

Rahul Shetty Selenium class

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Selenium features

- 1)open source automation testing tool
- 2)Exclusive for automating web applications
- 3)Supports multiple browsers-chrome,firefox,ie,safari
- 4)Selenium work with multiple platforms-windows,apple,linux os
- 5)Selenium supports multiple languages-java,c#,python,javascript,php,ruby
- 6)Difference between selenium and webdriver:
Selenium is a suite of tools for automating web browsers
WebDriver is child of selenium. **Selenium WebDriver** is an open-source collection of APIs which is used for testing web applications.

Selenium webdriver Architecture

Selenium WebDriver Architecture Simplified:



- After you trigger the Test, complete Selenium code (Client) which we have written will be converted to Json format
- Generated Json is sent to Browser Driver (Server) through http Protocol
Note: Each browser contains a separate browser driver
- Browser drivers communicate with its respective browser and executes the commands by interpreting Json which it received on the browser.
- Browser Driver receives responses back from the browser and it sends Json response back to Client.

Css regular expression input[pass*='value']...Notice the postion of star(asterick)

Css parent child traversing syntax parentidntification<space> childtagname eg:div[class='login-container'] h1
Update:This can also be used for parent to grandchild traversal.

Css if the class name is compoud then in the space put a dot. Eg <div class="book-a-flight hide-desktop visible-sm">
Css for the above will be ".book-a-flight.hide-desktop.visible-sm".Notice spaces have been removed by dots
Css child traversal using index can be written like td:nth-child(4)

Another way to validate css /xpath
Go to console xpath- >\$x("your xpath")
css-> \$("your css")

Practice websites

- 1)<https://rahulshettyacademy.com/seleniumPractise/#/>
- 2)<https://rahulshettyacademy.com/AutomationPractice/>
- 3)<https://rahulshettyacademy.com/angularpractice/>
- 4)<http://www.qaclickacademy.com/>
- 5)<https://rahulshettyacademy.com/locatorspractice/> -password is rahulshettyacademy
- 6)<https://the-internet.herokuapp.com/>
- 7)<https://www.rahulshettyacademy.com/loginpagePractise/>
- 8)<https://jqueryui.com/droppable/> -For drag and drop

Difference between xpath and css

With xpath you can traverse from child back to parent and with css it is not possible

Selenium exceptions-<https://www.guru99.com/exception-handling-selenium.html>

ElementNotinteractable:

When a web element is present in the HTML DOM but it is not in the state that can be interacted.Reason

1. Element is not visible
2. Element is present in off screen (After scroll down it will display)
3. Element is present behind any other element
4. Element is disable

32. Browser plugins- Selectorhub to identify and validate the elements o...

Implicit wait syntax

```
driver.manage().timeouts().implicitlyWait(Duration.ofSeconds(2000)); //selenium version 4
```

40. Generating xpaths based on the button texts on the page with the example

Syntax://button[text()='Log Out']

44. Identify locators using Siblings with Xpath traverse

- Syntax eg://header/div/button[1]/following-sibling::button[1] (combination of both parent to child and its sibling traversal)

45. How to Traverse from child element to parent element with xpath – Example

- Syntax: eg //header/div/button[1]/parent::div

46. Automate Browser navigations and window properties with Selenium Webdriver

Difference between get and navigate in selenium

driver.get() is used to navigate particular URL(website) and wait till page load.(ie inbuilt synchronisation wait .get() will wait by default until all components of the page fully loaded)
driver.navigate() is used to navigate to particular URL and does not wait to page load. It maintains browser history or cookies to navigate back or forward.

52. Handle Dynamic dropdowns with Webdriver API

We can also use index with xpath eg: (//*[@id='chennai'])[1]

There is a difference between elementnotvisible exception and nosuchelementfound exception

53. Parent-Child relationship locator to Identify the objects Uniquely

We can also write xpath with parent child relationship(Note there is another way using slash and is called as parent –child traversal eg: //div/h2/button)
Parent child relationship parent xpath <space> childxpath(similar with css also as noted above)

//div[@id='ControlGroupSearchView_AvailabilitySearchVieworiginStation1_CTNR']//*[@value='BLR']

Can also be used in css like [id='radio-btn-example'] [value='radio1']

55. Handling AutoSuggestive dropdowns using Selenium

This needs to be done by getting list of all elements and iterating and matching the element to be selected

Lesson 66 download code for more understanding of lectures

61. Validating if UI Elements are disabled or enabled with Attributes

Isenabled() / isselected() / isdisplayed methods are used for enabled/disabled attributes.

Sometime this inbuilt method will not work.In that case observe the change in attributes of html element and write your conditions .This act as workaround

65. Handling Java Alerts using Selenium Webdriver

```
driver.switchTo().alert().accept();
driver.switchTo().alert().dismiss();
```

There are different types of alert boxes. 1) simple alert 2) confirmation alert 3) prompt alert

Refer guru99 for more info regarding alerts

Section 8: Deep dive into functional testing

This section has practical example of selecting items to be added in cart dynamically. Real time Interview question. Refer code for more info

74. What is Implicit wait? Explain with real time scenario

- 1) applied global level
- 2) Dynamic wait

Important interview question Difference between implicit and explicit wait. Refer official documentation for more info.(selenium dev)
Syntax: driver.manage().timeouts().implicitlyWait(30, TimeUnit.SECONDS);

As per Rahul
Implicit wait

Pros:

- 1) Global level
- 2) Clean code

Cons:

Performance defect cannot be identified. Eg: Consider there is a requirement stating a specific element in the application must be loaded in some seconds. Applying implicit wait will apply in global level and this perf defect cannot be identified.

Explicit wait:

```
WebElement firstResult = new WebDriverWait(driver, Duration.ofSeconds(10)).until(ExpectedConditions.elementToBeClickable(By.xpath("//a/h3"))))
```

- 1) No performance issues

Cons: 1) More code

Interview question: which wait strategy is best. Implicit or explicit wait. Note: As per official documentation it is given not to mix implicit and explicit wait. Please read it more about it.

Naveen automation notes:

Implicit Wait: • During Implicit wait if the Web Driver cannot find it immediately because of its availability, it will keep polling the DOM to get the element. • If the element is not available within the specified Time an NoSuchElementException will be raised. • The default setting is zero. • Once we set a time, the Web Driver waits for the period of the WebDriver object instance.

Explicit Wait: •There can be instance when a particular element takes more than a minute to load. •In that case you definitely not like to set a huge time to Implicit wait, as if you do this your browser will going to wait for the same time for every element. •To avoid that situation you can simply put a separate time on the required element only. •By following this your browser implicit wait time would be short for every element and it would be large for specific element.

Implicit wait is applied at global level and dynamoic in nature.It can be changed anywhere and anytime in code

Explicit wait

Specific to element .Dynamic.We should never use implicit and explicit wait together.Selenium WD will wait for the element first due to implicit wait and then EXPLICIT wait will be applied

Naveen also customised method for send key and click with explicit wait used inside the method for reusability.le the method is passed with webelement for wait opeartion on expected conditions

<http://makeseleniumeasy.com/2017/07/02/part-6-waits-in-selenium-what-happens-when-we-mix-implicit-wait-and-explicit-wait/>

Under Explicit wait

- 1)WebDriverwait-Keeps on monitoring every 500 ms
- 2)Fluent wait-We will set the monitoring frequency.it will repeatedly poll at regular interval set.

Fluent wait,WebDriverwait is a class which implements wait interface ..similarly chromedriver(),edgedriver is a class which implements WebDriver interface

Fluent wait syntax

```
Wait wait = new FluentWait<WebDriver>(driver)
    .withTimeout(Duration.ofSeconds(SECONDS))
    .pollingEvery(Duration.ofSeconds(SECONDS))
    .ignoring(NoSuchElementException.class);
```

```
WebElement clickseleiumlink = wait.until(new Function<WebDriver, WebElement>(){
```

```
    public WebElement apply(WebDriver driver ) {
        return driver.findElement(By.xpath("/html/body/div[1]/section/div[2]/div/div[1]/div/div[1]/div/div/div[2]/div[2]/div/div/div/div[1]/div/div/a/i"));
    }
});
```

Example when to use fluent wait.

Your card is accepted(3)->Your order being processed(7)->confirmation

Let's consider a scenario where an element is loaded at different intervals of time. The element might load within 10 seconds, 20 seconds or even more then that if we declare an explicit wait of 20 seconds. It will wait till the specified time before throwing an exception. In such scenarios, the fluent wait is the ideal wait to use as this will try to find the element at different frequency until it finds it or the final timer runs out

Fluent wait finds the element repeatedly at regular intervals of time until the timeout or till the object found

Unlike webdriverwait we need to built custom wait methods based on condition(example:visibilityofelementlocatedby() such method not available in fluent wait)

- Handling Ajax/Mouse Interactions

Action class

- 1)Context click(WebElement) -right click.Important interview question.
Create an object of actions class by passing webdriver instance and construct the action.Build and perform it.

Note:While debugging in eclipse use watch to see the expression in runtime .Put a debugger point and play around with watch

```
Actions builder = new Actions(driver);
Action seriesOfActions = builder
    .moveToElement(txtUsername)
    .click()
    .keyDown(txtUsername, Keys.SHIFT)
    .sendKeys(txtUsername, "hello")
    .keyUp(txtUsername, Keys.SHIFT)
    .doubleClick(txtUsername)
    .contextClick()
    .build();
```

```
seriesOfActions.perform();
```

Mouse Actions in Selenium:

doubleClick(): Performs double click on the element

clickAndHold(): Performs long click on the mouse without releasing it

dragAndDrop(): Drags the element from one point and drops to another

moveToElement(): Shifts the mouse pointer to the center of the element

contextClick(): Performs right-click on the mouse

Frame

Switch to frame can happen by webelement ,frameid,frameindex.

- driver.switchTo().frame(0);
Once done with inside frame switch back to defaultcontent

Section 11:Real time exercise:

- 1)Count of link present in page(use findelement by tag name of anchor tag
- 2)Count of link present in footer section-limiting webdriver scope.apply findelement to a webelement variable.
- 3)count of ink present in footer section first column same as step 2
- 4)click links returned on step 3 and retrieve the title of the page.(1 method is to click the link and navigate back but it takes time.

