continuous Integration module. Moreover, opening the Google Cloud website, looking for the pricing calculator, going to the calculator page, and completing the form with the provided information are the steps in the procedure. The data in the form fields will then be checked to make sure it is what is intended, and the monthly rent will be compared to a manually computed number.

Through this project, we hope to provide students with the abilities and information they need to use these tools effectively, which will enhance the speed and calibre of software development processes.

Objectives of the work undertaken:

The goals of this project are to give users of Maven, Selenium WebDriver, and Jenkins real knowledge and hands-on experience because these tools are frequently used in software development for continuous integration, managing dependencies, and automating testing. The project features four modules: Maven, WebDriver, Framework, and Continuous Integration using Jenkins. For each module, there are required hands-on tasks that must be finished in order to become proficient with utilising the tools properly. The project also aims to teach participants how to simulate user activities and automate web application testing by automating the process of filling out a form on the Google Cloud Platform Pricing Calculator using Selenium WebDriver, framework unit testing, and Page Object ideas.

The project will also use Selenium WebDriver, framework unit testing, and Page Object ideas to automatically create a new paste with the code "Hello from WebDriver," set the paste expiration to "10 Minutes," and give it the name or title "helloweb." The Page Object concept will aid in building modular, manageable test code, and the framework unit test will enable the tests to be performed frequently and at any time.

Installing Maven, performing basic operations like downloading a test project from GitHub and creating it using Maven, and automating two scripts for the WebDriver module using Selenium WebDriver and Page Object principles are all required for this project. The Framework module needs building an automated

framework using the WebDriver manager, Page Object, Models, Property files, XML suites, and an option for running with Jenkins for the second script from the WebDriver module. Installing Jenkins, creating a task to duplicate the project, initiating tests every five minutes, and displaying the test results on a job chart are all necessary for the Continuous Integration module.

The project's final step entails opening the Google Cloud website, looking for the pricing calculator, going to the calculator page, filling out the form with the necessary information, verifying that the data in the form fields is accurate, and comparing the monthly rent to a figure manually calculated.

Scope of the Work:

This project seeks to educate and train users of Maven, Selenium WebDriver, and Jenkins, which are frequently used tools in software development for continuous integration, dependency management, and test automation. The project comprises of four modules: Maven, WebDriver, Framework, and Continuous Integration with Jenkins, each of which includes necessary hands-on activities to build skill in properly using the tools.

The project will concentrate on using Selenium WebDriver, framework unit testing, and Page Object ideas to automate web application testing. By automating the process of filling out a form on the Google Cloud Platform Pricing Calculator, participants will learn how to replicate user activities and test for intended results. Using Selenium WebDriver, framework unit testing, and Page Object concepts, the project will also automate the procedures for establishing a new paste with code, setting the paste expiration, and giving it a title.

Installing Maven, carrying out elementary operations like downloading and creating a test project from GitHub, and automating two scripts for the WebDriver module using Selenium WebDriver and Page Object concepts are all required for this project. Participants must build an automated framework using the WebDriver manager, Page Object, Models, Property files, XML suites, and an option for executing with Jenkins for the second script from the WebDriver module in order to complete the Framework module. Installing Jenkins, making a task to replicate the project, starting tests every five minutes, and showing the test results on a job chart are all necessary for the Continuous Integration module. The project will be finished by entering the Google Cloud website, going to the pricing calculator page, filling out the form with the necessary data, checking the information, and contrasting the monthly rent with a manually calculated figure.

The project's overarching goal is to give students the abilities and knowledge needed to use these technologies efficiently, which will speed up and improve the quality of software development processes.

Role and Profile:

I have been working in this project as a Automation Tester Intern

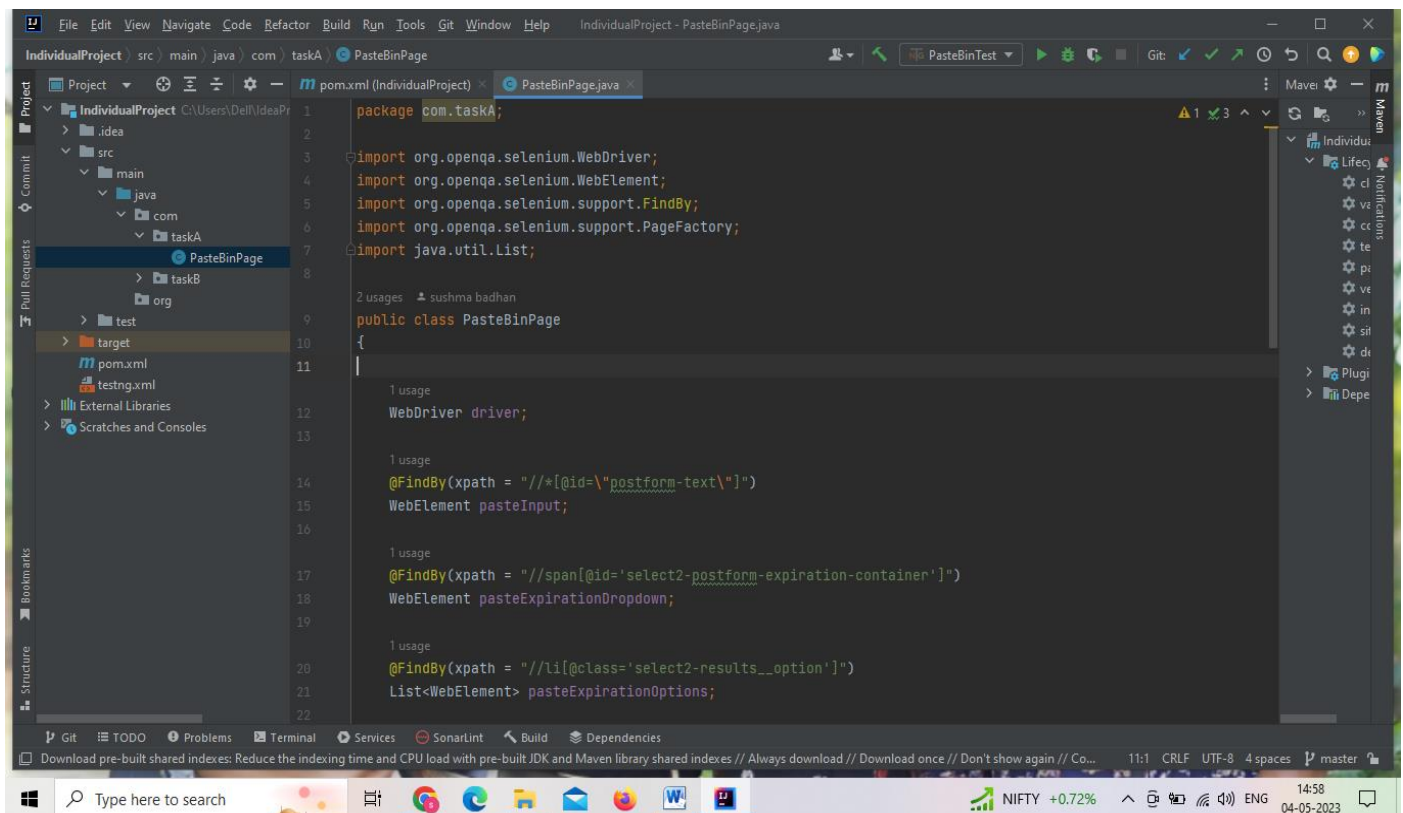
Roles and Responsibilities of a Automation Tester:

