



INTERVIEW QUESTIONS

Tell me about your self?

==== TELL ME ABOUT YOUR SELF?====

As of today I have experience in all layers of testing. I have expertise in various tools like **Java, TestNG, Maven, Selenium, Jenkins, AWS, GIT, JIRA, Postman, Rest-Assured, JDBC, SQLDeveloper** among others.

I have experience writing **manual test** cases implementing screen shots as evidence of my testing.

I have worked with various projects and met deadlines within time, As a team player I have successfully developed and implemented various Testing methods and approaches.

My experience in testing covers back end, API, and UI using the latest tools in my company.

I have participated in various ceremonies such as Planning meeting, Grooming, retrospective and Demo meetings. I am currently in Agile environment and I am experienced in waterfall as well.

Currently my team mates describe me as someone who can complete a task and achieve goals within time frame at the same time I like to enjoy working and collaborate with my team mates to achieve the same goal.

==== TELL ME ABOUT YOUR SELF? SHORT ANSWER====

I have 7 years of experience as test automation engineer and i have strong understanding of software development life cycle both waterfall and agile

I am mainly doing test automation however when its needed i am doing manual testing so i am a cross-functional team member at my current project and actually every single project I worked before.

I have successfully developed ad implemented thousands of test scripts for web applications by using data driven behavior driven, hybrid framework

I am good at core **JAVA**. Selenium web driver, **CUCUMBER, JENKINS, MAVEN, TESTNG** And also I have experience with **JDBC, RestApi, Postman** among other testing tools.

Tell them about your latest tools you are using as well as your certifications, your achievements ..

Tell me about Your Framework

===== TELL ME ABOUT YOUR FRAMEWORK ======

My framework is based on **Behavior Driven Development (BDD)** it uses **Page Object Model** which increases reusability and maintainability of the framework.

Then we are using **Maven** to manage and centralize my dependencies plugins for **POM.XML**. We are also using **Apache POI** with excel spreadsheets.

Then we are using **testNG** as testing Engine. **Jenkins** for our continuous integration and and **GIT** for our source code management.

We are also using **restAssure** for working with **API**, **postman** for manual testing,

And for Backend Testing I am using **JDBC connections statement** and **resultSet**. For database testing I manually use **SQL developer** for producing High level **SQL Queries**.

Explain about the tools you are using in your current project and tools you have learned. Give them details so later they don't ask

Tell me about Your team

==== TELL ME ABOUT YOUR TEAM ===

My team consist of 9 people:
3 developers
3 automation testers (including myself)
1 business analyst
1 Scrum master
1 Product Manager

==== TELL ME ABOUT YOUR TEAM ===

My team consist of 9 people:
4 developers
2 automation testers (including myself)
1 business analyst
1 Product Manager
1 Scrum Master works with different teams

You can have different sizes in teams go based on your comfort to explain.

OOPS Automation Framework

Abstraction?

== What is Abstraction ==

In Page Object Model design pattern, we write locators (such as id, name, xpath etc.,) in a Page Class. We utilize these locators in tests but we can't see these locators in the tests. Literally we hide the locators from the tests.

Abstraction is the methodology of hiding the implementation of internal details and showing the functionality to the users.

Points to remember:

1. Abstract classes may or may not include abstract methods
2. If a class is declared abstract then it cannot be instantiated.
3. If a class has abstract method then we have to declare the class as abstract class
4. When an abstract class is subclassed, the subclass usually provides implementations for all of the abstract methods in its parent class. However, if it does not, then the subclass must also be declared abstract.

Interface?

== What is Interface ==

Basic statement we all know in Selenium is WebDriver

```
driver = new FirefoxDriver();
```

WebDriver itself is an Interface. So what this means is that WebDriver driver = new FirefoxDriver(); we are initializing Firefox browser using Selenium WebDriver. It also means we are creating a reference variable (driver) of the interface (WebDriver) and creating an Object. Here WebDriver is an Interface as mentioned earlier and FirefoxDriver is a class.

An interface in Java looks similar to a class but both the interface and class are two different concepts. An interface can have methods and variables just like the class but the methods declared in interface are by default abstract.

Points to remember:

1. Java interface represents IS-A relationship similar to Inheritance
2. Interface cannot be instantiated same like abstract class
3. Java compiler adds public and abstract keywords before the interface methods
4. Java compiler adds public, static and final keywords before data members
5. Interface extends another interface just like a Class extends another Class but a class implements an interface.
6. The class that implements interface must implement all the methods of that interface.
7. Java allows you to implement more than one interface in a Class

Inheritance

== What is inheritance ==

We create a Base Class in the Framework to initialize WebDriver interface, WebDriver waits, Property files, Excels, etc., in the Base Class.