The optimised solution is to use keys.chord(control+enter) and iterate windows opened by links..Can tell the same when question is asked in interview what special you did in automation

Refer 94. Code for Exercises

Staleelement exception-<https://www.tutorialspoint.com/how-to-resolve-stale-element-reference-exception-in-selenium-webdriver>

Calendar 95. Handling calendar UI in Travel websites

1) grab the common locator attribute and iterate and select the date and month

Note: Use Calendar.getInstance().get(Calendar.YEAR) for getting current year when year also needs to be selected

Why javascriptExecutor?

javasCriptExecutor is an Interface that helps to execute JavaScript through Selenium Webdriver. JavaScriptExecutor is used when Selenium Webdriver fails to click on any element due to some issue.

99. How to Perform Scrolling with in table and Window level using

Use javascriptexecutor for Window scroll and element scroll. We can verify it via browser developer console

Eg:

```
js.executeScript("window.scrollBy(0,700)");//window scroll  
js.executeScript("document.querySelector('.tableFixHead').scrollTop=200");//element scroll
```

JavaScriptexecutor can also be used for sendkeys ,click and gettext

```
SendKeys----->js.executeScript("document.getElementById('name').value='hello';");  
Click ----->js.executeScript("arguments[0].click()", alertButton);  
Gettext----->js.executeScript("return document.getElementById('checkboxOption1').value").toString()
```

105. SSL certifications code -This code is all about setting desired capability and chromeoptions for accepting invalid site certifications. New content added in tutorial
options.setAcceptInsecureCerts(true)

106. Maximizing window and deleting cookies-probable interview question.How to delete session cookies ad verify application logedout.

```
Driver.manage().deleteCookieNamed("somethinglikesessioncookie");
```

How to take screenshot:

Import apache commonio utils package using maven

```
TakesScreenshot sshot=(TakesScreenshot)driver;  
File src=sshot.getScreenshotAs(OutputType.FILE);  
String location="C:\\Users\\kkrid\\Downloads\\text.png";  
File des=new File(location);  
FileUtils.copyFile(src, des);
```

Broken link:

1) Create HttpURLConnection object and invoke openconnection method. Set request method-->connect-->response code

```
HttpURLConnection hul=(HttpURLConnection)new URL(url).openConnection();  
hul.setRequestMethod("HEAD");  
hul.connect();  
int response=hul.getResponseCode();
```

Softassertion-When using assertions if the assertion fails then exception is thrown and remaining steps are not executed.TO avoid this soft assertions is used

Syntax of soft assertions.

SoftAssert softAssert = new SoftAssert(); At last assert all method needs to be invoked

Java Streams

Steps

1) Convert into stream object

2) Use transform method(here filter()) and create intermediate stream and terminal method(here count())

names.stream().filter(s->s.startsWith("A")).count(); -->Return type of this is count method is long

instead of initialising the collection and applying stream you can directly initialise like

```
Stream.of("Ajay", "Aleksa").filter(s->s.startsWith("A")).count();
```

Terminal operation will only execute if the intermediate operations returns true.

There is no life in intermediate operation when there is no terminal operation

Note: Streams will do parallel execution and hence the optimised and regular for loop will do sequential iterations.

```
names.stream().filter(s->s.length()>4).foreach(s->System.out.println(s));
```

```
names.stream().filter(s->s.length()>4).limit(1).foreach(s->System.out.println(s));
```

```
names.stream().filter(s->s.length()>4).map(s->s.toUpperCase()).foreach(s->System.out.println(s));
```

can also use sorted method for sorting

```
names.stream().filter(s->s.length()>4).sorted().map(s->s.toUpperCase()).foreach(s->System.out.println(s));
```

merge two list and perform sorting.use concat(list1.stream(),list2.stream())

anymatch

```
names.stream().filter(s->s.length()>4).sorted().map(s->s.toUpperCase).collect(Collectors.toList())
```

For generating random number stream

```
Random rand=new Random();
Rand.int().follow by the pipeline aggregate operations
```

```
IntSummaryStatistics summary= integers.stream().mapToInt(s->s).summaryStatistics();
System.out.println(summary.getMax());
```

To convert arrays into list

```
List<Integer> integers = Arrays.asList(3, 2, 2, 3, 7, 3, 5);
```

Refer here:https://www.tutorialspoint.com/java8/java8_streams.htm

Refer code section of Selenium java streams for complete understanding

Compare sorting of column is working

Get price of one item using custom steam method

Pagination

Verify filter working

Selenium grid advantages -Revist videos

1)distributed test execution

2)parallel execution

Selenium 4 features:

1)Relative locators also called as friendly locators:

```
above
below
toLeftOf
toRightOf
near
```

The findElement method accepts a new method with(By) which returns a RelativeLocator. Users can pick a locator of their choice like By.id, By.cssSelector, etc

Import this package as it not imported as suggestion since of static class

```
Import static.org.openqa.selenium.support.locators.RelativeLocator.with;
```

Eg:

```
System.out.println(driver.findElement(with(By.tagName("label")).above(element)).getText());
```

Note:Relative locators does not work with flex components

Invoke multiple windows or tabs using selenium4. Note:This is different from handling multiple windows and invoking multiple windows

```
driver.switchTo().newWindow(WindowType.TAB); //can also use WindowType.Window to invoke new window.
```

After invoking new window you need to follow the procedure of handling multiple windows ie Set<String> windows=driver.getWindowHandles(); switch and perform required operation

Partial screenshot/Webelement screenshot where nameField is webelement in below example

```
File src=nameField.getScreenshotAs(OutputType.FILE);
FileUtils.copyFile(src, new File("1.png"));
```

Getting width and height of webelement(getRect() method)

```
System.out.println("Height "+nameField.getRect().getHeight()+"\n"+Width "+nameField.getRect().getWidth());
```

TestNG

Can be installed in eclipse from eclipse market place->search for TestNG and install

Testing xml schema suite->test folder(collection)->Test methods

Real time example->Test folder for different types of loans->Personal loan ,home loan,Education loan etc..

To create testing xml file right click on project and convert it into testing class

Regex in testing xml

```
<class name="com.javatpoint.exclude">
<methods>
<exclude name="employee.*"/> (Notice dot star to be used for regex)
</methods>
```

Can directly run package level tc using xml file

```
<Suite>
<test>
  <packages>
    <package name />
    </packages>
  </test>
</suite>
```

Before Test /after test annotation is applicable to one test xml block defined in testng xml file. Common example of beforetest annotation can be used where we need to delete the test data to start execution

Note:Observed on own ->If a Test block in xml has multiple classes and each class file has Beforetest annotation then the beforetest method will be executed in alphabetical order of class name

BeforeMethod /AfterMethod will be in perspective of class file not on xml file.It will be executed before or after every test method in class file.Practical example would be to delete cookiecache before test method execution.

Another annotation->Before class, beforeGroups

BeforeClass and Before Methods are class level scope. Interview question:Diff between BeforeTest and BeforeMethod

Scenario:We have 100 tc and client want us to execute only 30 of it.How to achieve it.-->This can be achieved via groups.

Groups will execute only the method with group annotation but not the beforetest/after test methods etc..Groups can be defined in suite level scope or test block level scope

Syntax

```
<test>
  <groups>
    <run>
      <include name="">
    </run>
  </groups>
```

We can include or exclude specific test methods in a class file like

```
<class name="Test.PersonalLoan">
  <methods>
    <include name="TestName"></include>
  </methods>
</class>
```

Annotation helper attribute

@Test(dependsOnMethod={"AnotherMethod"})-can also add multiple tcs .We can depend on only methods belonging to same class file

2)@Test(enabled=false) -to skip a tc execution.This is useful when we want to skip a functionality in which bug is already reported and we dont want to execute it.Famous interview question enabled=true will turn on.

3)@test(timeout=4000).Dont fail the method till the timeout duration. Helpful in scenario when we know that server may take time to respond and we don't want to increase the implicit wait since it impact performances.Timeout is applied can be applied at suite level in testng file or method level.If the execution of method is not completed within the timeout duration then tc will be marked fail.

Parameterising from TestNG xml file. parameter can be defined in suite level, testlevel scope

```
<Parameter name="URL" value=""google.com"" /> (Can be used in suite level or test level scope)
```

To use in test method(catch it in a method argument)

```
@parameter({"URL"}) (Can also use multiple parameters)
@Test
public void testMethod(String urlname){
Syso(urlname);
```

Note:Cross browser testing can also be done using parameters <https://www.guru99.com/cross-browser-testing-using-selenium.html>

Data provider is independent of xml file to declare it.Create an object array and store the data values

TO declare it:

```
@Dataprovider
public Object[][] getdata(){
Object [][] data=new Object[3][2];
}
```

At test method

```
@Test(dataprovider="getdata")
public void testMethod(String username,String password)
```

Famous interview question:

How to achieve parameterisation in TestNg

- 1)using data provider annotation
- 2)Using parameters from testng xml file

Note:If there are any dependencies from XML file run it as xml testng suite only not as individual testng class

Dataprovider will run the same test with different data inputs

Listeners

ITestListener interface needs to be implemented by class defining interface methods

Once implemented add the info in xml file.This info needs to be declared in suite level.Common example when to use listener :suppose you need to take screenshot when test failed.