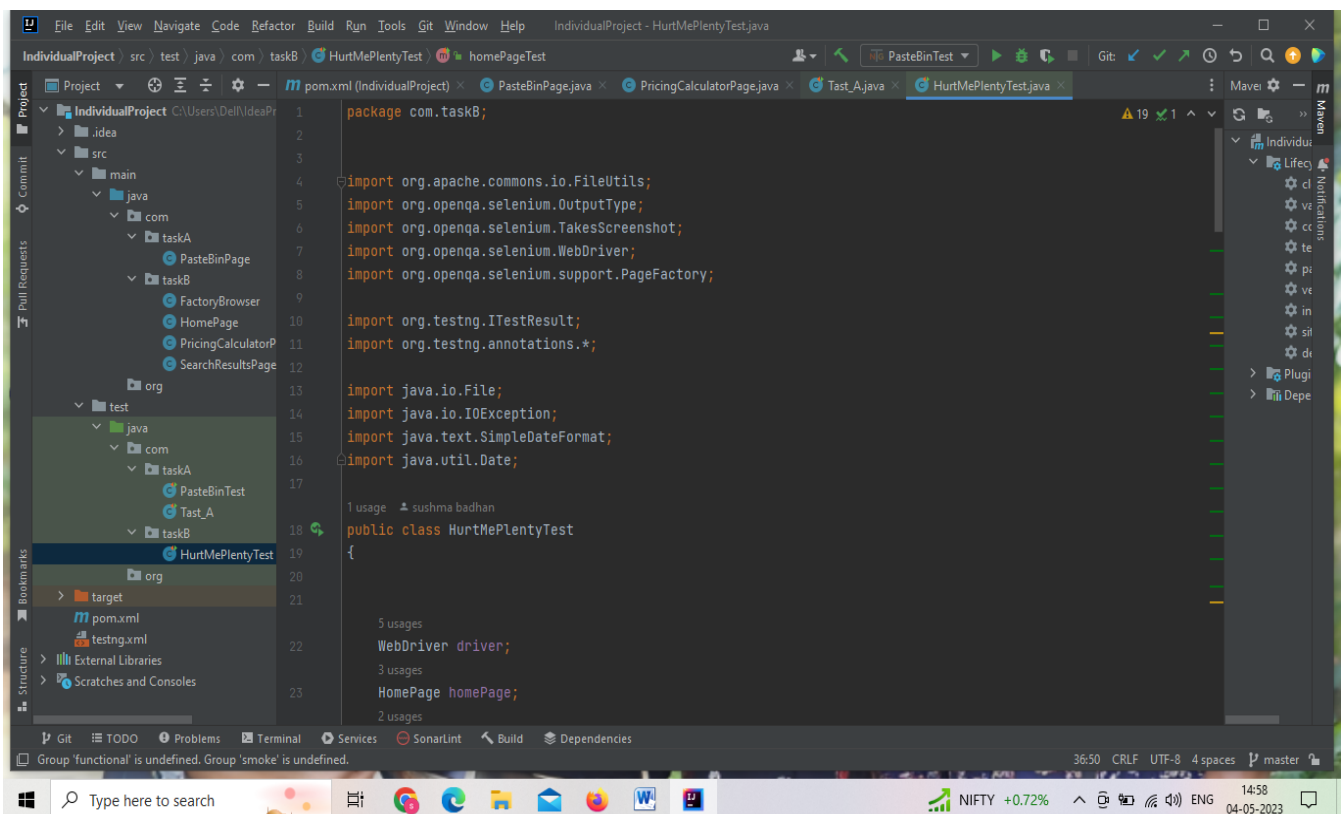
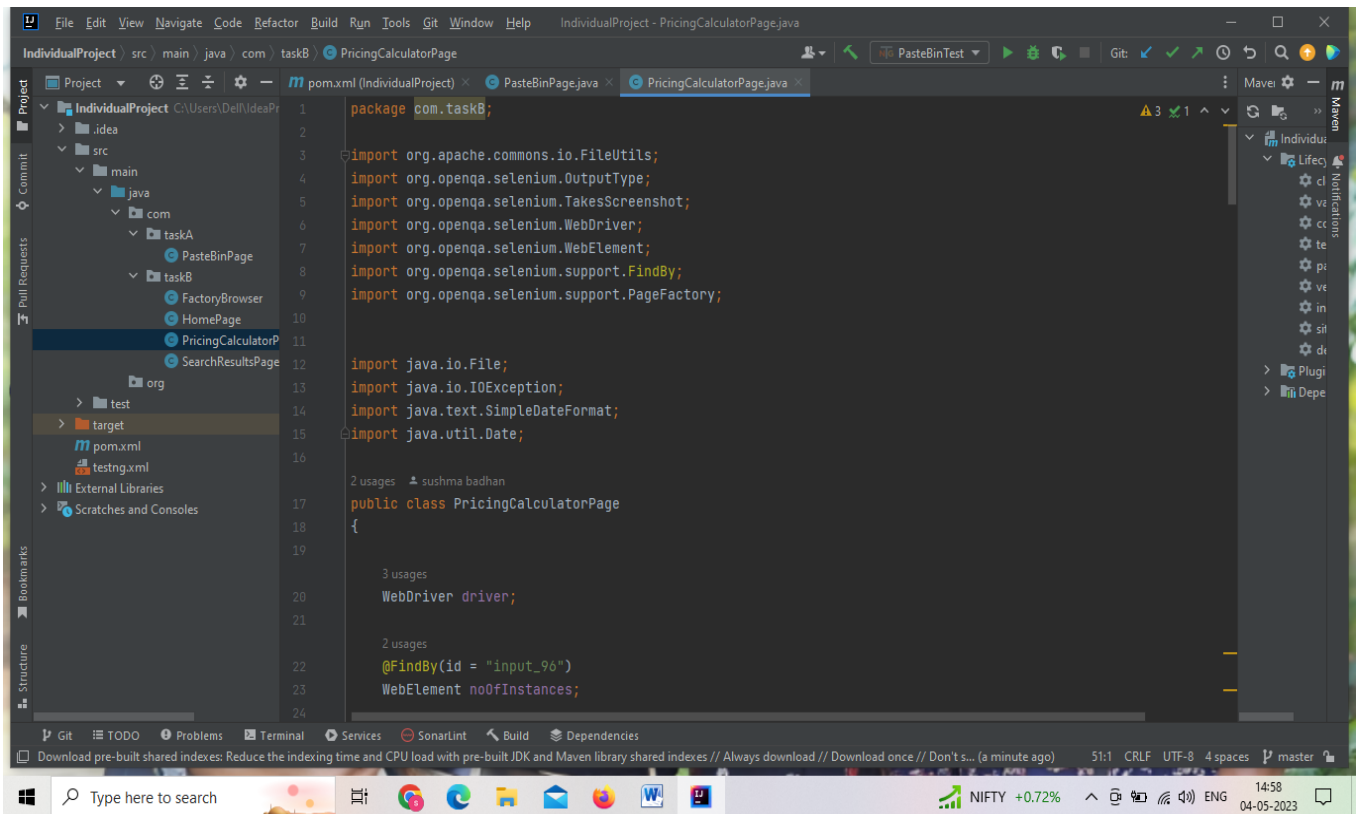
The roles and responsibilities of an Automation Tester can vary depending on the organization, but generally, they include:

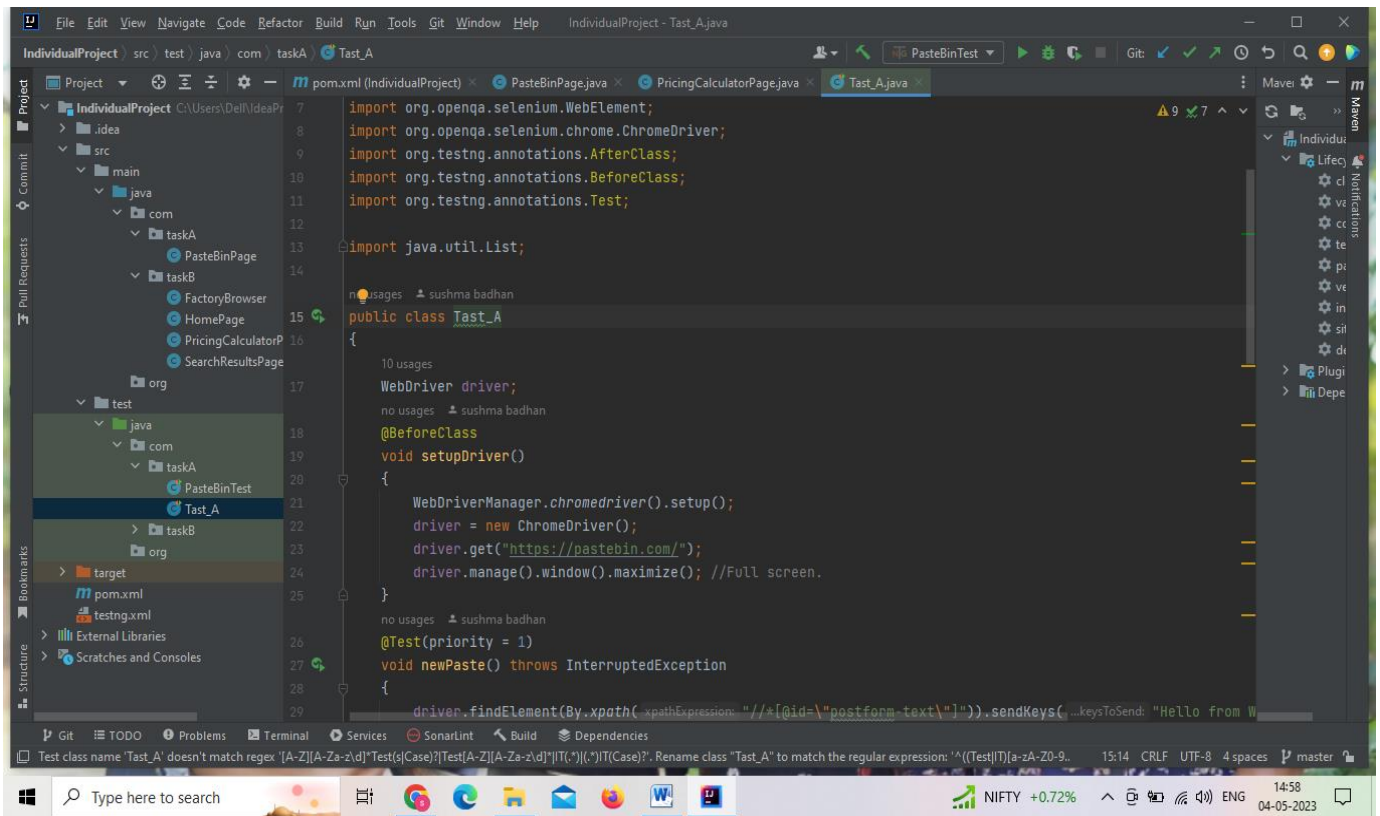
- **Designing and implementing automated testing frameworks:** Automation Testers are responsible for designing and implementing testing frameworks that can be used to automate various types of testing, including functional, performance, and security testing.
- **Developing and executing test cases:** Automation Testers develop test cases that can be used to verify the functionality of software applications. They also execute these test cases to ensure that the software meets the required specifications.
- **Identifying and reporting defects:** Automation Testers are responsible for identifying and reporting defects in the software application that is being tested. They document these defects and work with the development team to resolve them.
- **Maintaining testing scripts and frameworks:** Automation Testers are responsible for maintaining the testing scripts and frameworks. This includes updating the test scripts when changes are made to the software application and maintaining the testing frameworks to ensure that they remain effective.
- **Collaborating with developers and other team members:** Automation Testers work closely with developers and other team members to ensure that the software application is tested thoroughly and that defects are resolved in a timely manner.

- **Staying up-to-date with testing technologies and trends:** Automation Testers are responsible for staying up-to-date with the latest testing technologies and trends. This includes attending conferences, reading industry publications, and participating in online forums and discussions.

In summary, the roles and responsibilities of an Automation Tester include designing and implementing automated testing frameworks, developing and executing test cases, identifying and reporting defects, maintaining testing scripts and frameworks, collaborating with developers and other team members, and staying up-to-date with testing technologies and trends.







CHAPTER3

TECHNOLOGIES LEARNT DURING INTERNSHIP

Software Development Methodologies

Software development methodologies are systematic approaches to software development that provide a framework for organizing and managing the process of creating software. There are several different software development methodologies, each with its own unique strengths and weaknesses, and each suited to different types of projects and teams.

One of the most popular software development methodologies is the Agile methodology. Agile methodologies emphasize collaboration, flexibility, and rapid iteration, and are well-suited to projects with rapidly evolving requirements or in which teams are distributed across multiple locations. The Agile methodology is characterized by short development cycles, frequent testing and integration, and a focus on delivering working software as quickly as possible. The Agile approach emphasizes continuous improvement and emphasizes communication and collaboration among team members.

Another popular software development methodology is the Waterfall methodology. The Waterfall methodology is a linear, sequential approach to software development in which each phase of the project is completed before moving on to the next. This methodology is best suited to projects with clearly defined requirements and a fixed budget, timeline, and scope. The Waterfall approach is highly structured and emphasizes planning and documentation, with an emphasis on delivering a fully functional product at the end of the development cycle.