We extend the Base Class in other classes such as Tests and Utility Class. Extending one class into other class is known as Inheritance.

Multi-Level Inheritance

Super Class

methodA()

Sub Class 1

methodA() -> from A

methodB()

→ Level 1

Sub Class 2

methodA() -> from A

methodB() -> from B

methodC()

→ Level 2

Polymorphism

== What is Polymorphism ==

The combination of overloading and overriding is known as Polymorphism. Polymorphism allows us to perform a task in multiple ways.

Polymorphism is the ability of an object to take on many forms. The most common use of polymorphism in OOP occurs when a parent class reference is used to refer to a child class object.

- DYNAMIC POLYMORPHISM - OVERRIDING
- STATIC POLYMORPHISM - OVERLOADING

```
public class Demo
{
    public static void main(String[] args) {
        Animal a1 = new Cat();
        a1.makeNoise(); //Prints Meowoo

        Animal a2 = new Dog();
        a2.makeNoise(); //Prints Bark
    }
}
```

Override

Overload

==== Method OVERIDING ====
We use a method which was already implemented in another class by changing its parameters.
Declaring a method in child class which is already present in the parent class is called Method Overriding.

Overriding

```
class Dog{
    public void bark(){
        System.out.println("woof ");
    }
}
class Hound extends Dog{
    public void sniff(){
        System.out.println("sniff ");
    }
    public void bark(){
        System.out.println("bowl");
    }
}
```

Method Overloading

We use **implicit** wait in Selenium. Implicit wait is an example of **overloading**. In Implicit wait we use different time stamps such as SECONDS, MINUTES, HOURS

Normally A class having multiple methods with same name but different parameters is called Method Overloading

Overloading

```
class Dog{
    public void bark(){
        System.out.println("woof ");
    }
}
//overloading method
public void bark(int num){
    for(int i=0; i<num; i++)
        System.out.println("woof ");
}
```

Encapsulation

==== Method Encapsulation ====
All the classes in a framework are an example of Encapsulation. In POM classes, we declare the data members using **@FindBy** and initialization of data members will be done using Constructor to utilize those in methods.

```
class Account{
    private int account_number;
    private int account_balance;

    public void show Data(){
        // code to show data
    }

    public void deposit(int a){
```

Run Group Of Test In TestNG

* How to run a group of test cases using TestNG?

Groups are specified in your `testng.xml` file and can be found either under the `<test>` or `<suite>` tag. Groups specified in the `<suite>` tag apply to all the `<test>` tags underneath.

```
1 @Test (groups = { "smokeTest", "functionalTest" })
2 public void loginTest(){
3     System.out.println("Logged in successfully");
4 }
```

In my current project I use implicit wait at the beginning of my test normally I have it On my @Before so that when I execute my test It waits until it loads.

Implicit wait

```
@Before
public void setUp(Scenario scenario) {
    WebDriver driver = Driver.getDriver();
    driver.manage().timeouts().implicitlyWait(30, TimeUnit.SECONDS);
    driver.manage().window().fullscreen();
}
```

In my current project I use explicit wait to force a wait on a specific object or condition instead of every object.

Explicit Wait

```
public static WebElement waitForVisibility(WebElement element, int timeToWaitInSec) {
    WebDriverWait wait = new WebDriverWait(Driver.getDriver(), timeToWaitInSec);
    return wait.until(ExpectedConditions.visibilityOf(element));
}
```

In my current project to handle Frames I use 3 important parameters inside the frame such as : id, name, frame webElement

Syntax:

Frames

inside the frame you can enter parameters such as: id, name, frame WebElement

```
driver.switchTo().frame(id)
```

In my current project in order to switch windows from 1st to 2nd or 3rd I develop a Java Collection Set Object in which I store the method Driver.getWindowHandles(); then I use Iterator with .next() method to switch windows. Once I am in the correct window I store it in a String, then I use the method: Driver.switchTo().window("3rdwindow").

3rd window

Syntax:

```
Set<String> window = Driver.getWindowHandles();
String a = window.iterator();
a.next(); <---- 1st window
a.next(); <---- 2nd window
String 3rdwindow = a.next(); <---- 3rd Window
```

Driver.switchTo().window("3rdwindow").