Syntax:

```
<Suite>
<listeners>
    <listener class name="" />
</listeners>
</Suite>
```

Retry failed methods using TestNG(learned via naveen youtube. code:<https://github.com/naveenanimation20/RetryLogicTestNG>)
1)manual-Testng-failed xml

2)Automated-can be applied at two level.
1)Individual test level
2)Overall testng xml level

Steps: Implement the interface of IRetryAnalyzer and write the retry logic by overriding retry method

If need to implement at test level

```
@Test(retryAnalyzer = retryAnalyzer(customeclass).class)
```

Implement IAnnotationTransformer interface and override

```
public void transform(ITestAnnotation annotation, Class testClass, Constructor testConstructor, Method testMethod) {
    // TODO Auto-generated method stub
    annotation.setRetryAnalyzer(Retry.RetryAnalyzer.class);
}
```

To get method name which is getting failed use result.getName().Result object belongs to ITestResult class

interview question how to get the name of method which is failing using listener

Parallel execution-Generally not suggested as it leads to performance issue

```
<Suite parallel="tests" thread-count="2">
```

As per Rahul testng parallel execution is fine for web automation but does not make sense in mobile automation since we need multiple emulators. He suggested to go with Grid for parallel execution

Can also use to run classes parallel by syntax
<test parallel="classes" thread-count="2">

Note: In testng xml if both groups AND method name include in class is there then only groups methods will be triggered

Global values using properties file

Create a file with .properties extension

Add the properties in key value pair without quotes

```
Properties prop=new Properties();
FileInputStream fis=new FileInputStream(filepath);
prop.load(fis);
sys(prop.getProperty("Propertyname"))
```

To change the property in Run time

```
prop.setProperty("propertyname", "Propertypvalue")
```

To write the changed property back to property file

```
FileOutputStream() fos=new FileOutputStream();
prop.store(fos,"somedata-can also be null")
```

On properties file define the key and value. Note the value should not be in double quotes

Maven(<https://maven.apache.org/guides/getting-started/maven-in-five-minutes.html>)

Apache Maven is a software project management and build management tool for Java Frameworks. (Java Framework refers to frameworks implemented using java-eg:selenium, Appium)

Why Maven?(Interview question)

Central repository to get dependencies-Removes setting up of build path manually in every system in case multiple people working in a project

Maintaining common structure across the organization-project skeleton eg src->main and test in project

Flexibility in Integrating with CI tools

Plugins for Test framework execution.

How to install maven

Download the zip from maven website. Put the extracted file in some drive. Go to Environment variables of control panel. Add the system variable of MAVEN_HOME and file location till maven home folder. Next step double click path variable and new->add till bin folder location.

Verify installation by mvn --version

Maven Project structure:

Src/main/Java src/test /java ,src/main/resource ,src/test/resource

Maven Terminology

->GroupId- identify project uniquely

->ArtifactId-Is a file.jar that gets deployed into maven repo

sureFirePlugin->To execute test case in maven project(Interview question)

Maven commands

Clean

Compile

Test will automatically clean and compile

.m2 folder will have all dependencies used in maven. Mvn test will first check the existing of jars in .m2 local folder. If not then it will make a call to maven repository

Class name must have Test keyword so that surefire plugin treat as test class

Integration

Refer <https://maven.apache.org/surefire/maven-surefire-plugin/examples/testng.html> -> Using Suite XML Files for info

Syntax

```
<plugin>
  <groupId>org.apache.maven.plugins</groupId>
  <artifactId>maven-surefire-plugin</artifactId>
  <version>3.0.0-M5</version>
  <configuration>
    <suiteXmlFiles>
      <suiteXmlFile>testng.xml</suiteXmlFile>
    </suiteXmlFiles>
  </configuration>
</plugin>
```

To run single test class using maven

```
mvn -Dtest=TestClassname test Replace TestClassName with your test class name
```

While creating maven project Artifact id will be the project name

Profiling in maven:

You can have multiple testng xml file and point that file in pom.xml via profiling. In this way avoid each time to change xml file. This is when we need to execute smoke test alone or regression alone.

To trigger profiling tc via maven the command is mvn test -P profileid

```
Syntax
<profiles>
  <profile>
    <id>Regression</id>
    <build>
      <plugins>
        <plugin>
          <groupId>org.apache.maven.plugins</groupId>
          <artifactId>maven-compiler-plugin</artifactId>
          <version>3.8.1</version>
          <configuration>
            <source>1.8</source>
            <target>1.8</target>
          </configuration>
        </plugin>
        <plugin>
          <groupId>org.apache.maven.plugins</groupId>
          <artifactId>maven-surefire-plugin</artifactId>
          <version>3.0.0-M5</version>
          <configuration>
            <suiteXmlFiles>
              <suiteXmlFile>testng.xml
            </suiteXmlFile>
          </suiteXmlFiles>
        </configuration>
      </plugin>
    </plugins>
  </build>
</profile>
</profiles>
```

Jenkins:

Username: admin

Pass: f60666fc8db4c349434a56cae22d234

Jenkins is continuous integration tool

Download jenkins(WAR file)->Put it in a drive->GO to that drive->cmd

Command java -jar jenkins.war -httpPort=8080 or(9090)

Hit url :localhost:9090 (In real time project Jenkins would be hosted)

Manage Jenkins->Global tool config->Copy the path of JDK from local and paste it and do the same for maven

Directory-Put source code into jenkins directory and use path \${JENKINS_HOME}/projectname

Create new job->Free style project->

Click advanced->use custom workspace directory name->\${JENKINS_HOME}/projectname.GO to build->Add build step->Invoke top level maven target and use maven command to be

executed.

In this case since we are using profiling type "test -P Regression".click on build now .

To integrate TestNG reporting in jenkins.(After maven test ,you might have a report in target->surefire reports->index.html.

Note:There is a xml file which have tesng results for reference

To configure in jenkin-Install testng results plugin->Go to job config->Add post build steps ->Publish testng results and click save.If you notice the xml file which we told above is referenced automatically.

Build the job again.You will find the Testng results.

To schedule a jenkin job we need to select build periodically <https://www.lenar.io/jenkins-schedule-build-periodically/>

Extent Reports

Two important class ExtentReports ,ExtentSparkReporter

Use System.getProperty("user.dir") -to dynamically fetch project directory

Extent spark reporter object.config().setReportename("")->SetDocument tile

Extentreport object Attachreporter(object of extent spark report)

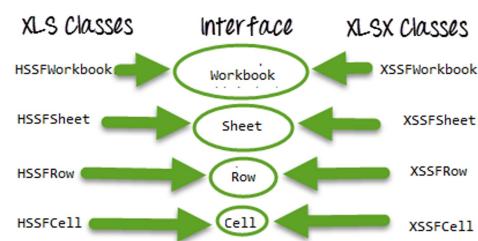
Extent.setSystemInfo();

Extent.create(),extent.flush

Refer code :170. Code Download

Data Driven using excel:

Data-driven is a test automation framework which stores test data in a table or spread spreadsheet format.



Common interview question:How can you drive data from excel in your framework-Answer:Using Apache POI API(POI and POI ooxml

Note:We can also create maven project via cmd.Read later:<http://websystique.com/maven/create-a-maven-project-with-commandline/>

Read later <https://www.guru99.com/all-about-excel-in-selenium-poi-jxl.html>

Refer :178. Code download

Use NumberToTextConverter.toText(c.getNumericCellValue()); where c is cell object

Apache log 4

Fast and flexible logging framework

Log4j May be useful in following scenarios

1)Log only error for package A testcase

2)Log The entire logs for package B tc

3)Log with Timestamp.Log file of lastweek

Use Log.Debug() When each Selenium action is performed like click, SendKeys, getText()

Use log.info() When operation is successfully completed ex: After loading page, or after any successful validations

Use log.Error() to log when elements are not displayed in the page or if any validations fail

Usage

```
Logger log=LogManager.getLogger(ExtentReportSample.class.getName()); where ExtentReportSample is classname  
https://logging.apache.org/log4j/2.x/manual/configuration.html
```

To get the log 4j dependency visit <https://logging.apache.org/log4j/2.2/maven-artifacts.html>
To print all logs change Root level="trace"

Appenders and loggers

Where to log -Appenders
How to log-Appenders
What to log-Loggers

Download the maven dependencies from <https://logging.apache.org/log4j/2.x/maven-artifacts.html>

By default log 4j will only log error and fatal logs.it does not log info and debug logs.TO print all logs we need to configure via an xml file.

Create an xmle file in separate folder/package. Link the package in project build path via sources.

```
Log4J xml fil  
<?xml version="1.0" encoding="UTF-8"?>  
<Configuration status="WARN">  
    <Appenders>  
        <Console name="Console" target="SYSTEM_OUT">  
            <PatternLayout  
                pattern="%d{HH:mm:ss.SSS} [%t] %-5level %logger{36} - %msg%n" />  
        </Console>  
    </Appenders>  
    <Loggers>  
        <Logger name="Beta.betaClass" level="error" additivity="false">  
            <AppenderRef ref="Console" />  
        </Logger>  
        <Root level="trace">  
            <AppenderRef ref="Console" />  
        </Root>  
    </Loggers>  
</Configuration>
```

additivity="false" is used to avoid repetition

Final Log 4j conf file

```
<?xml version="1.0" encoding="UTF-8"?>  
<Configuration status="WARN">  
    <!-- basepath takes path till folder root .here./Logs is a package and inside it ,a log file is present -->  
    <Properties>  
        <Property name="basePath">./Logs</Property>  
    </Properties>  
  
    <Appenders>  
        <!--SizeBasedTriggeringPolicy tag is used when the size of the file extends 500 kb a new file is created by the name as given in filepattern -->  
        <RollingFile name="File" fileName="${basePath}/test.log" filePattern="${basePath}/prints-%d{yyyy-MM-dd}.log">  
            <PatternLayout pattern="%d{HH:mm:ss.SSS} [%t] %-5level %logger{36} - %msg%n"/>  
            <SizeBasedTriggeringPolicy size="500" />  
        </RollingFile>  
  
        <Console name="Console" target="SYSTEM_OUT">  
            <PatternLayout  
                pattern="%d{HH:mm:ss.SSS} [%t] %-5level %logger{36} - %msg%n" />  
        </Console>  
    </Appenders>  
    <Loggers>  
        <Logger name="Beta.betaClass" level="error" additivity="false"><!-- additivity false is used to avoid repetition .It Gets or sets a value indicating if child loggers inherit their parent's appenders -->  
            <AppenderRef ref="File" /><!-- Appender ref is given as file so it will be printed in file -->  
        </Logger>  
        <Root level="trace">  
            <AppenderRef ref="Console" /><!-- Appender ref is given as console so it will be printed in console -->  
        </Root>  
    </Loggers>  
</Configuration>
```

Add this in pom.xml for automatically pointing log4jxml file in maven.This is added inside build tag and out of plugin

```
<resources>  
    <resource>  
        <directory>src/main/resources</directory>  
        <filtering>true</filtering>  
    </resource>  
</resources>
```

Page object model:

Easy to maintain
Easy Readability of scripts
Reduce /eliminates duplicacy
Reusability

Refer:195. page object Code download

Usage:Define a class for a page and place all objects associated with that page inside it

Can use a By variable also to store an object.