A third software development methodology is the DevOps methodology. DevOps is a combination of software development and operations that emphasizes collaboration and communication between development and operations teams. The DevOps methodology aims to streamline the software development process by automating as much of the process as possible, reducing errors and delays, and improving the quality of the software being developed. DevOps is well-suited to organizations that are looking to improve their software development processes and reduce time-to-market.

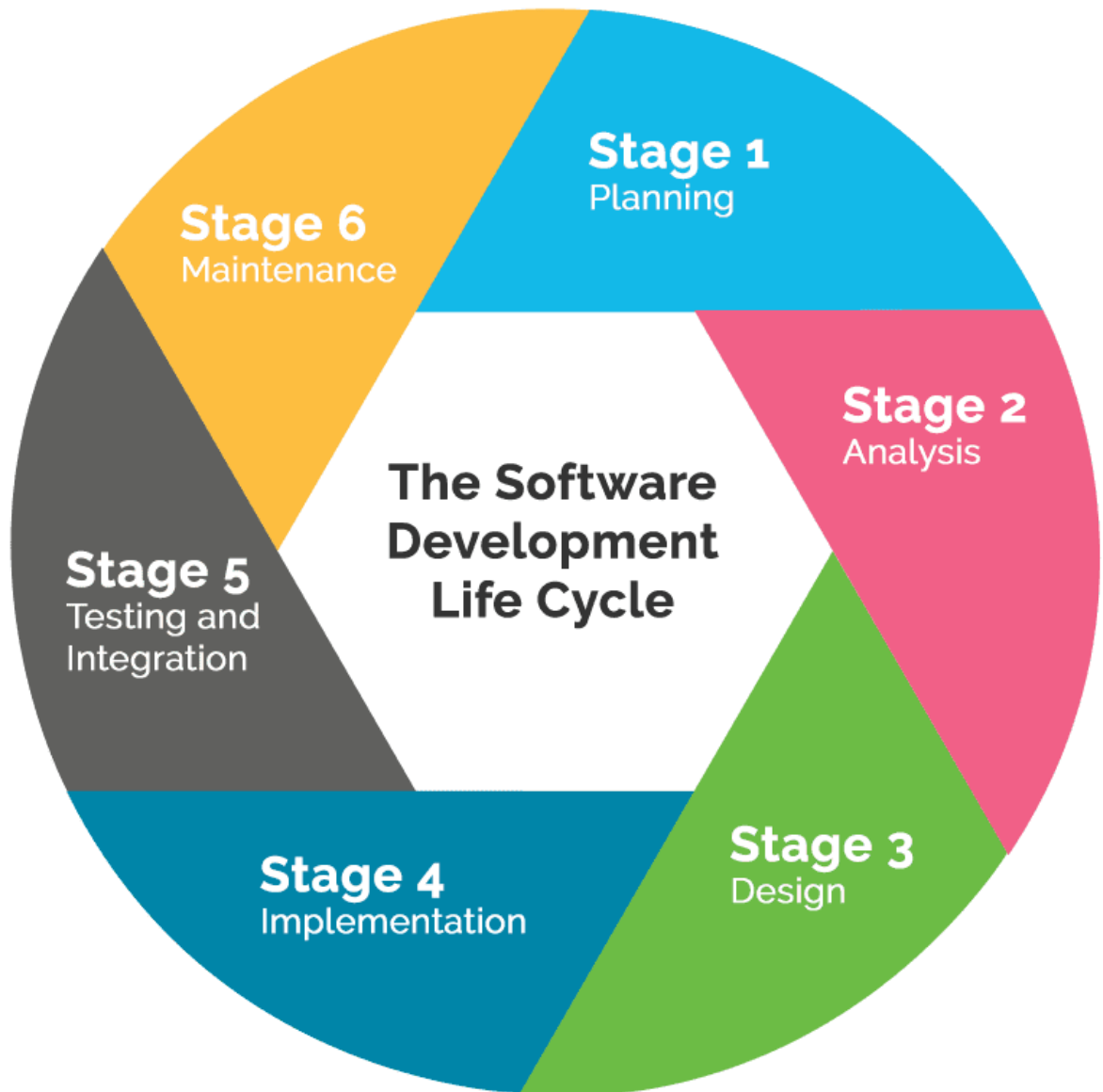
Regardless of which software development methodology is used, the software development process typically begins with requirements gathering and analysis. This phase involves identifying the goals of the software project, defining the scope and timeline of the project, and gathering information about the users of the software

and their needs. Once the requirements have been gathered and analyzed, the design phase begins. During the design phase, the software architecture is defined, and the software is designed to meet the requirements identified in the analysis phase.

The next phase of the software development process is implementation. During this phase, the software is coded and tested, and any defects or errors are identified and corrected. The implementation phase is followed by testing, during which the software is tested to ensure that it meets the requirements identified in the analysis phase. Once testing is complete, the software is deployed to production, where it can be used by end-users.

In conclusion, software development methodologies are essential for organizing and managing the complex process of creating software. There are several different software development methodologies available, each with its own unique strengths and weaknesses, and each suited to different types of projects and teams.

Regardless of which methodology is used, the software development process typically involves requirements gathering and analysis, design, implementation, testing, and deployment. By following a well-defined software development methodology, organizations can improve their software development processes, reduce time-to-market, and deliver higher-quality software to their customers.



Git

Git is a distributed version control system that is widely used in software development to manage source code and track changes over time. Git is a popular choice for managing code because of its ease of use, flexibility, and support for distributed workflows. It provides a powerful set of features that allow developers to collaborate on projects, manage changes, and track project history.

One of the key features of Git is its support for branching and merging. Git allows developers to create new branches to work on specific features or fixes, without affecting the main codebase. This makes it easy to collaborate on projects and work on different parts of the codebase simultaneously. Git also provides powerful

merging capabilities that allow developers to merge changes from different branches back into the main codebase, ensuring that all changes are tracked and managed properly.

Another important feature of Git is its support for distributed workflows. Git allows developers to work on code locally, without requiring a centralized server or repository. This makes it easy to work on code even when internet connectivity is limited or unavailable. Git also provides support for remote repositories, allowing developers to collaborate on code with others regardless of location.

Git also provides a range of tools and features for tracking changes and managing project history. Git allows developers to view a complete history of all changes to a project, including who made the changes and when. This makes it easy to track project progress and identify issues or bugs introduced by specific changes. Git also provides support for tagging and versioning, allowing developers to mark important milestones in a project's history and create specific versions of the codebase.

Git is highly customizable and extensible. Git provides a powerful plugin architecture that allows developers to add custom plugins and extensions to the system. This makes it possible to integrate Git with other tools and workflows, and to customize Git to meet the specific needs of a project or development team.

Overall, Git is a powerful and flexible version control system that is widely used in software development. Its support for branching and merging, distributed workflows, and project history tracking make it a valuable tool for managing code and collaborating on projects. With its range of features and capabilities, Git is an essential tool for any software development project looking to improve code quality, manage changes, and track project progress.


```
$ git init
Initialized empty Git repository in /tmp/tmp.IMBYSY7R8Y/.git/
$ cat > README << 'EOF'
> Git is a distributed revision control system.
> EOF
$ git add README
$ git commit
[master (root-commit) e4dcc69] You can edit locally and push
to any remote.
 1 file changed, 1 insertion(+)
 create mode 100644 README
$ git remote add origin git@github.com:cdown/thats.git
$ git push -u origin master
```

Software Testing Introduction

Software testing is a crucial aspect of software development that involves evaluating the quality and functionality of a software product to ensure that it meets the intended requirements and specifications. The goal of software testing is to identify any defects or bugs in the software and to ensure that it functions as intended under different conditions and scenarios. This helps to improve the quality of the software, reduce the risk of errors, and enhance the user experience.

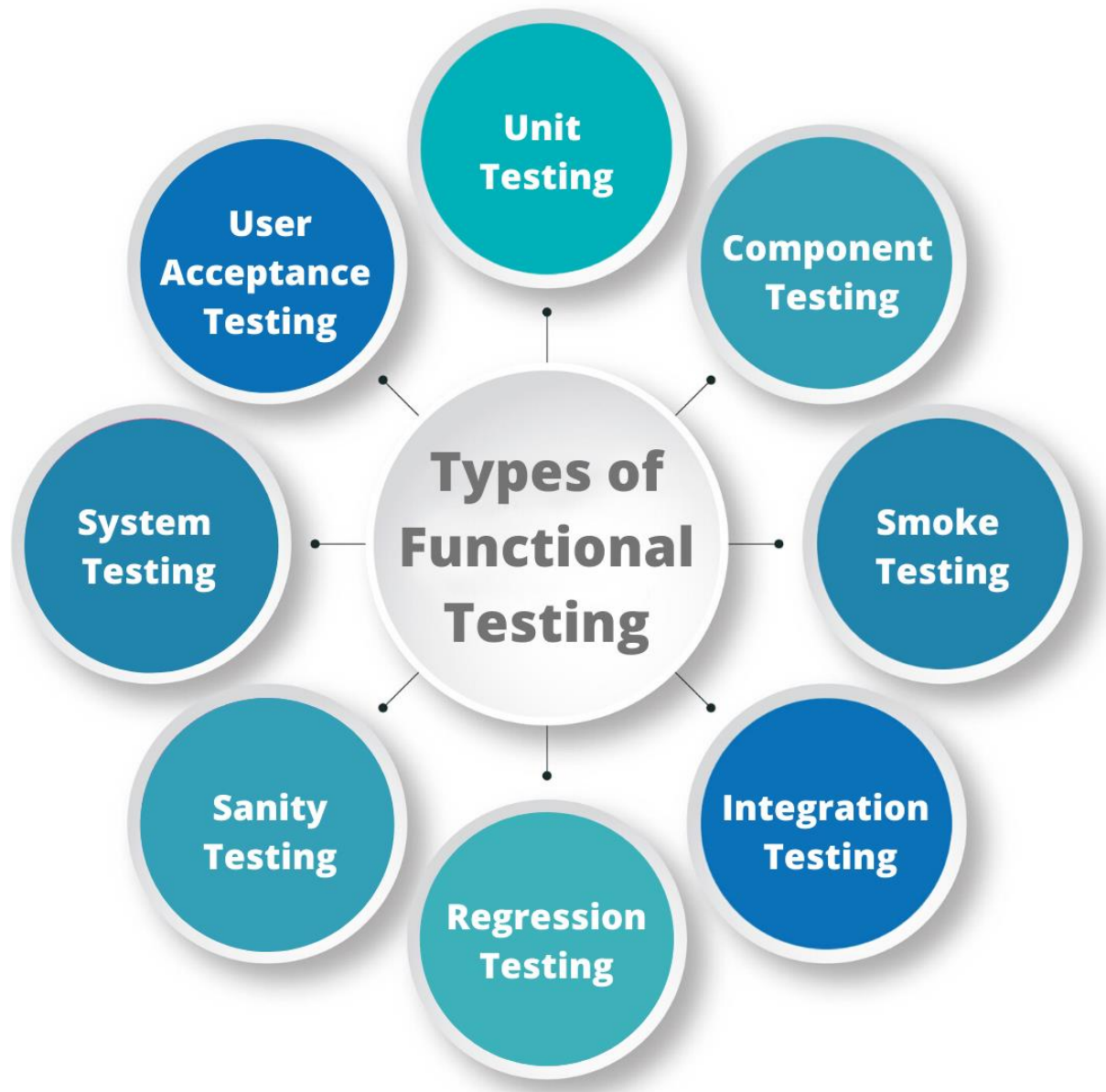
Software testing can be performed at various stages of the software development lifecycle, including during the requirements gathering phase, the design phase, the coding phase, and the deployment phase. Testing can be done manually or using automated tools, and can include a variety of techniques and methods, such as black-box testing, white-box testing, integration testing, regression testing, and acceptance testing.