Locators

In Selenium

- In Selenium WebDriver we have :

ID, name, classname, Xpath, Css, PartialLinkText, LinkText

```
● className(String className) : By - org.openqa.selenium.By.className(String className)
● cssSelector(String selector) : By - org.openqa.selenium.By.cssSelector(String selector)
● id(String id) : By - org.openqa.selenium.By.id(String id)
● linkText(String linkText) : By - org.openqa.selenium.By.linkText(String linkText)
● name(String name) : By - org.openqa.selenium.By.name(String name)
● partialLinkText(String linkText) : By - org.openqa.selenium.By.partialLinkText(String linkText)
● tagName(String name) : By - org.openqa.selenium.By.tagName(String name)
● xpath(String xpathExpression) : By - org.openqa.selenium.By.xpath(String xpathExpression)
```

- **Xpath syntax:** // tagname[@id='value']
- **Css syntax:** tag name[id=value]

Contains Regular Expression Xpath

- If I see some dynamic attributes I use regular expression for Xpath
And this is how I use it

< id="uil23 23"

// tagname[contains(id*='uil2')]

Contains Regular Expressing CSS

- If I see a dynamic attribute I use css with the following to help me identify my locator
And I use:

< id="uil23 23"

Tag name[id*='uil']

FirefoxDriver
interface or
class?

Is FirefoxDriver a class or an Interface?

FirefoxDriver is a java class and it implements a WebDriver Interface.

Dynamic
Polymorphism

Its consider a Dynamic Polymorphism.

WebDriver

Dynamic binding (also know as)

ChromeDriver

FirefoxDriver

Stale
ElementRefere
nce Exception

What is StaleElementReferenceException?

Stale element is when an old element is no longer available.

Normally the reason is one: the element has been deleted entirely.

Two: the element is no longer attached to the DOM.

How did I overcome this issue is one: I tried refreshing the page and try again for the same element.

Two: If the element is not attached to DOM then I try using try-catch block within for loop.

Three: wait for the element until it gets available. I use Selenium waits.

Framework
from scratch?

Have you created framework from Scratch?

Beginner: No I did not get a chance to create framework from scratch. I have used the framework which is already available. My contribution is mostly in creating test cases by using the existing framework.

Experienced Tester: I have contributed in developing framework from scratch, I have designed with the tools I am experience.

How many test
cases have
you
automated?

How many test cases you have automated per day?

It depends on test case scenario complexity, I did automate 2-5 test scenarios per day when the complexity is limited. Sometimes just 1 or fewer test scenarios in a day when the complexity is high.

Assert and
verify

difference between assert and verify in selenium?

When **Assert** fails the test is aborted, so when assertion fails all test steps after that line of code are skipped.

When **verify** command fails the test will continue executing but it will log the failure regardless is true or false.

What is Soft Assert and Hard Assert in Selenium?

Hard Assert: it throws an `AssertionError` immediately when an assert statement fails and

FirefoxDriver
interface or
class?

Its consider a Dynamic Polymorphism.

Dynamic binding (also know as)

WebDriver

ChromeDriver

FirefoxDriver

Dynamic
Polymorphism

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automated?

Assert and
verify

Test Priority in TestNG?

```

1 package TestNG;
2 import org.testng.annotations.*;
3 public class PriorityTestCase{
4     @Test(priority=0)
5     public void testCase1() {
6         system.out.println("Test Case 1");
7     }
8     @Test(priority=1)
9     public void testCase2() {
10        system.out.println("Test Case 2");
11    }
12 }
```

Output:

```

1 Test Case 1
2 Test Case 2
```

How to set test case priority in TestNG?

We use priority attribute to the @Test annotations. In case priority is not set then the test scripts execute in alphabetical order.

TestNG Assertions

Create TestNG.xml

- How to create and run TestNG.xml?

In TestNG framework, we need to create **TestNG XML** file to create and handle multiple test classes. We do configure our test run, set test dependency, include or exclude any test, method, class or package and set priority etc in the XML file.

- What is TestNG Assert and list out some common Assertions supported by TestNG?

TestNG Asserts help us to verify the condition of the test in the middle of the test run. Based on the TestNG Assertions, we will consider a successful test only if it is completed the test run without throwing any exception.

Some of the common assertions supported by TestNG are

- assertEquals(String actual, String expected)
- assertEquals(String actual, String expected, String message)
- assertEquals(boolean actual, boolean expected)
- assertTrue(condition)
- assertFalse(condition, message)
- assertFalse(condition)
- assertFalse(condition, message)

Database Testing

- How to achieve Database testing in Selenium?

JDBC is a SQL level API that allows us to execute SQL statements. It creates a connectivity between Java Programming Language and the database.

Using JDBC Driver we can ..

i. Establish a Database connection ii. Send SQL Queries to the Database iii.