Eg

```
WebDriver driver;
public AmazonHome(WebDriver driver) {
    this.driver=driver;
}

By searchBox=By.xpath("//*[@id='twotabsearchtextbox']");
By goButton=By.id("nav-search-submit-button");

public WebElement SearchBoxInput() {
    return driver.findElement(searchBox);
}

public WebElement submit() {
    return driver.findElement(goButton);
}
```

PageFactory use findBy annotations and initialise the pageFactory with initElements(driver ,thins)
ie,PageFactory.initElements(driver, this);

```
WebDriver driver;
public Resultspage(WebDriver driver) {
    // TODO Auto-generated constructor stub
    PageFactory.initElements(driver, this);
}

@FindBy(xpath = "//*[@class='a-section a-spacing-none']/h2/a/span")
WebElement firstResult;

public WebElement resultList() {
    return firstResult;
}
```

Selenium 4 features

Chromium driver class has predefined methods to access dev tools

Chrome Driver and Edge driver are inherited from edge driver so we can access dev tool from edge and chrome browser.

FYI: In past all browser driver were inheriting from remoteWebDriver class

ChromeDevToolProtocol will send/invoke devtools

Selenium has wrapper which it self invokes real cdp methods.

When wrapped in option tag the method params can be optional. Pass the argument as Optional.empty() while calling method

Here, we cannot get the dev tools using the WebDriver instance. Either, we need to cast the WebDriver object to ChromeDriver using ((ChromeDriver) driver).getDevTools() or create a ChromeDriver object.

```
ChromeDriver driver = new ChromeDriver();

DevTools devTools = driver.getDevTools();

devTools.createSession();

//send command to CDP Methods-> CDP Methods will invoke and get access to chrome dev tools
devTools.send());
```

Selenium guys have designed a wrapper class which would be same as domain given in chromedevprotocol documentation :<https://chromedevtools.github.io/devtools-protocol/>

Select wrapper methods based on browser version eg: when typed Emulation. Eclipse will suggest multiple methods.select based on browser version.-Need to verify running locally

(sendcommand)

WebDriver code----->Selenium server interprets commands---->ChromeDevTools protocol---->Mimic the behaviour of browser
-----|||executeCDP command

To directly execute command

```
driver.executeCdpCommand("Emulation.setDeviceMetricsOverride", mp); where mp is object of hashmap<String, Object>
```

Localisation testing using geolocators refer code

Can also be used in two ways ,ie either using wrapper class or directly executing cdp commands

Use console log printing in testfailure method of listener

Device emulator Emulation.setDeviceMetricsOverride

```
CDP commands-driver.executeCdpCommand("Emulation.setDeviceMetricsOverride", deviceMetrics); where second argument ie deviceMetrics is map of <String, objects>
```

Set geoLocation -Emulation.setGeolocationOverride

Edit request url->fetch enable, listener->requestpaused and change the URL and continue request

Failed request->fetch enable,listener->request paused and failrequest

LogNetworkActivity ->network enable,listener->Requestwillbesent,listener->response received

BlockedURL->Network enable, setblocked url

Network speed-Networ enable->emulate networkcondition can also be used along with listener loadingFailed

Basic auth-

```
Predicate<URI> uriPredicate =uri -> uri.getHost().contains("httpbin.org");

((HasAuthentication)driver).register(uriPredicate, UsernameAndPassword.of("foo", "bar"));
driver.get("http://httpbin.org/basic-auth/foo/bar");
```

Console logs

```
LogEntries entry= driver.manage().logs().get(LogType.BROWSER); //Get LogEntries object
List<LogEntry> logs = entry.getAll(); //LogEntry object- getAll method return all logs in list

for(LogEntry e : logs)//iterating through list and printing each log message
{
    System.out.println(e.getMessage()); //Log4j
}
```

Set device overrider-Emulator

Set location specific -Emulator

Fail network request-Fetch

Network log request and response details-Network

Network mock url-Fetch

Network speed-Network

Blocked request(e.g.css,jpg)-Network

Capture console-driver.manage.logs();

Basic authentication :Example above

Fetch domain:A domain for letting clients substitute browser's network layer with client code.

Framework

Component in framework

1) TestData(Dont hardcode, drive data from excel-Apache poi)

2) Reporting and log-

3) Utilities-common utilities for reusability(common method-screenshot,wait explicit).These utilities are project utility.

4) Unit test framework-TestNG.We are generating tstscript using design pattern page object model

5) Build tool-Maven-project dependencies and run our test

6) Runner-Jenkins -ci server or selenium grid

7) Version control-GitHub

Explain more then individually explain each components

1) TestData-properties file,Excel ,Dataprovider

2) Reporting-ExtentReport

Difference between modular driven vs data driven vs hybrid framework

Note:It is best approach to use dataprovider with excel read.That is the data for dataprovider must be fetched from excel file in code.

Data driven framework-<https://www.tutorialspoint.com/explain-data-driven-framework>

Modular driven framwork-<https://www.tutorialspoint.com/explain-modular-automation-framework>

Framework what is it?

A framework defines a set of rules or best practices which we can follow in a systematic way to achieve the desired results.

OOPS concept in automation framework <https://www.softwaretestingmaterial.com/oops-concept-in-automation-framework/>

E2E frame work implementation

Ask framework question from mentor@rahushettyacademy.com ,rahulonlinetutor@gmail.com

Use this to fetch driver object from ITestResult variable in listeners
driver = (WebDriver) result.getTestClass().getRealClass().getDeclaredField("driver")
.get(result.getInstance())

To make the ThreadSafe in ExtentTest object in listener

```
ThreadLocal<ExtentTest> extentTest=new ThreadLocal<ExtentTest>();  
extentTest.set(test);  
extentTest.get()
```

How to parameterise jenkin build.

Suppose consider the management want to execute the result in another brower.They cannot change the browser property and check in the code.Hence we need to pass the variable via mvn commands

Use system.setProperty("browser") in code to assign value which is passed via mvn test command

test -Dbrowser=chrome where -D stand for parameter

In Jenking go to configure project->this project is parameterised.->choice parameter-> name as browser and choices as chrome ,firefox(one by one without period or comma) and in invoke top level maven commands type test -Dbrowser="\$browser" where \$browser is a jenking variable defined in parameter. Browser will be shown as dropdown selection during build trigger in jenkin

Interview question:How did you achieve encapsulation in framework

1)By defining the variables as private and accessing methods as public ,encapsulation is achieved

JDBC connection

1)Set the maven dependency [MySQL Connector/J](#)
2)

- Register the Driver class
- Create connection
- Create statement
- Execute queries
- Close connection

```
Class.forName("com.mysql.jdbc.Driver");  
Connection con=DriverManager.getConnection("jdbc:mysql://localhost:3306/qadb","root","root");  
Statement s=con.createStatement();  
ResultSet result=s.executeQuery("select * from employee where empid=100");  
while(result.next())  
    System.out.println(result.getString("empname")+" "+result.getString("address"));  
}
```

Result set lies in 1 st index hence next is used

Saucelabs -It is cloud vendor where we can run our automation scripts

The expectation of infrastructure is set as desired capability.The capability code can be auto generated via platform configuration website of saucelab.

Ran using remoteWebDriver;Code for reference 341. code download

BDD

Defined in ubiquitous language so that all people of project are able to understand.

Ubiquitous language syntax

In order to (Achieve something)-->Business outcome

As a (role)

I want to (do this)

Example:

In order to pay credit card payment

As a Netbanking sole owner who have credit card section access

I want to Navigate to credit card section and enter amount and process my payment

Testcase syntax:

Given:(What you need to perform action)->prerequisites
When:(performs action)-Action
Then:(the desired outcome for the user)-validation

Example:

Given:AN account with zero balance
When:I navigate to credit card section and click on submit by giving amount
Then :It should throw some error message

Advantages of BDD

- 1)This can be used as standard template where all qa engineers can stick to common standard of designining testcases
- 2)Each scenario reflects a business value
- 3)We can estimate the test coverage happened for each business outcome by going through test cases
- 4)We can tag the bdd annotation with selenium
- 5)Common standard testcase template for both manual and Automation team

Cucumber eclipse-Download cucumber plugin from eclipse marketplace.(This plugin is required for identifying syntax error in jherkin language).Also install natural editor for bdd

Create maven project->dependencies required:Cucumber java and cucumber junit

Feature file-contains test case
Step definition file: Automation code
TestRunner(Junit)

Note:Features file need to be created inside test/java since cucumber is template sensitive

File name should be .feature extension

Use TidyGherkin chrome plugin to generate the mapping code

Note:While mapping feature file with test runner give the path till package to execute all feature file inside package.If need to execute single feature file give path till the feature file

Stepdefinition linking .ie glue The package should have same parent

Suppose in case tidyGherkin plugin is not available we can also generate the mapping using eclipse.Run the testrunner file the console will list the mapping.

If we need to achieve parameterisation in cucumber feature file use the keyword:scenario outline.Refer code for implementation

For cucumber testing integration download maven dependency cucumber testing.