Black-box testing is a testing technique that evaluates the functionality of a software product without looking at the internal code or structure. The tester examines the inputs and outputs of the software and tests its behavior under different conditions to ensure that it meets the specified requirements. White-box testing, on the other hand, involves examining the internal code and structure of the software to evaluate its logic, control flow, and other aspects. This helps to ensure that the software functions correctly and efficiently.

Integration testing is a testing technique that evaluates how different components or modules of the software interact with each other. It helps to identify any compatibility issues or errors that may arise when integrating different parts of the software. Regression testing is a type of testing that is performed after making changes to the software to ensure that it still functions as intended and that the changes have not introduced any new bugs or errors.

Acceptance testing is a type of testing that is performed to evaluate whether the software meets the user's requirements and specifications. It involves testing the software under different scenarios and conditions to ensure that it performs as expected and meets the user's needs.

Overall, software testing is a critical aspect of software development that helps to ensure the quality and functionality of the software product. It helps to identify any defects or bugs in the software and to ensure that it functions as intended under different conditions and scenarios. By performing a variety of testing techniques and methods, software testers can help to improve the quality of the software, reduce the risk of errors, and enhance the user experience.



Java Basics

Java is a high-level, object-oriented programming language that is used to develop a wide range of applications, including desktop and mobile applications, web applications, and enterprise software. It was first introduced by Sun Microsystems in 1995 and has since become one of the most popular programming languages in the world. One of the key features of Java is its platform independence, which means that Java programs can run on any platform that supports the Java Virtual Machine (JVM). This makes it a versatile language that can be used across multiple operating systems, including Windows, Linux, and macOS.

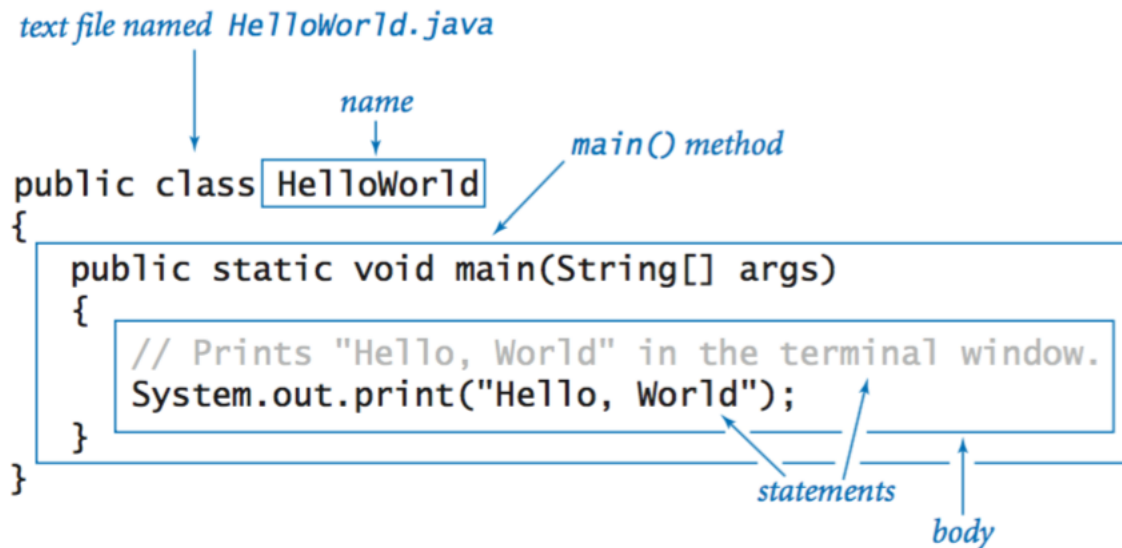
Java is a strongly typed language, which means that every variable or data type must be declared before it can be used in a program. This helps to prevent errors and improve the stability of the code. Java also uses the concept of classes and objects to organize code. A class is a blueprint or template that defines the properties and behavior of an object. An object is an instance of a class that contains data and methods that can be used to manipulate that data.

One of the key benefits of using Java is its extensive standard library, which provides developers with a wide range of pre-built classes and functions that can be used to solve common programming problems. The standard library includes classes for working with strings, dates, and times, as well as classes for working with input and output streams, networking, and file I/O. Additionally, Java provides support for multithreading, which enables a program to execute multiple threads or processes simultaneously. This can help to improve the performance of the program and reduce the time it takes to complete a task.

Another key feature of Java is its security model. Because Java programs run on the JVM, they are isolated from the underlying operating system, which helps to prevent malicious code from affecting other parts of the system. Additionally, Java provides a range of built-in security features, such as code signing, which can be used to ensure that the code being executed is legitimate and has not been tampered with.

Java is also known for its compatibility and backward compatibility, which means that code written in older versions of the language will continue to run on newer versions. This helps to ensure that code written in Java is future-proof and can be maintained and updated over time. Additionally, Java provides support for open standards, such as XML and REST, which makes it easier for developers to integrate their applications with other systems and technologies.

In conclusion, Java is a versatile and powerful programming language that has become one of the most popular languages in the world. It is platform independent, strongly typed, and supports multithreading, making it a reliable and efficient choice for developing a wide range of applications. With its extensive standard library, built-in security features, and compatibility with open standards, Java is an ideal choice for developers looking to build robust, scalable, and secure software.



Data & Analysis (Introduction to SQL)

Data analysis has become an essential part of many industries, and the use of SQL (Structured Query Language) is a fundamental tool in this field. SQL is a standard language used to manage and manipulate relational databases. It is used to create, modify, and retrieve data from databases, making it an essential tool for data analysts.

SQL has a simple syntax that allows data analysts to write queries that extract data from databases, filter data based on specific criteria, and perform calculations and aggregation on the data. This makes it easy for data analysts to extract insights from large amounts of data and make data-driven decisions.

SQL is also a versatile language that can be used with a wide range of relational database management systems (RDBMS), including Oracle, MySQL, PostgreSQL, and Microsoft SQL Server. This means that data analysts can use SQL to work with data across a range of different systems, making it a valuable tool for managing and analyzing data across multiple platforms.

One of the key advantages of SQL is its ability to handle large datasets efficiently. SQL uses indexing and other optimization techniques to speed up data retrieval and processing, making it possible to analyze large datasets quickly and efficiently. This is essential for data analysts, who often work with large amounts of data that need to be processed and analyzed quickly.

SQL is also a powerful tool for data manipulation and transformation. Data analysts can use SQL to clean, transform, and reshape data, making it easier to work with and analyze. This can include removing duplicates,

splitting data into different tables, and merging data from multiple sources. These transformation capabilities allow data analysts to work with complex data structures and derive insights from data that may not be immediately apparent.

Another important feature of SQL is its support for data security and access control. SQL provides robust security features that allow data analysts to control access to sensitive data, ensuring that only authorized users can view and modify data. This is critical in industries such as healthcare, finance, and government, where strict data security requirements must be met.

In conclusion, SQL is an essential tool for data analysts working with relational databases. Its simple syntax, versatility, and ability to handle large datasets efficiently make it an ideal language for managing and manipulating data. SQL's data manipulation and transformation capabilities, support for data security, and access control make it an essential tool for data analysts in many industries. With its wide range of features and capabilities, SQL is an essential tool for any data analyst looking to extract insights from data and make data-driven decisions.

year	category	nominee	movie	winner
2010	actress in a leading role	Nicole Kidman	Rabbit Hole	false
2010	actress in a leading role	Jennifer Lawrence	Winter's Bone	false
2010	actress in a leading role	Michelle Williams	Blue Valentine	false
2010	actress in a leading role	Natalie Portman	Black Swan	true
2010	actress in a leading role	Annette Bening	The Kids Are All Right	false
2010	actor in a leading role	Jesse Eisenberg	The Social Network	false
2010	actor in a leading role	Colin Firth	The King's Speech	true
2010	actor in a leading role	James Franco	127 Hours	false
2010	actor in a leading role	Javier Bardem	Biutiful	false
2010	actor in a leading role	Jeff Bridges	True Grit	false

Patterns in general.

In software development, design patterns are reusable solutions to common problems that developers face while designing software systems. Design patterns are used to help developers create software architectures that are flexible, maintainable, and easy to modify. There are three main categories of design patterns: structural, behavioral, and creational patterns.

Structural patterns are design patterns that are used to organize classes and objects into larger structures, such

as class hierarchies or object networks. These patterns help to simplify the relationships between classes and objects and make the code more modular and reusable. Some common examples of structural patterns include Adapter, Bridge, Composite, and Decorator patterns.