Process the results

CI-CD

- What is Continuous Integration? CI

Continuous Integration is a development practice which aims to make sure the correctness of a software. After each commit, a suite of tests run automatically and test the software to ensure whether the software is running without any breaks. If any test fails, we will get immediate feedback say "build is broken" or "Build failed"

In simple words, continuous integration is a process of verifying the correctness of a software.

We can schedule the test suite execution using these CI Tools.

Build Pipeline: CI Pipeline



Desire Capabilities

What is desired capabilities?

In Selenium we use desired capabilities to handle SSL certificates in chrome browser

```

public class SauceLabsDemo {
    WebDriver driver;

    public static final String USERNAME = "comal";
    public static final String ACCESS_KEY = "3b65d51-1b82-4ed3-8a21-654d70da8bed";
    public static final String URL = "https://" + USERNAME + ":" + ACCESS_KEY + "@ondemand.saucelabs.com:443/wd/hub";

    @BeforeTest
    public void setUp() throws MalformedURLException {
        DesiredCapabilities caps = DesiredCapabilities.firefox();
        caps.setPlatform(Platform.SIERRA);
        caps.setCapability("version", "latest");

        driver = new RemoteWebDriver(new URL(URL), caps);
    }
}
```

Maven Build Lifecycle

Different Phases in Maven Build Lifecycle

validate	Validate the project is correct and all necessary information is available.
compile	Compile the source code of the project.
test	Test the compiled source code using a suitable unit testing framework.
package	Take the compiled code and package it in its distributable format.
verify	Run any checks on results of integration tests to ensure quality criteria are met.
install	Install the package into the local repository, for use as a dependency in other projects locally.
deploy	Copy the final package to the remote repository for sharing with other developers and projects.

Maven Build Phases

- These lifecycle phases are executed sequentially to complete the default lifecycle.
- We want to specify the maven `package` command, this command would execute each default life cycle phase in order including `validate`, `compile`, `test` before executing `package`.
- We only need to call the last build phase to be executed.

PARALLEL Execution

Sauce labs

SELENIUM GRID AUTOMATION

SAUCE LABS

* In my current project I am using sauce labs for parallel testing in different platforms as well as browsers like Chrome, Firefox, Internet Explorer, Safari and others. The steps for my parallel testing are....

First I need to make sure that I have the ACCESS_KEY which is provided in my documentation. This key is available for my team. Second I make sure to enter Username specified for this account. Then I verify that my method to connect to sauce labs has the proper credentials.

When I am doing my testing I call on my method from our utility class for sauce labs connection. Inside that method I have Desire Capabilities which specifies what browser I want to run, also my platform and my set capability which will call on the latest version of the machine. I can give you an example if you allow me:

Example:

```
public class SauceLabsDemo {

    WebDriver driver;

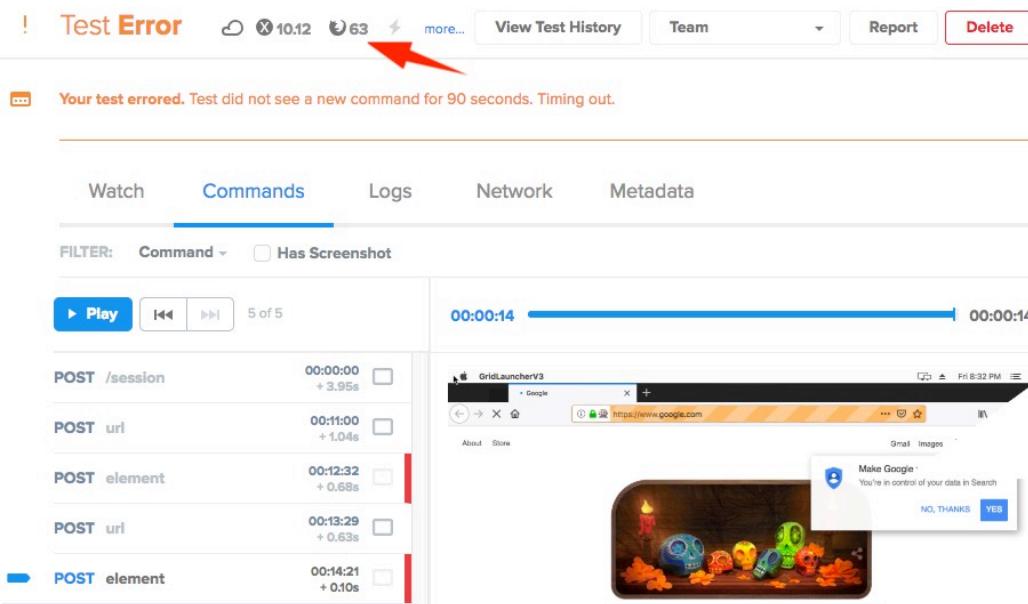
    public static final String USERNAME = "AdmiralCoder";
    public static final String ACCESS_KEY = "072e6fe7-8cb3-4eba-81c1-6cb6104d0541";
    public static final String URL = "https://" + USERNAME + ":" + ACCESS_KEY +
    "@ondemand.saucelabs.com:443/wd/hub";

    @BeforeTest
    public void setUp() throws MalformedURLException {
        DesiredCapabilities caps = DesiredCapabilities.chrome();
        caps.setPlatform(Platform.SIERRA);
        caps.setCapability("version", "latest");

        driver = new RemoteWebDriver(new URL(URL), caps);
    }

    @Test
    public void testGoogle() throws InterruptedException {
        driver.get("https://google.com");
        driver.findElement(By.id("q")).sendKeys("Java programming" + Keys.ENTER);
        System.out.println(driver.getTitle());
        Assert.assertTrue(driver.getTitle().startsWith("Java programming"));
    }
}
```