Remove runwith Junit annotation and extends AbstractTestngCucumber test(class form official documentation)

Git and GitHub

We have plugin where all git commands can be triggered via UI .The plugins such as Tortoise Git,IntelliJ,Eclipse git plugin

Refer atlassian basic git commands website for more info :<https://confluence.atlassian.com/bitbucketserver/basic-git-commands-776639767.html>

Create a repository manually in github

Step1)Go to the folder and initialise it by git init
Step 2)Add the code to staging by command git add /*(used for including all file ,else use git add <filename>)
Step 3)Commit the staging by git commit -m "message"
Step 4)Set the pointing to remote repository using
git remote add origin <https://github.com/kiranji/GitDemo.git>(The origin link is available in github)

Step 5 :Push the code git push origin master

GitHub username:k.k.rider97@gmail.com Kiranji@123

Steps to clone a repo:

1)First time we need to clone it afterwards we can use pull command
Command git clone <https://github.com/kiranji/GitDemo.git>
If we need to pull the latest then use git pull origin master

Branch

TO create a new branch git checkout -b develop(branch name)

TO know which branch we are in git branch

To switch branch git checkout develop

TO merge branch :git merge develop

Learned from youtube:

TO remove a file from staging area:git rm --cached <filename>
When we need to restore to previous commit use git checkout commitid(contradicts with below revert definition .Hence omit this statement)
TO return to master head use git checkout master

To delete a branch git branch -d branchname

TO checkout to last commit use command= git checkout .(dot)

To reset the last commit or to go to commit by commit id use command git reset --hard commit id

Git Commit without Stage git commit -a -m "Updated index.html with a new line"

Difference between git pull vs git fetch

Git fetch-Get the lastest code in local repo from remote but does not update working directory.After reviewing can be updated in working directory with git merge command
Git pull-Get the latest code and update the local and working directory as well.

Git pull=Git fetch+git merger

Difference between rebase vs merge

<https://www.perforce.com/blog/vcs/git-rebase-vs-git-merge-which-better>

Git rebase compresses all the changes into a single "patch." Then it integrates the patch onto the target branch. Unlike merging, rebasing flattens history. It transfers the completed work from one branch to another. In the process, unwanted history is eliminated.

Git rebase and merge both integrate changes from one branch into another. Where they differ is how it's done. Git rebase moves a feature branch into a master. Git merge adds a new commit, preserving the history.

What is conflict and when it occurs:

Git can handle most merges on its own with automatic merging features. A conflict arises when two separate branches have made edits to the same line in a file, or when a file has been deleted in one branch but edited in the other. Conflicts will most likely happen when working in a team environment.

Use this for [Git Tutorial 1: What is git / What is version control system?](#)

Difference between git revert checkout and reset.

Checkout is used to undo the changes before commit.

Revert can be used for undo after commit

Reset- deleted the commit and history also

Usage:

Git checkout --filename

Git revert comitid(commits automatically)

Git revert -n comitid(Does not commit automatically)

Git reset -- hard comitid

Tracked files are files that GIT knows about it.Untracked files are everything else.

Git vs Github:

Git is a software in version control system used for tracking changes in source code during software development.Installed locally on system.Maintained by linux

Github is a web based repository hosting service.It is a service.Maintained by microsoft.

Git hub(Kunal)

Touch filename :to create a file in linux based terminal (or git bash)

Cat filename to display contents of file

Git init

Git status

Git restore --staged filename =TO remove a staged file

Git log

Git stash -to stash the changes

Git stash pop

Git stash list -to list the stash changes

Git stash clear

Git reset commit id-->all the commit bove this commit id will be moved to unstaged area

Note:one branch can have only pull request. Example a commit is made and pull request is raised. On subsequent commit the pull request also will have the recent commit.Then it is challenging for reviewer to review the code

Git pull upstream master

Git squash :To "squash" in Git means to combine multiple commits into one.

Command for git squash: git rebase -i commit id

It will open iterative edior.change pick to squah to combine commits into one

Basic windows based authentication using selenium

In url use in this format <http://username:password@siteURL> ie) driver.get(<http://admin:admin@the-internet.herokuapp.com/>)

AutoIt to handle file upload.

1)Write the AutoIt script:

2)Go to program file(x86)-Auto It folder/scite/open editor application.

3)Use this code,here the location of window console element can be find via finder tool which is available in autoit folder.Control id is combination of Class+instance

ControlFocus("Open","","Edit1")

ControlSetText("Open","","Edit1","C:\Users\kkrid\Downloads\petition 6 Dec 2021-compressed.pdf")

ControlClick("Open","","Button1")

4)Save it .The default extenion would be .au3.Now compile it by right clik as change it into .exe file

5)To use it in code Runtime.getRuntime().exec("C:\\Users\\kkrid\\Downloads\\autoit.exe");

In other words

Au3info- record window component objects

Build Script -scite.exe

Save it- .au3 extenstion

Convert file into .exe by compiling .au3 file

Call .exe file with Runtime class in java into your selenium tests

To verify a file is downloaded use file exist method.But the challenge is to change the default download directory using chrome options and set it inside project directory.

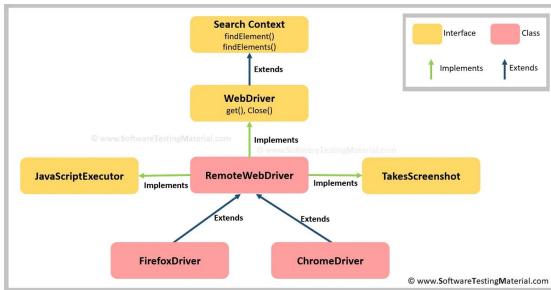
```

Refer code:350. Full Code download
ChromeOptions options=new ChromeOptions();

options.setExperimentalOption("prefs", chromePrefs);

```

Why Webdriver instance is used instead of chromedriver ?<https://www.softwaretestingmaterial.com/webdriver-driver-new-firefoxdriver/>



Common exception in selenium:<https://www.browserstack.com/guide/exceptions-in-selenium-webdriver>

Agile methodology

Agile=Iterative and incremental

Jira Url:<https://jirakiranji.atlassian.net/jira/your-work> Kiranji@123

Scrum team

- 1)Scrum master
- 2)Product owner
- 3)Dev team
- 4)QA team

Note:The dev manager and qa manager are not involved in scrum.They are only in people management

Different tools-Jira ,Rally

Say product name-Market place

Definition of Ready(DOR)

Definition of Done(DOD)

Definition of Done(Differs on each project)

Common rules:

- 1)Non functional requirements are met
- 2)Code review accepted
- 3)Documentation written or updated
- 4)Automated test written and passing
- 5)Manual test passing
- 6)There are No known bugs
- 7)Accepted by Product owner(PO) on stage/alpha
- 8)Design review is completed
- 9)Deployment to production and changes are merged in master branch

Definition of Ready

A developer should be able to gather the following information from a story

- 1)What to do-Business value described
- 2)Acceptance criteria is defined
- 3)Acceptance criteria should be testable
- 4)Story is estimated
- 5)There is common understanding in team
(Optional)Is monitoring needed

In Jira dashboard we have backlogs(Some number 100 user story) and Active sprints

say sprint 01 starts on 1 jan 2022

10 user story is picked up be product owner.

on 31 dec 2021 -Scrum team will sit together and do the sprint planning.In sprint planning it is verified that acceptance criteria is clearly defined in Gherkin/Buzz lang. And Estimate points are given in Fibonacci number (0,1,2,3,5,8,13,21)..

If scrum team is not selecting together estimate ,the minority count should justify why the estimate is as such. Then poker is played till all scrum team is agreeing to the estimate.

If agreed then the sprint is moved from backlog to active state

From Day 1 of sprint we will be working on

Dev -Dev task

QA-Qa task such as 1)Manual test cases
2)Automation test cases
3)Test Data prep 4)Test Env set up

Test case PO will do the review

In sprint duration we also work on few hours for backlog refinement/grooming

Every day scrum team will have a sprint call for 10 to 15 mins.Each person getting a chance to speak for 2 to 3 mins.

In every sprint call status-24 hours last/next and any blockers

Once sprint is done verify all definitions of ready is met. Then sprint review-Demo to Business presented Either by QA/PO/Dev

Velocity is calculated in sprint review-Percentage of sprint success

Sprint retrospective-1) What went well
2) What went wrong?
3) Improvement areas

The four scrum ceremonies are:

- Sprint Planning.
- Daily Scrum.
- Sprint Review.
- Sprint Retrospective.

Behaviour questions

1) Found a bug in production. How would you make sure that bug is not introduced again

ans: Add uncaught functionality to regression Test case. If there is scope of automation, add the script as well

Answer from youtube comments: He added - "Test Coverage Matrix" should be used to record the missed case and then for future events you can never miss on those critical bugs released to production."

2) What do you do when developer denies a bug.

ans: Provide Business documentation for reference and involve PR or business analyst for discussion
else dev may also reject stating the bug is non reproducible. In that time provide screenshot, timestamp, Test data for replicating issue

3) Greatest challenges while doing regression testing?

ans: Test data issue. e.g. repeated usage of same data will run out. Eg: Credit card balance. When repeated withdrawn amount the amount will run out
Improper selection of regression test cases might skip a major regression defect to be found

4) Difference between functional and non-functional testing:

Functional testing: Verifies system is working as expected according to requirement

Non-functional: How well does the application works or system perform with in design and resource constraints. Eg: Load, security

5) Key challenges in software testing:

Test data

Environment available

Using right set of tools

6) Different levels of testing:

Unit testing

Integration Testing

System testing

Acceptance testing

7) Drawbacks of agile implementation

Sprints are usually very deadline constrained

Documentation is not the priority

8) Approach to follow a high priority release to be delivered in very short time

Run Automation suites (Regression)

Run unit test

Manual testing on high level priority business test case (or risk based test cases)

9) Example for High priority low severity bug

Wrong logo image in application.

10) What is your understanding regarding test plan

Test plan is a document that consists of scope, approach, resource and outline of testing project and as well as the activities for tracking the progress of the project

11) Explain your reaction if a project you had been working on suddenly got change in its deadline

As a QA engineer, Be open on your thoughts, if you can deliver then project with QA sign off covering all test cases

If pre release is must, then discuss the opportunities of increasing the QA resources or possibility of partial product delivery

QA have the power to hold QA sign off, if you are not satisfied with quality of product which eventually stops release date

12) Diff between smoke and sanity testing

Sanity testing is a kind of software testing performed after receiving a software build with minor changes in code (Say bug fix) or functionality to ascertain that bugs have been fixed and no further issues are introduced due to these changes

Smoke testing is a special type of testing performed on software build to check the critical functionalities of program.