Behavioral patterns are design patterns that are used to manage the interactions between objects and classes. These patterns help to define the communication and coordination between objects and classes, and can be used to implement complex behaviors in software systems. Some common examples of behavioral patterns include Chain of Responsibility, Command, Interpreter, and Observer patterns.

Creational patterns are design patterns that are used to create and manage the creation of objects. These patterns help to encapsulate the object creation process and provide a flexible and reusable mechanism for creating objects. Some common examples of creational patterns include Factory, Singleton, Builder, and Prototype patterns.

A factory pattern is a creational pattern that provides a way to create objects without specifying the exact class of object that will be created. The Factory pattern encapsulates the object creation process and provides a simple and flexible way to create objects. The Factory pattern is commonly used in situations where there are many different types of objects that need to be created, but the exact type of object is not known at compile time.

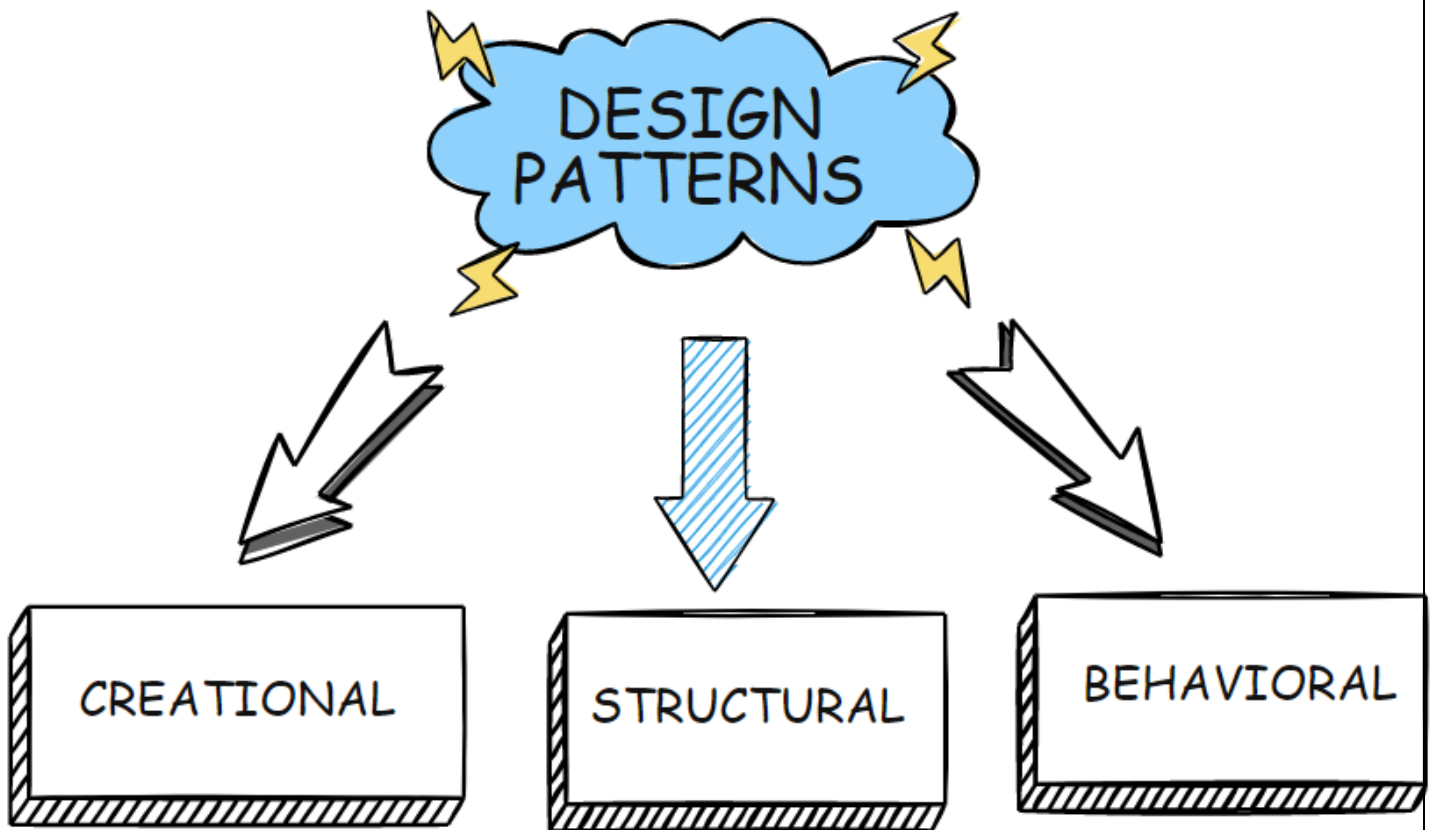
A strategy pattern is a behavioral pattern that defines a family of algorithms and encapsulates each one as an object. The Strategy pattern provides a way to select an algorithm at runtime based on the situation. This pattern is useful when there are multiple algorithms that can be used to solve a problem, and the decision about which algorithm to use depends on the context.

A builder pattern is a creational pattern that separates the construction of an object from its representation. The Builder pattern allows developers to create complex objects step by step, and provides a way to vary the object's internal representation without affecting its construction process. This pattern is useful when there are complex objects that need to be created with multiple attributes and properties.

Singleton pattern is a creational pattern that ensures that only one instance of a class is created and provides a global point of access to that instance. The Singleton pattern is commonly used in situations where there needs to be a single point of control or coordination for a system. This pattern can be useful for managing resources,

such as database connections or thread pools.

In conclusion, design patterns are an essential aspect of software development that provide a way to solve common problems and create flexible, maintainable, and reusable software systems. The three main categories of design patterns are structural, behavioral, and creational patterns, each with their own unique benefits and use cases. Some of the most commonly used design patterns include Factory, Strategy, Builder, and Singleton patterns, which provide powerful mechanisms for creating objects, managing behavior, and controlling access to resources.



Junit

Junit is a widely used open-source Java testing framework that is designed to simplify the process of writing and executing automated unit tests. It provides a range of features that allow developers to write and run tests quickly and efficiently, without requiring them to manually configure and manage the testing process. Junit is a

popular choice for Java-based projects because of its ease of use, flexibility, and support for a wide range of testing scenarios.

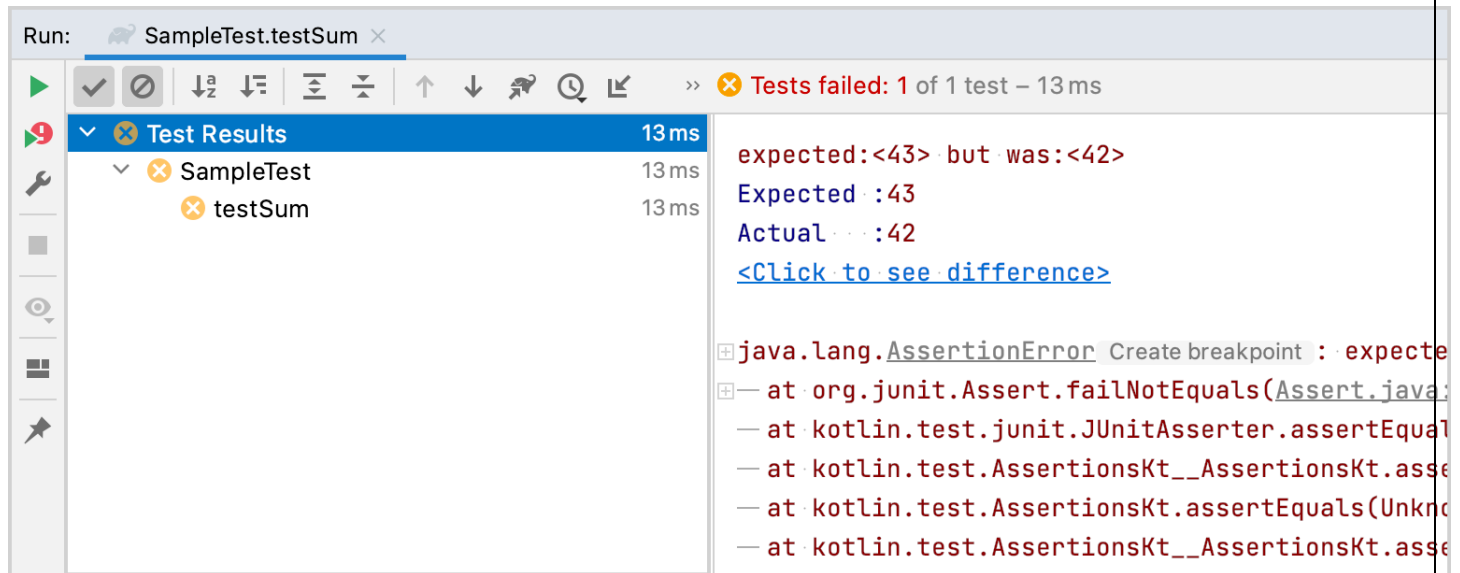
One of the key features of Junit is its support for annotations. Junit annotations allow developers to specify which methods are test methods, which methods should be run before or after each test method, and which methods should be run before or after all test methods. This makes it easy to configure tests and manage testing scenarios without requiring developers to write complex test scripts or test frameworks. Junit also provides a range of built-in assertions that allow developers to test for specific conditions and outcomes, making it easier to write reliable and effective tests.

Another important feature of Junit is its support for test suites. Junit test suites allow developers to group multiple test cases into a single suite, making it easier to run a set of related tests and manage testing scenarios. Test suites can be run in parallel, allowing for faster testing and reducing the time and effort required to test large projects or complex codebases.

Junit also provides a range of tools and features for reporting and analyzing test results. Junit provides detailed reports on test results, including information on which tests passed or failed, which methods were tested, and which assertions were successful or failed. This can help developers identify issues and debug problems quickly and ensure that code changes do not introduce new bugs or issues.

Junit is highly customizable and extensible. Junit provides a range of customization options that allow developers to configure the testing process to meet the specific needs of their projects. Junit also provides a plugin architecture that allows developers to add custom plugins and extensions to the framework, making it possible to integrate Junit with other testing tools and frameworks.

Overall, Junit is a powerful and flexible testing framework that is widely used in Java-based projects. Its support for annotations, test suites, reporting and analysis, and customization make it a valuable tool for managing and executing automated unit tests. With its range of features and capabilities, Junit is an essential tool for any Java-based project looking to improve code quality and ensure reliable and effective testing.



Page Object and Page Factory

Page Object Model (POM) is a design pattern used in test automation that aims to improve the maintainability, scalability, and reusability of automated tests. In POM, each web page or screen of the application is represented as a separate class, known as a Page Object, which contains all the elements and actions that can be performed on that page. By using Page Objects, testers can write more concise, organized, and maintainable tests, which are easier to update and extend as the application evolves.

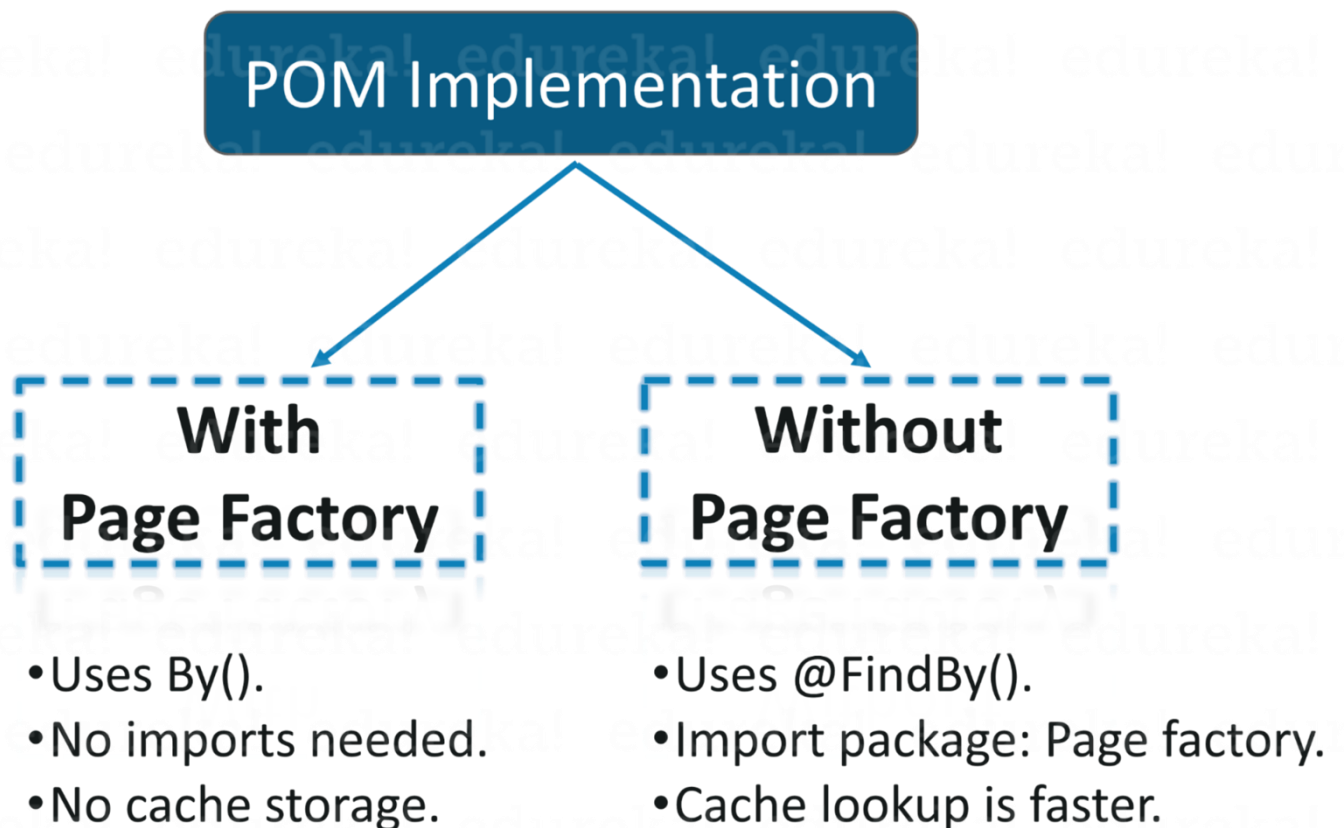
Page Factory is a concept in Selenium WebDriver that is used to initialize the Page Objects and their web elements. It is a design pattern that separates the Page Object creation from its use, which helps to improve the readability and maintainability of the code. With Page Factory, testers can define the web elements of a Page Object as variables and use annotations to locate and initialize them automatically. This eliminates the need to use the `findElement` method for each element, which can lead to duplicate code and reduced performance.

To use Page Factory in Selenium WebDriver, testers can create a separate class for each Page Object, define the web elements as variables using annotations such as `@FindBy`, and use the `PageFactory.initElements` method to initialize the Page Object. Once the Page Object is initialized, the tester can perform actions and assertions on the web elements using the methods defined in the Page Object.

One of the key benefits of using Page Object and Page Factory in test automation is that it helps to improve the maintainability and scalability of the tests. By separating the Page Objects from the test logic, testers can create more modular and reusable tests that are easier to update and maintain. Additionally, Page Factory helps to improve the performance of the tests by reducing the number of `findElement` calls and improving the readability

of the code.

Overall, Page Object and Page Factory are powerful tools in test automation that help to improve the maintainability, scalability, and reusability of automated tests. By using these concepts, testers can create more organized, efficient, and readable tests that are easier to update and maintain.



TestNG

TestNG is an open-source, Java-based testing framework that is designed to make automated testing easier, more efficient, and more maintainable. It is an extension of the JUnit testing framework with additional features and capabilities that make it more powerful and flexible. TestNG offers a range of benefits that make it an ideal choice for testing Java applications, including support for multiple test frameworks, parallel testing, and test configuration through XML files.

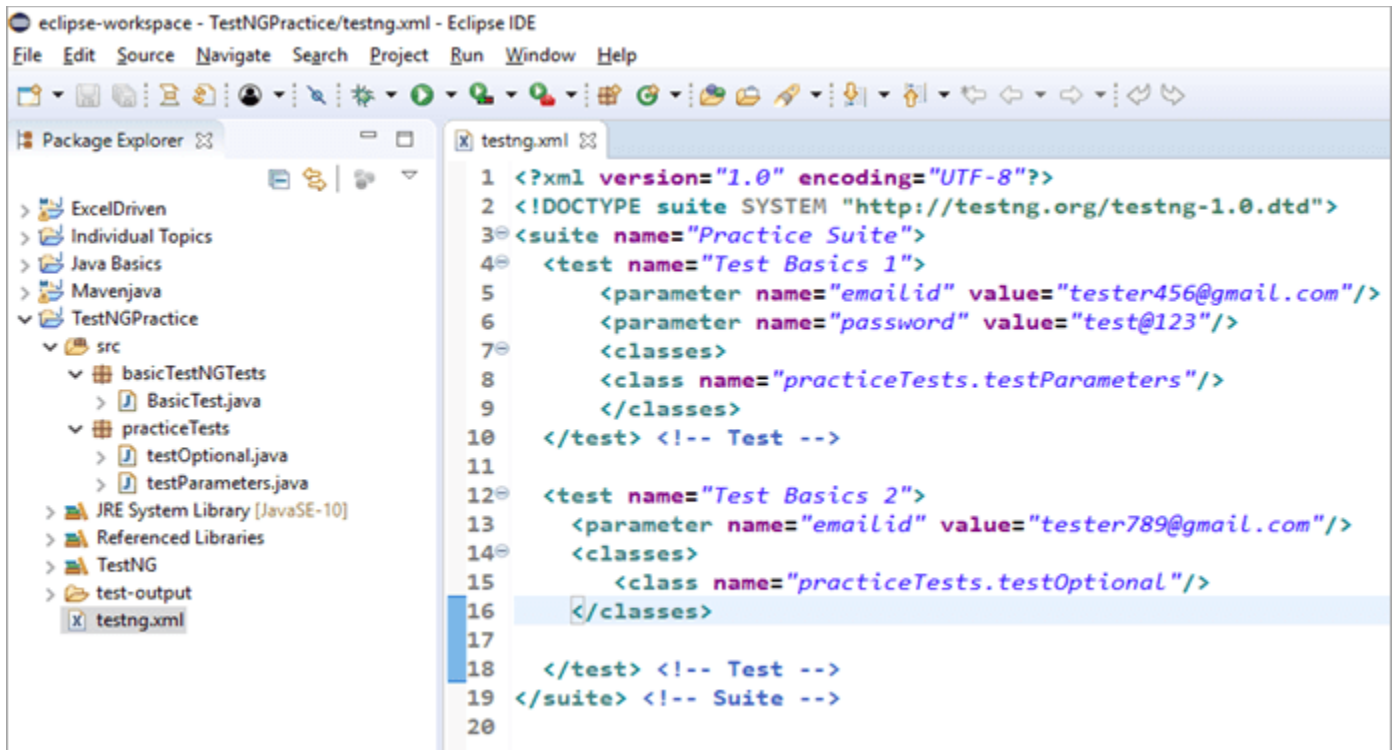
One of the key benefits of TestNG is its support for multiple test frameworks. TestNG is designed to work with a range of test frameworks, including JUnit, which allows developers to leverage existing tests and integrate them into TestNG test suites. This makes it easy to adopt TestNG for existing projects without having to rewrite existing tests. Additionally, TestNG provides a number of features that are not available in JUnit, such as the ability to define test dependencies, grouping, and prioritization, as well as support for data-driven testing.

Another important feature of TestNG is its support for parallel testing. TestNG makes it easy to run tests in parallel, allowing developers to reduce the time it takes to run their test suites. This is particularly useful for projects with large test suites, where running tests sequentially can take a significant amount of time. TestNG supports parallel testing at the class, method, and suite levels, making it easy to customize parallelism to suit specific project requirements.

TestNG also offers the ability to configure tests using XML files. This allows developers to define test suites, test groups, and test configurations in a declarative way, making it easier to manage large test suites and keep them organized. TestNG's XML configuration files allow developers to specify parameters for tests, set up data providers, and define test dependencies and grouping. This can help simplify test maintenance and reduce the amount of code required to set up and run tests.

In addition to these features, TestNG also provides a number of other useful capabilities, such as support for test reporting, listeners, and test retries. TestNG's reporting capabilities allow developers to generate detailed reports on test results, including test execution times, failures, and errors. TestNG listeners provide a way to customize the behavior of tests and test suites by intercepting events and performing actions based on those events. TestNG also includes support for retrying failed tests, which can help ensure that tests pass reliably and reduce the amount of time required to diagnose and fix issues.