13) If a small section of code in application is updated? What is your testing approach in validating it?

Test the main issue and along with it check also the impacted/changed area of code by talking to developer which part of code is impacted

14) Difference between adhoc and Exploratory testing

Aadhoc testing- Application requirement is known and tested randomly without any test plan/test case

Exploratory testing- Application requirement is not known and tested randomly

15) What are your daily activities as a member of automation tester in your office?

Check email, and reply if required

Running smoke suite on daily basis and sending the mail to team on health of application

Check the tasks assigned to me

Participate in workshops/Tech talks

Verify defects assigned to you and take appropriate actions

Working on manual and Automation testing for stories in current sprint

16) How do you select regression test cases or form the regression test suite?

Include the test cases that verify core functionalities of the application

Include the test cases for functionality that have undergone recent changes

Include the test cases that have frequently yielded bugs

17) have you managed writing test cases without having any documentation?

In one of my previous projects, we had to redevelop the tool with new technologies. There are no testcases/Documentation for the old/existing product. As there is no documentation below, steps followed:

Understand and explore the existing product to come up with scenarios

Spend time with product owner or seniors to understand the business of the tool

Going through the production bugs, so that edge cases/test are not missed in writing the test for upgrading product

18) What is your first action you perform as a tester who you face weird errors?

Open developer tools and check in console for any java script error

Open network tab-> AND see if any request/response are failed

Verify application logs to understand the actual issue

19) How would you solve if there is any conflict with your peer QA on any technical aspect?

Involve team and discuss the conflict with larger audience. Open to take suggestions from your team.

Accept the decision made from team with smile

20) How do we decide if test case is not ideal candidate for automation?

Test which are highly dependent on data with frequent changes every time

Test which cannot be automated due to technical challenges (Eg otp on login)

Test which are unstable due to complex nature of application

Tedious testcase which require high manual efforts are picked for automation (Naveen).

Happy path scenario will be picked

Test cases which are stable and covers critical functionality should be included in automation (Naveen mock interview).

21) Difference between retesting and regression testing?

Retesting is done to make sure the testcase which failed in last execution are passed after defects are fixed

Regression testing is to ensure that changes have not affected unchanged part

Regression testing is not carried out for specific defect fixes

22) What is the most interesting bug that you've found recently?

Example: In Amazon say one url for order belonging to an account is accessible for another account. Prepare with your own example. Example: After creating a PR request a modal window notification is shown. The notification has two options: one to print and one to close. On clicking the close icon, the entries/records are not saved in db. It works only with print icon.

23) In agile environments, in case you have doubts regarding your project, how do you approach?

As a tester for domain-related queries, reach out to product owner/Business analyst

24) As a tester, how do you differentiate dummy login pages which are exactly designed like your working project login page?

By checking application logs

25) How will you tell if enough test cases have been created to test a product?

Each business requirement is mapped to at least one test scenario

Each test scenario should have positive and negative test cases

Using traceability matrix to check whether these test cases are covering all the requirement specification

Naveen:

STAR-Situation Task Action Result

1) Have you missed a deadline?

Yes, occasionally with proper justification like resource crunch (Sick leave), getting build late, lot of bugs and took time for retesting. Also make sure that next time with proper planning these are avoided.

2) Have you agreed with senior people/Manager?

Sometimes this happens. In that cases politely try to explain my thought process with clear supporting say (Standard approach/requirement) and there is no senior-Junior in company.

3) Have you tried something in your work and it does not work?

It happens, say I tried to do XYZ tool/poc for my application. It didn't work. We learned from it and apply in our next action.

For manager position say we tried to organize tech talk but could not happen due to deadline constraint etc..

4) Tell me a situation when you have helped a team member who is struggling.

Definitely I would love to solve their problem and help them. Say if they are facing issues with understanding the framework or creation of method. They can feel free to connect with me. Brainstorming etc...

5) Give an example of time you had to improvise to achieve your goal.

I tried to learn couple of technologies, discuss with seniors or team members. Example how to improve our regression test cycle process.

6) If you were offered the job, what is the first thing you would like to change?

First I will learn the existing process, sprint cycle, release cycle etc. If some one is following wrong approach I will try to improve it. Technically, if the code is in wrong, then I will try to conduct some sessions, ideas with the team.

7) Explain a time when you have faced unexpected challenges.

Talk to manager and let him know that. Answer on own: Say some team member is taking long leave due to illness. There is a resource crunch and deadline nearing. Explain the higher management about it.

Another example: A change of technology or lack of test data set up. Try to learn it.

8) Do you prefer working in team env or working independently?

Team. Different opinion, different talent working with common motto. If particular responsibility I will take ownership but work with team.

9) Would you like to work on weekend or extend your shift?

If work demands then I would definitely happy to support.

10) Have you had difficulty working with manager or other team members?

Same answer as question number 2

11) Ever faced a situation when team member is not performing his/her fair share of work?

Try to ask him his difficulties, motivate him, support him. If still no improvements talk to manager in politely explaining the situation.

12) As a QA tester, tell me when you felt proud.

When client appreciates my testing for ensuring quality. It ensures the goal of the company. What I have tested people are using that makes happy.

13)How would you prioritise your work

I prioritise my work based on company demands for ensuring company goals, than to take a training session which could be done in next batch

14)How would you ensure the newjoiner has received the KT.

Trust him/her and give ownership. Reverse KT and give few tasks/assignment according to the project. Open to queries

15)Tell about a difficult customer issue and how would you solve it

Try to verify and analyse the issue whether this is a miss from our end or env issue. If missed then add in the regression testcase.

16)What gets you excited about coming to work

Learning daily. Solve customer problems. Work with highly passionate team

Manual interview question:

<https://www.javatpoint.com/software-testing-interview-questions>

<https://www.interviewbit.com/software-testing-interview-questions/>

<https://www.edureka.co/blog/interview-questions/software-testing-interview-questions/>

https://www.guru99.com/software-testing-interview-questions.html

https://www.softwaretestingmaterial.com/100-software-testing-interview-questions/

Selenium interview questions

https://naveenautomationlabs.com/top-90-selenium-interview-questions-answers/

https://www.guru99.com/top-100-selenium-interview-questions-answers.html

https://www.interviewbit.com/selenium-interview-questions/

https://www.javatpoint.com/selenium-interview-questions

https://www.simplilearn.com/tutorials/selenium-tutorial/selenium-interview-questions-and-answers

https://www.softwaretestinghelp.com/selenium-interview-questions-answers/

Agile interview question

https://naveenautomationlabs.com/agile-testing-interview-questions-and-answers/

https://naveenautomationlabs.com/agile-development-interview-questions-and-answers/

https://www.upgrad.com/blog/must-know-agile-methodology-interview-questions/

Framework interview question

https://www.interviewbit.com/automation-testing-interview-questions/

https://naveenautomationlabs.com/testing-interview-questions/

https://www.scientecheasy.com/2020/01/selenium-framework-interview-questions.html/

Rahul Shetty YouTube: C:\Users\kkrid\OneDrive\Desktop\Udemy\Selenium\Framework Interview Question.docx

SQL interview questions

https://www.geeksforgeeks.org/sql-interview-questions/

Maven interview questions:

https://www.guru99.com/maven-interview-questions.html

Programming interview question:

https://www.techbeamers.com/java-coding-questions-software-testers/

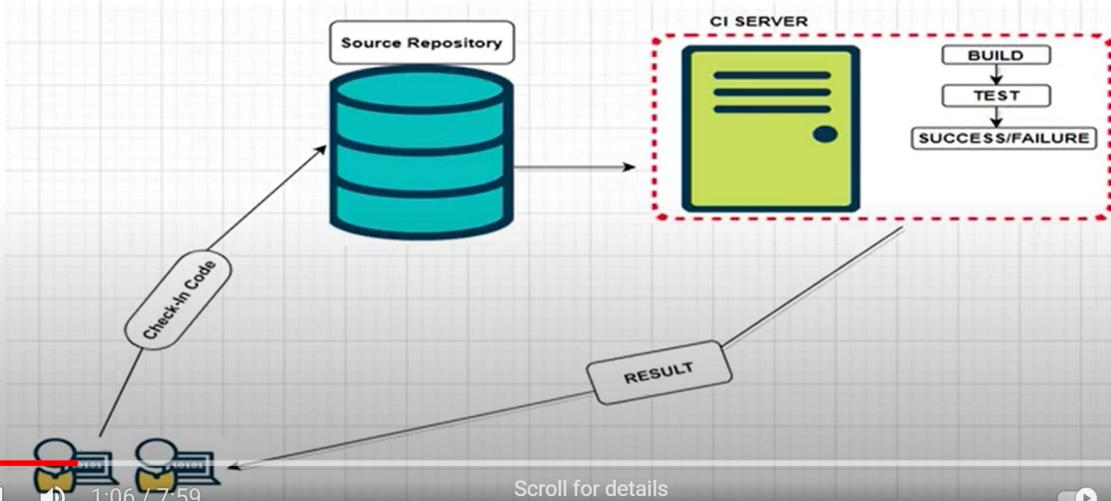
https://www.javatpoint.com/java-string-faq

Rahul Shetty coupons https://docs.google.com/document/d/1RnDWk33FA_uxdbCUQm_fsCi7cx92DIXHaiJSSzDSwzl/edit

What is continuous integration, continuous development, continuous deployment

What is Continuous Integration

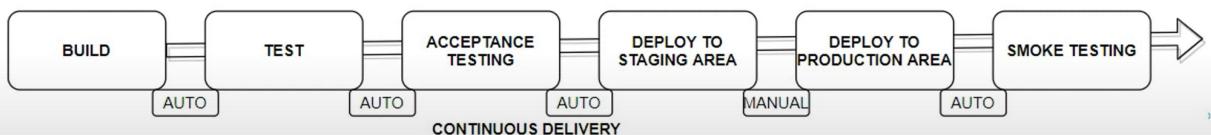
- Continuous integration (CI) is a software engineering practice in which frequent, isolated changes are immediately tested and reported on when they are added to a larger code base.



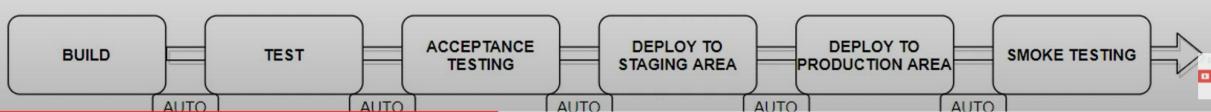
What is Continuous Deployment/Delivery

- In continuous deployment, every change goes through an automated pipeline and a working version of the application is automatically pushed to production.
- Continuous delivery helps you build a refined version of the software by continuously implementing fixes and feedback until finally, you decide to push it out to production.

CONTINUOUS INTEGRATION



CONTINUOUS DEPLOYMENT



Every pipeline works on
Build->Deploy ->Test->Release.



Pipeline - is a workflow with group of events or jobs that are chained and integrated with each other in sequence.

Every job in a pipeline has some dependency on one or more other jobs



2:38 / 3:12

Scroll for details



Questions-Naveen mock interview with Piyush matpal.

1)Your are hired for automation but giving manual task for few months.what is your reaction

Basically I am a tester and it defines me.Happy with Automation/Manual.Straightly we cannot jump into automation. First we need to analyse the product and requirement and then only we can implement automation.

2)How will you verify valid user logged in

Title,Profile page and functionality enabled.(Eg:user without no credit card access should not get cred card transaction page)

3)Best candidate for automation.

4)How would you conceive your product manager the scope of automation in a sprint.

I would tell the benefit of automation and then regression issue easy identification

5)Which area you are good at selenium

6) Selenium 4 architecture is different ,it is using w3c protocol.Read more about it

W3c replaces json wire protocol.

Key advantages.Since the browser and webdriver are already implemented in w3c(World wide wen consortium),selenium guys have changed the json wire protocol to w3c for easier communication

Advantages:

1)Standard

2)Stability

3)Actions API more powerful

Note Appium is wrapper of selenium.They are already adopted to w3c

7)HTML dom-Skeleton of webelements/nodes. It is in xml

8)Why javascriptexecutor?

9)Say there is a dropdown which is not implemented using select class.How would you select a value

1)Use javascript executor

2)Collect using findelements list and iterate the list and select the value

10)Page class-Objects or locators ,Page methods on the locators

Test class:Create Object of pageclass and invoke it method and assertion.

Note: It is standard approach to use assertion in test class not in page class as it is buried in some class

Difference between monolithic and microservices architecture

<https://www.tutorialspoint.com/difference-between-monolithic-and-microservices-architecture>

Difference between TDD,BDD,ATDD

In Acceptance Test-Driven Development (ATDD) technique, a single acceptance test is written from the user's perspective. It mainly focuses on satisfying the functional behavior of the system. This technique attempts to answer the question – Is the code working as expected?

Note: Acceptance Test-Driven Development is very similar to Behavioral-Driven Development. However, a key difference between them is: BDD focuses more on the behavior of the feature, whereas ATDD focuses on capturing the accurate requirements

Parameters	TDD	BDD	ATDD
Definition	TDD is a development technique that focuses more on the implementation of a feature	BDD is a development technique that focuses on the system's behavior	ATDD is a technique similar to BDD focusing more on capturing the requirements
Participants	Developer	Developers, Customer, QAs	Developers, Customers, QAs
Language used	Written in a language similar to the one used for feature development (Eg. Java, Python, etc)	Simple English, (Gherkin)	Simple English, Gherkin
Main Focus	Unit Tests	Understanding Requirements	Writing Acceptance Tests
Tools used	JDave, Cucumber , JBehave, Spec Flow, BeanSpec, Gherkin Concordian, FitNesse	Gherkin, Dave, Cucumber, JBehave, Spec Flow, BeanSpec, Concordian	TestNG , FitNesse, EasyB, Spectacular, Concordian, Thucydides

Write code to filter duplicate elements from an array and print as a list?

<https://www.geeksforgeeks.org/find-duplicates-given-array-elements-not-limited-range/>

2) Write code to sort the list of strings using Java collection?
Using Arrays.sort(), collections.sort()

3) - Write a function to reverse a number in Java?
<https://www.geeksforgeeks.org/write-a-program-to-reverse-digits-of-a-number/>

4- Write a method to check prime no. in Java?
<https://www.geeksforgeeks.org/prime-numbers/>

5- Write a Java program to find out the first two max values from an array?
<https://www.geeksforgeeks.org/find-second-largest-element-array/>

6- Write a Java program to find the longest substring from a given string which doesn't contain any duplicate characters?
<https://www.geeksforgeeks.org/length-of-the-longest-substring-without-repeating-characters/>

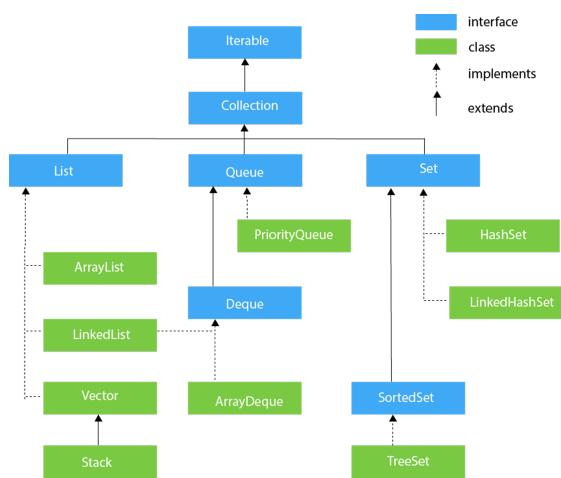
7- Write Java code to get rid of multiple spaces from a string?
<https://www.geeksforgeeks.org/how-to-remove-all-white-spaces-from-a-string-in-java/>

8- Write Java code to identify a number as Palindrome?
<https://www.geeksforgeeks.org/java-program-to-check-whether-a-string-is-a-palindrome/>

9- Write Java code to swap two numbers without using a temporary variable?
<https://www.geeksforgeeks.org/swap-two-numbers-without-using-temporary-variable/>

10) Reverse a string .Also with string buffer and string builder
<https://www.geeksforgeeks.org/reverse-a-string-in-java/>

11) Write a java code to check two strings are anagram of each other
<https://www.geeksforgeeks.org/check-whether-two-strings-are-anagram-of-each-other/>

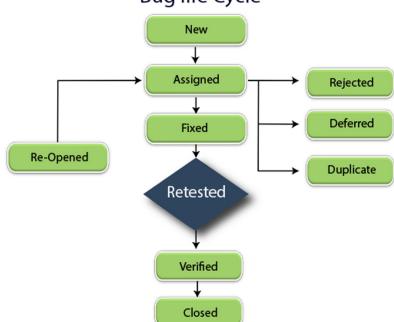


Difference Between Delete, Truncate and Drop Command

Difference between delete truncate and drop command in SQL

Sr.NO.	DELETE COMMAND	TRUNCATE COMMAND	DROP COMMAND
1	Delete is a DML command	Truncate is a DDL command	Drop is a DDL command
2	Delete is Used to delete the records in the table	Truncate is used to delete the data and keep the table structure as it is	Drop is used to drop the table data as well as table structure
3	Delete statement use the where clause to delete particular records	Truncate can't use where clause to delete particular data	Drop can't use where clause
4	Delete statement can be rollback before the commit	Truncate statement can't rollback	Drop statement can't rollback
5	Delete is slower as compare to Truncate	Truncate is faster	Drop removes the table from the database
6	Syntax: delete from <u>TableName</u> ;	Syntax: Truncate Table <u>TableName</u> ;	Syntax: Drop Table <u>TableName</u> ;
7	Eg. Delete from employee;	Eg. Truncate table Employee;	Eg. Drop table Employee;

Bug life Cycle



Pipeline Jenkins:

A pipeline is a collection of jobs that brings the software from version control into hands of the end user(Prod) by using automation tools.
It is a work flow to achieve continuous delivery in a software development process

Pipelines can be implemented in two ways:

- 1) Jenkins build pipeline plugin(Suitable for small scale applications).install Build pipeline plugin
- 2) Jenkins pipeline project(Large scale application with many jobs)

In second approach pipeline is created by executing Jenkins file

A jenkins file is a text file that stores entire workflow as code. This file is written using Groovy dsl(Domain specific language). It is written via two syntax namely

- 1) Declarative pipeline syntax (More famous). Code is fetched via SCM(Source control Management)
- 2) Scripted pipeline syntax (Script is written inside the text box)

First approach via Build pipeline plugin

Create different task/job for build ,deploy to QA ,Test ,and Release .

Now create a pipeline and add the initial job as build. Add chaining of the jobs. Chaining can be done in below way. This is called as upstream and downstream

The screenshot shows the Jenkins job configuration page. The top navigation bar includes tabs for General, Source Code Management, Build Triggers, Build Environment, Build, and Post-build Actions. The Source Code Management tab is selected, showing options for None or Git. The Build Triggers section is expanded, displaying various trigger configurations like 'Trigger builds remotely' (unchecked), 'Build after other projects are built' (checked), and 'Projects to watch' (set to 'Build'). It also includes options for triggering based on build stability ('Trigger only if build is stable' is checked) and periodic polling ('Build periodically', 'GitHub hook trigger for GITScm polling', and 'Poll SCM' are unchecked). The Build Environment section is partially visible below.