Overall, TestNG is a powerful and flexible testing framework that is well-suited for testing Java applications. Its support for multiple test frameworks, parallel testing, and XML configuration files make it easy to integrate into existing projects and manage large test suites. With its range of features and capabilities, TestNG is a valuable tool for any developer looking to build reliable and maintainable automated tests.



Maven

Maven is a popular open-source build automation tool that is widely used in Java-based projects. It provides a powerful set of features that allow developers to manage dependencies, automate the build process, and generate documentation for their projects. Maven is a popular choice for managing Java-based projects because of its ease of use, flexibility, and support for a wide range of plugins and configurations.

One of the key features of Maven is its support for dependency management. Maven makes it easy to manage project dependencies by providing a centralized repository of libraries and modules. This repository can be used to download and install dependencies automatically, without requiring developers to manually manage dependencies or download and install them separately. This makes it easy to manage complex projects with many dependencies and ensures that all dependencies are up to date and compatible with each other.

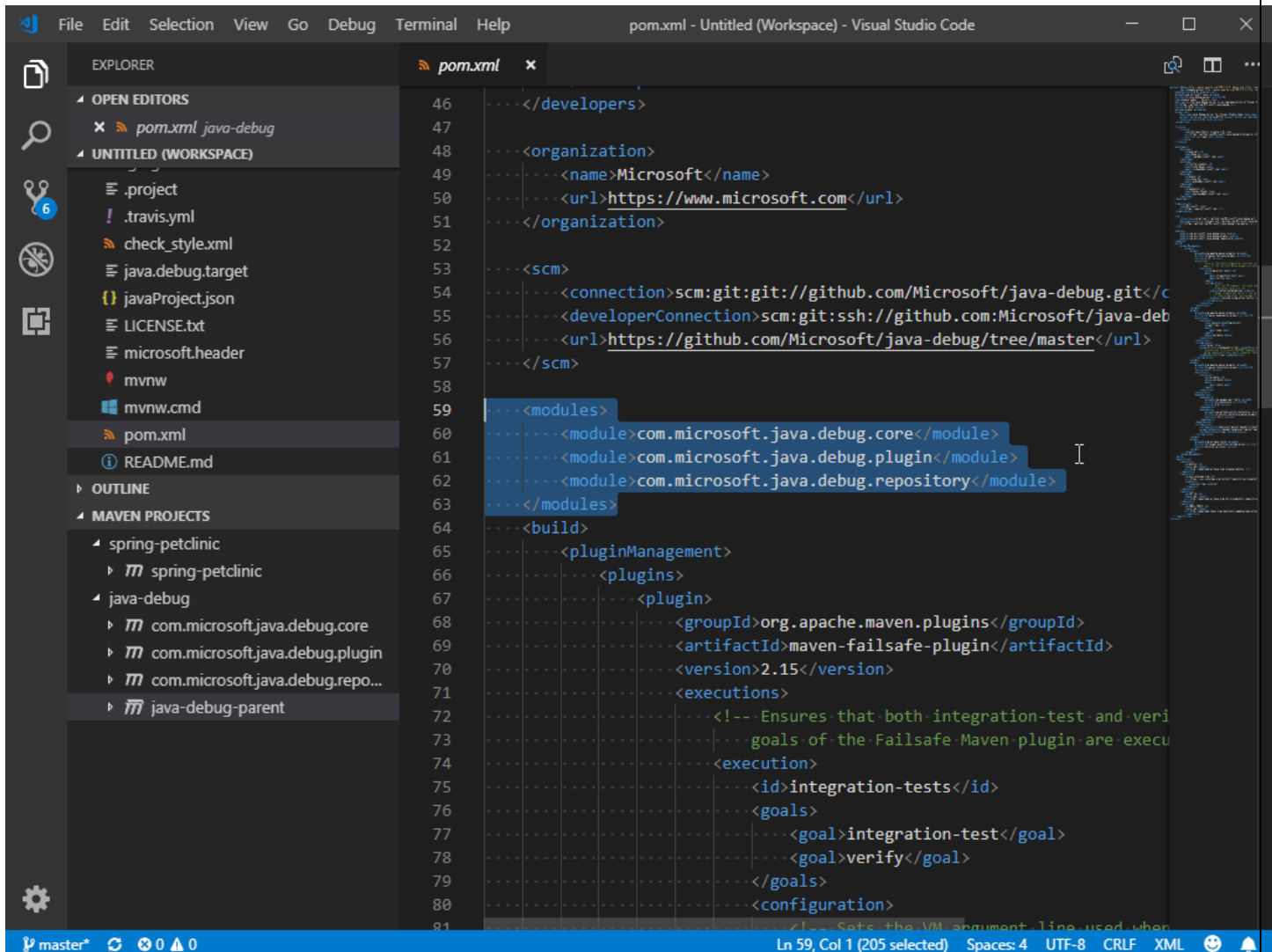
Another important feature of Maven is its support for automation. Maven automates the entire build process,

from compiling source code to packaging the final product. This makes it easy to build and package Java-based projects without having to write complex build scripts or configure build tools manually. Maven also provides a range of built-in plugins and configurations that make it easy to configure the build process to meet the specific needs of a project.

Maven also provides support for generating documentation. Maven makes it easy to generate project documentation automatically, using tools like Javadoc and Doxygen. This can help ensure that project documentation is always up to date and consistent with the codebase. Additionally, Maven provides a range of plugins for generating reports on project status, code coverage, and other important metrics. This can help developers identify issues and optimize project performance.

Maven is highly customizable and extensible. Maven provides a powerful plugin architecture that allows developers to add custom plugins and configurations to meet the specific needs of their projects. Additionally, Maven allows developers to create custom archetypes, which are templates for creating new projects with predefined configurations and structures. This can help streamline project setup and reduce the time and effort required to get a project up and running.

Overall, Maven is a powerful and flexible build automation tool that is widely used in Java-based projects. Its support for dependency management, automation, and documentation generation make it a valuable tool for managing complex projects and ensuring project quality. With its range of features and plugins, Maven is an essential tool for any Java-based project looking to streamline the build process and automate development workflows.



Selenium WebDriver

Selenium WebDriver is a popular open-source tool used for automating web browsers. It allows developers and testers to create automated tests for web applications, which can save time and effort compared to manual testing. Selenium WebDriver supports a wide range of programming languages, including Java, Python, and C#, and can be used to automate testing on a variety of browsers, including Chrome, Firefox, and Safari.

One of the key advantages of using Selenium WebDriver is that it allows for the creation of automated tests that can run on different operating systems and browsers. This is because the tool uses a web driver, which acts as a bridge between the testing framework and the web browser. The web driver provides a consistent interface for

interacting with the browser, regardless of the underlying platform. This means that developers and testers can write a single test script that can be used to test the application on multiple browsers and operating systems, rather than having to write separate scripts for each platform.

Another advantage of Selenium WebDriver is that it provides a high degree of flexibility and control over the testing process. Testers can use the tool to interact with various elements of the web page, such as buttons, links, and text fields, and simulate user actions, such as clicking and typing. This allows for the creation of more realistic and accurate test scenarios, which can help to uncover defects that may not be found through manual testing.

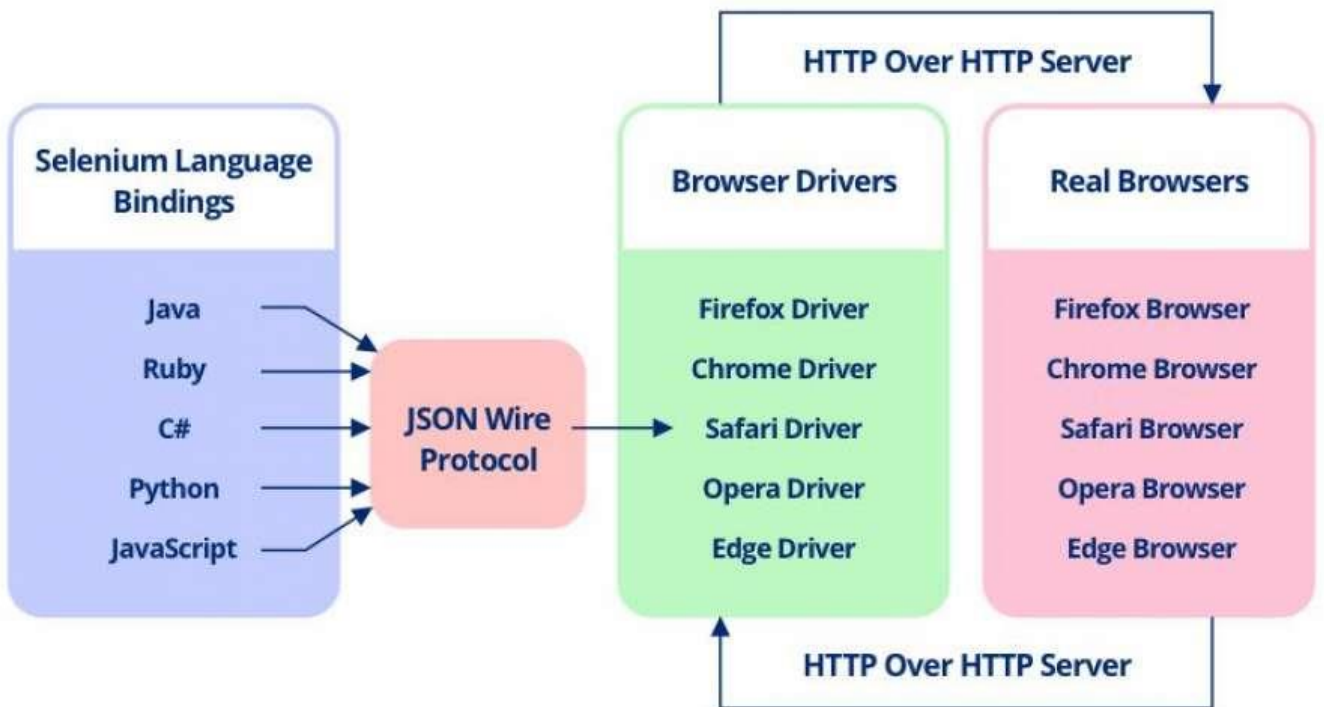
Selenium WebDriver also supports various types of testing, including functional testing, regression testing, and performance testing. Testers can use the tool to automate the execution of test cases, which can help to save time and reduce the risk of human error. In addition, Selenium WebDriver provides features like screenshot capture and reporting, which can help testers to identify and diagnose defects more easily.