Second approach via Jenkins file(Declarative approach)

Refer here for sample Jenkins file <https://github.com/rahulthoughts/GitDemo/blob/master/.jenkinsfile>. Inside every block /stage groovy scripts will be written by devOps team

This file is pushed along with the project to GitHub

Now in Jenkins ,create a pipeline item ,select Pipeline script from SCM in Pipeline definition section.Add git repo URL and script path as .jenkins file name(Which ever name you have save your jenkins text file). Save it

Saravanan(Jenkins)

```
Info: to kill a service running at port
netstat -ano | findstr :8080
taskkill /PID <PID> /F
```

- 1) Create free style project
- 2) Create maven project .pass the location of pom.xml and in goals give maven command

Periodically schedule build in configure section(Jenkins job). You need to pass CRON command for scheduling timer. In console check the first line how the job started info CRON formatter can be googled online or the help section against the periodic section in jenkins

To integrate github into jenkins
You need to add git hub cred. Go to Manage jenkins->Manage credentials.Add cred(Username and pass) as global scope

TO publish HTML report

Install the plugin HTML report publisher
Configure the job and add post build action as publish html report.Add the directory accordingly eg:target\surefire-reports\

By default Jenkins will not render html and css by default.so reports will not be displayed with proper UI.TO overcome this follow
Manage Jenkins-->Manage Nodes-->Click settings(gear icon)--> click Script console on left and type in the following command:
System.setProperty("hudson.model.DirectoryBrowserSupport.CSP", "")

TO publish TestNG Results

- 1) Install testNG Results plugin
- 2) Add post build action as publish testNG result. By default regex of path till testng-result xml file is pointed. This plugin will convert the xml file into plugin

Automatic trigger build when code committed in github

This can be done via two ways

- 1) Poll scm(Set the timer via cron job)
- 2) Using hook trigger for Git scm polling(Push notification when code committed by github)

Steps to follow step 2:

- Ngrok Setup: 1. Go to - <https://ngrok.com/> (username:testuser1997insta@gmail.com password:kiranji@123). This ngrok is needed as we need to tunnel the local host url to public url
2. Sign Up and download zip file and extract the .exe file in some folder
3. Get your auth token from your ngrok account
4. Go to ngrok.exe folder and open terminal
5. Pass this command - ngrok.exe auth token "your token value" hit enter
6. Pass this command - Ngrok.exe http 8080 hit enter
7. Get the Forwarding URL - from ngrok CLI - <http://e530a6f192dd.ngrok.io> Github Setting:
8. Go to GitHub project setting - Webhooks
9. Add webhooks url - <https://e530a6f192dd.ngrok.io/github-webhook/>
10. Now make git commit
11. Build will start automatically

What is webHook <https://www.mparticle.com/blog/apis-vs-webhooks>

A webhook can be thought of as a type of API that is driven by events rather than requests. Instead of one application making a request to another to receive a response, a webhook is a service that allows one program to send data to another as soon as a particular event takes place. Webhooks are sometimes referred to as “reverse APIs,” because communication is initiated by the application sending the data rather than the one receiving it. With web services becoming increasingly interconnected, webhooks are seeing more action as a lightweight solution for enabling real-time notifications and data updates without the need to develop a full-scale API.

How to run Jenkins build or other activites from Command Line/Terminal

Authorization Setup:

Manage Jenkins – Configure Global Security

Authorization –

1. Check Anyone can do anything
2. Logged-in users can do anything and Allow anonymous read access

Manage Jenkins – Jenkins CLI

1. Download Jenkins-cli.jar
2. Place in Jenkins folder

To Execute the build through CLI with Auth -

```
java -jar jenkins-cli.jar -s http://localhost:8080/ -webSocket -auth your_username:your_password build your_project_name
```

TO trigger multiple build manual process parallelly(This works in freestyle or maven project)

Jenkins - Execute the same job parallelly multiple time Configuration - Select the Execute concurrent builds if necessary option

By default only two threads can be parallelly triggered. To Increase the number of executor in - Manage Jenkins-Manage Nodes-Settings- # of executors

How to trigger jenkins build remotely

Open Project - Configure Build Triggers - Trigger builds remotely Using Token Authentication: - Setup some token value

Take the URL example :<http://localhost:8080/job/MavenTestFromGITHUB/build?token=1234>

We can directly hit the URL in browser to start the build

Or use curl command to hit via cmd

If user name and password is asked to be passed then hit via URL :

```
http://your\_username:your\_password@localhost:8080/job/M
```

We can also hit this URL via script using HttpURLConnection class(The class used to find broken link).Follow the similar code

```
String url="http://localhost:8080/job/MavenTestFromGITHUB/build?token=1234";
```

```
HttpURLConnection huc = (HttpURLConnection) new URL(url).openConnection();
huc.setRequestMethod("HEAD");
huc.connect();
System.out.println("Response code is "+ huc.getResponseCode());
```

Jenkins Master and Slave Configurations

Trigger Build in Jenkins Slave on Windows Jenkins

Master : Main Jenkins server is the Master

Jenkins Slave : A Slave is a Java executable that runs on a remote machine

Steps to create a node

Maanage Jenkins->Manage nodes and clouds->new node->Give node name and select permanent agent

Give label as mandatory information and fill other information.Note Remote root directory can be a folder in local machine.Ideally this directory will be the server machine in real env.

Initially the slave will be offline.There will a jar to download in slave machine page.Download and put it into remote root directory location. A command will be shown in jenkins same page to make the slave as online

In project configuration select "Restrict where this project can be run" and give the label expression

How to Trigger Job with Email Using Poll Mailbox Trigger Plugin Steps:

1. Add plugin - Poll Mailbox Trigger Plugin
2. Configure - Poll Mailbox Trigger
3. Username and Password of your email account
4. Subject = 'Trigger_Job'
5. Advanced - Schedule (cron)
6. Send Email with given Subject

Note:You need to change your google setting

Less secure app access to Yes

TO create a dashBoard Monitor ,you need to install plugin Build Monitor View

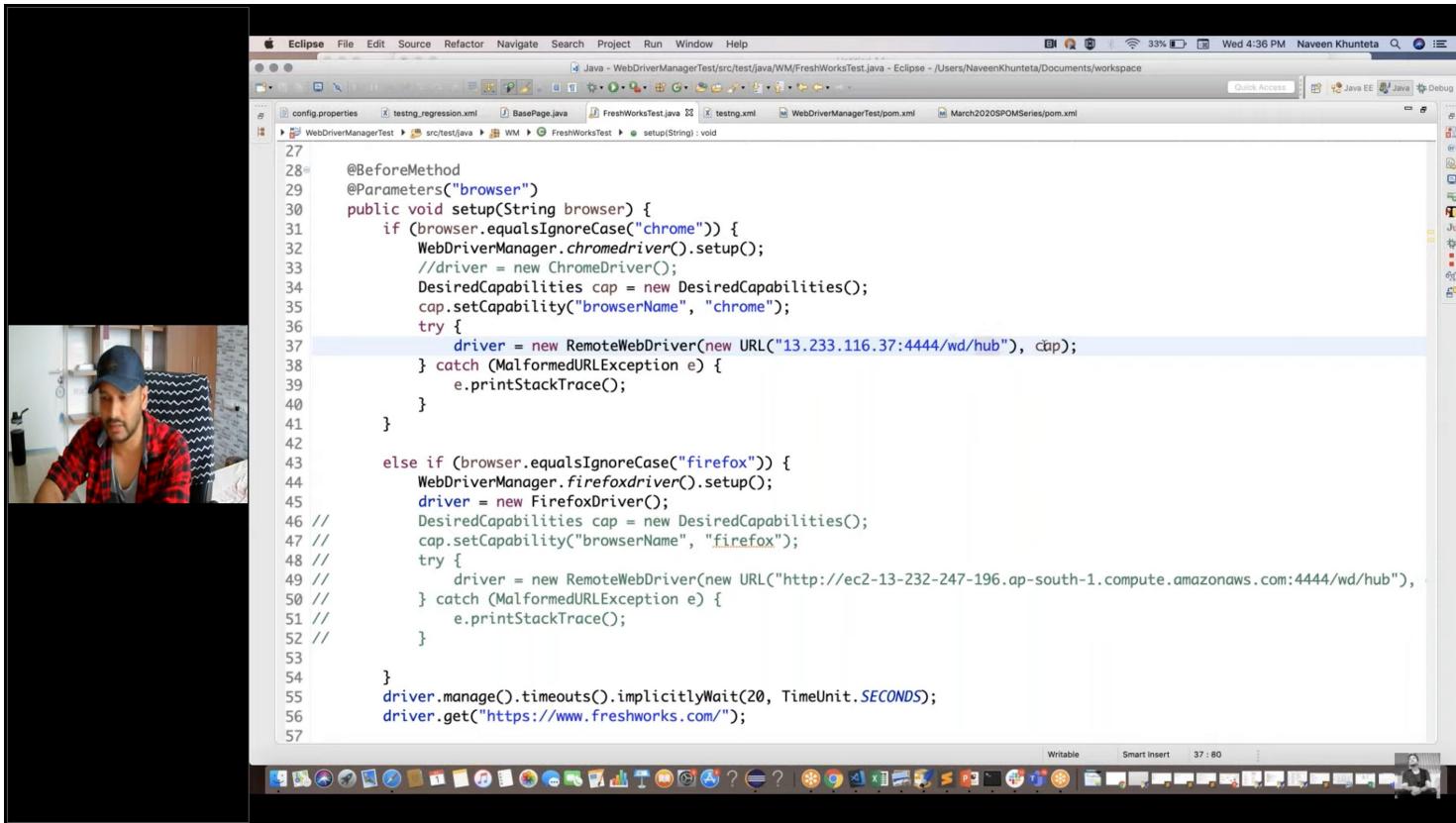
Click on the Plus icon in jenkin dashboard and select Build Monitor view.Select the jobs which needs to be added in the monitor

JENKINS - Blue Ocean View | Blue Ocean Dashboard Blue Ocean is a new User Interface to provide an interactive User Experience view for Jenkins Pipeline, Dashboard, and Jobs
Steps: 1. Install Blue Ocean plugin 2. Navigate to Blue Ocean View

Selenium grid:(Rahul shetty)

What is selenium Grid:

Selenium grid is a smart proxy server that makes it easy to run test in parallel on multiple machines



Different ways of Selenium grid infrastructure:

- 1) Local machine both hub and nodes (local host, preferred only for practice purpose)
- 2) Different hardware machine (Expensive)
- 3) Different VMs - VMware (little expensive)
- 4) Docker containers
- 5) Different cloud vendors - AWS, Azure
- 6) Browser stack