However, there are some challenges associated with using Selenium WebDriver. One of the main challenges is the need to maintain test scripts as the application being tested evolves. Since web applications are constantly changing, testers may need to update their test scripts frequently to ensure that they continue to work properly. This can be time-consuming and may require a high level of technical expertise.

Another challenge is the difficulty of setting up and configuring Selenium WebDriver for testing. Testers may need to install and configure various dependencies, such as web drivers and browser extensions, and ensure that they are properly integrated with the testing framework. This can be a complex process and may require a high degree of technical skill.

In conclusion, Selenium WebDriver is a powerful tool for automating web browser testing that offers a wide range of benefits, including cross-browser compatibility, flexibility, and control over the testing process. However, it also presents some challenges, such as the need to maintain test scripts and the difficulty of setting up and configuring the tool for testing. Overall, Selenium WebDriver is a valuable asset for developers and testers seeking to improve the efficiency and effectiveness of their testing process.

Selenium WebDriver Architecture



Jenkins

Jenkins is an open-source automation server that is designed to automate the build, test, and deployment of software applications. It provides a powerful set of features that allow developers to automate the entire software development process, from building and testing code to deploying it to production environments. Jenkins is a popular tool for continuous integration and continuous delivery (CI/CD) pipelines, and it is widely used by development teams around the world.

One of the key features of Jenkins is its support for plugins. Jenkins has a large number of plugins that extend its functionality and make it possible to integrate with other tools and technologies. There are plugins for source code management, build tools, testing frameworks, and many other types of software tools. This makes it easy


to customize Jenkins to meet the specific needs of a development team and integrate it with existing tools and technologies.


Another important feature of Jenkins is its support for distributed builds. Jenkins can run builds on multiple machines simultaneously, which can help speed up the build process and reduce build times. This is particularly useful for large projects or projects with complex build requirements. Jenkins also supports cloud-based build environments, which can help reduce the need for on-premises infrastructure and make it easier to scale up and down as needed.


Jenkins also provides a range of tools and features for managing and monitoring builds. Jenkins allows developers to schedule builds, monitor build progress, and receive notifications when builds complete or fail. Jenkins also provides detailed logs and reports on build results, which can help developers diagnose and fix issues quickly. Additionally, Jenkins includes support for automated testing and code coverage analysis, which can help ensure that code is thoroughly tested and meet quality standards.


Jenkins is also highly customizable and extensible. Jenkins provides a powerful scripting language that allows developers to write custom scripts to automate complex build and deployment processes. Jenkins also allows developers to create custom build steps and integrate with external tools and services. This makes it possible to create a fully customized CI/CD pipeline that meets the specific needs of a development team.

Overall, Jenkins is a powerful and flexible automation server that is widely used by development teams around the world. Its support for plugins, distributed builds, and monitoring and management tools make it a valuable tool for automating the software development process. With its range of features and capabilities, Jenkins is an essential tool for any development team looking to build and deploy software applications quickly, reliably, and efficiently.

 Jenkins

 2

 Admin

 log out

Dashboard > creating-a-pipeline-in-blue-ocean > First-pull-branch >

Status

</> Changes

▶ Build Now

⚙ View Configuration

🔍 Full Stage View

🌊 Open Blue Ocean

🔑 GitHub

❓ Pipeline Syntax

Build History

trend ▾

#4

Aug 8, 2022, 2:14 PM

⊗ #3

Aug 4, 2022, 8:49 PM

⊗ #2

Aug 3, 2022, 2:18 PM

Branch First-pull-branch

Full project name: creating-a-pipeline-in-blue-ocean/First-pull-branch

Stage View

Average stage times:
(Average full run time: ~1h 29min)

#4

Aug 08
14:14

No Changes

#3

Aug 04
20:49

No Changes

#2

Aug 03
14:18

No Changes

	Declarative: Checkout SCM	Build	Test	Test	error	Deliver
	2min 29s	34s	783ms	0ms	159ms	2s
	1s	36s	36ms	1s	70ms <small>(paused for 1h 24min)</small>	5s <small>(paused for 4min 24s)</small>
	472ms	31s	37ms	1s	249ms <small>(paused for 3d 17h) aborted</small>	69ms <small>aborted</small>
	7min 27s					

Permalinks

Assignment Done During Training

The screenshot displays a web browser window with multiple tabs open, including 'Learn', 'Justin Biel', 'EPAM Indi', 'Paraphras', 'My Learnin', 'Java Basic', 'Maven Bu', 'Java Basic', 'Software T', 'Framework', and 'Summary'. The active tab is 'Summary', which shows the course page for 'Framework types summary'.

The page layout includes a dark blue header with a 'Back to workspace' link and a user profile icon. Below the header is a navigation sidebar on the left with a search bar and a list of course topics, each marked with a green checkmark. The main content area features a large blue video player with the title 'Framework types summary' and a play button. To the right of the video player is the EPAM Training Center logo. The bottom of the page shows a Windows taskbar with various application icons and a system clock indicating 7:50 PM on 4/29/2023.

Navigation Sidebar:

- Framework ✓
- Approaching to Building a Test Automation Framework ✓
 - Challenges ✓
 - Approaches ✓
 - Record & Playback ✓
 - Keyword & Data Driven Approaches ✓
 - BDD ✓
 - Hybrid Framework ✓
 - Summary ✓
- Steps for Building Hybrid Framework ✓
- Practical Task & Complete the Course ✓

Main Content Area:

Summary

Framework types summary

Framework

TRAINING CENTER

epam

Learn x Justin Bieber x EPAM India x Paraphrasing x My Learning x Java Basics x Exercise 1 "Meet Autocode" x Test | 01 - 01 x Framework x Summary | A x +

elearn.epam.com/courses/course-v1:RD_CEE+JB_ENG+0422/courseware/394e7a93bf3941a1949d61c4a3bb9968/1b7aeb0f3f9344f7b9317fb6bca2ed5/2?activate_block_id=block-v1%3ARD_CEE%2...

Back to workspace

COURSE PROGRESS DISCUSSION

Navigation Expand All

Search

- Introduction to the Java Basics Course ✓
- 1. First Programs in Java ✓
 - Theory ✓
 - Practice Practice, Module 1 ✓
 - Introduction ✓
 - Exercise 1 "Meet Autocode" ✓
 - Exercise 2 "Meet a Stranger" ✓
- 2. Data Types ✓
- 3. Conditions and Loops ✓
- 4. Arrays ✓
- 5. Classes

Exercise 1 "Meet Autocode"

The purpose of this exercise is to make you familiar with the **AutoCode** platform.
Approximate time for doing the exercise: **15 minutes**.

Description

Please, proceed to HelloAutocode class and write a simple program that prints "Hello, Autocode!" (don't print quote marks).

Autocode (External resource) (100.0 / 100.0 points)

Course is finished. Any updates made won't affect your final grade

PREVIOUS NEXT

Type here to search

8:00 PM 4/29/2023

Learn x Justin Bieber x EPAM India x Paraphrasing x My Learning x Courseware | ST x Test | 01 - 01 x Framework | Le x Summary | App x +

elearn.epam.com/courses/course-v1:EPAM+STI+ENG/courseware/bbea8191c8864320b21544ae133022b4/50b199945cad4d3cb7cf3f41a238b6f4/7?activate_block_id=block-v1%3AEPAM%2BSTI%2B...

Back to workspace

Home > Course > U1 - Introduction to Software Functional Testing > U1 - 01 - The History of Software Testing > Test

COURSEWARE PROGRESS DISCUSSION

Navigation Expand All

Search

- About this training ✓
- 01 - Introduction to Software Functional Testing ✓
 - 01 - 01 - The History of Software Testing ✓
 - Video ✓
 - Handouts ✓
 - Test ✓
 - 01 - 02 - Why Software Testing is Important and What to Test ✓
 - 01 - 03 - Soft Skills and Hard Skills of Software Tester ✓

Test

Question 1

1.0/1.0 point

The "exhaustive testing" is a...

☐ Testing type.

☐ Testing level consisting of full requirements analysis and some check lists creation.

☒ Test approach in which the test suite comprises all combinations of input values and preconditions.

☐ Test approach in which the application is tested in all supported environments.

Submit You have used 1 of 1 attempt

Show answer

Type here to search

7:51 PM 4/29/2023



CHAPTERS

Achievements and Certifications

EPAM India's training programs have provided me with the most up-to-date tools, methodologies, and best practices in the business, allowing us to provide high-quality work to clients. As a result, the company's client satisfaction and repeat business have increased.

Our accomplishments and certificates in EPAM training indicate our dedication to personal and professional development, as well as our willingness to take on new challenges and responsibilities. EPAM India's training initiatives will offer me with the assistance and tools we need to reach our goals and flourish in my profession as I continue to grow and develop.

Framework	Self-paced	100% Completed	Completed	...
Sep 23, 2021				
Maven Build Tool	Self-paced	Completed: Grade 100%	Completed	...
Jan 01, 2020				
Continuous Integration with Jenkins	Self-paced	Completed: Grade 100%	Completed	...
Nov 10, 2020				
WebDriver	Self-paced	Completed: Grade 100%	Completed	...
Nov 12, 2021				
Data & Analytics. Introduction to SQL	Self-paced	Completed: Grade 92%	Completed	...
Nov 17, 2021				
Java Basics	Self-paced	Completed: Grade 79%	Completed	...
Apr 12, 2022				
Software Testing Introduction (ENG)	Self-paced			

CONCLUSION

The EPAM Testing Automation Class project, which includes Maven, Selenium WebDriver, and Jenkins, offers a thorough method for learning how to use these crucial tools in software development. The project's goals are to provide users with practical knowledge and hands-on experience with these tools, which are frequently used for continuous integration, test automation, and dependency management. The project consists of four modules, and in order to become proficient in using the tools effectively, you must complete the mandatory hands-on exercises in each module. Students will gain the knowledge and skills necessary to improve the efficiency and standard of software development processes through the completion of this project.

References

- <https://theorg.com/org/epam-systems>
- <https://www.comparably.com/companies/epam-systems/mission>
- <https://welcome.epam.in/our-values>