SAUCE LABS REPORT FAILED TEST



The screenshot shows a Sauce Labs test error report. At the top, there's a header with a 'Test Error' status, a cloud icon, '10.12' (likely a session ID), '63' (number of tests), and a 'more...' button. A red arrow points to the 'more...' button. Below the header, a message says 'Your test errored. Test did not see a new command for 90 seconds. Timing out.' The main interface has tabs for 'Watch', 'Commands' (which is selected), 'Logs', 'Network', and 'Metadata'. Under 'Commands', there's a table with columns for 'Action', 'Path', 'Duration', and 'Status'. The table shows five commands: 'POST /session' (0:00:00, +3.95s), 'POST url' (0:01:00, +1.04s), 'POST element' (0:02:32, +0.68s), 'POST url' (0:03:29, +0.63s), and 'POST element' (0:04:21, +0.10s). To the right of the table is a timeline showing the duration of each command. Below the timeline is a screenshot of a browser window showing a Google search results page with a 'Make Google' pop-up.

Action	Path	Duration	Status
POST	/session	00:00:00 + 3.95s	
POST	url	00:01:00 + 1.04s	
POST	element	00:02:32 + 0.68s	
POST	url	00:03:29 + 0.63s	
POST	element	00:04:21 + 0.10s	

Selenium GRID

Selenium GRID

In my current project I am using selenium Grid for parallel execution we have method in our driver class that calls on executing in different platforms and browsers. Because selenium is grid is managed by me I make sure to have a small regression that is performed every week for my current user stories that I am working on. For that I use selenium grid with the help of one of our EC2 virtual machines. Inside my virtual machine I have set up VSGRID for my nodes and hubs. Currently I am only testing in 2 nodes and 10 different hubs. Because our project is not very complex I make sure this set up is always working. Let me give you an example on how I set up my selenium grid.

Example:

I have a method in my Driver class that calls on my selenium Grid which contains DesiredCapabilities, set platform, and the remoteWebDriver which calls on my ec2 virtual machine location and the setting for my Desire capabilities

Let me go more into detail for example:

```
public static WebDriver getDriver() {
    if (driver == null) {
        switch (ConfigurationReader.getProperty("browser")) {
            case "chrome":
                WebDriverManager.firefoxdriver().setup();
                driver = new FirefoxDriver();
                DesiredCapabilities caps = DesiredCapabilities.chrome();
                caps.setPlatform(Platform.ANY);
                try {
                    driver = new RemoteWebDriver(new URL("http://54.145.29.46:4444/wd/hub"), caps);
                } catch (MalformedURLException e) {
                    // TODO Auto-generated catch block
                    e.printStackTrace();
                }
                break;
            case "firefox":
                WebDriverManager.chromedriver().setup();
                driver = new ChromeDriver();
                break;
            default:
                WebDriverManager.firefoxdriver().setup();
                driver = new FirefoxDriver();
        }
    }
    return driver;
}
```

#1 way

```
public class JDBCConnection {
    String oracleDbUrl = "jdbc:oracle:thin:@ec2-52-70-143-199.compute-1.amazonaws.com:1521:xe";
    String oracleDbUsername = "hr";
    String oracleDbPassword = "hr";

    @Test(enabled=false)
    public void oracleJDBC() throws SQLException {
        Connection connection=DriverManager.getConnection(oracleDbUrl, oracleDbUsername,
        oracleDbPassword);
        //Statement statement=connection.createStatement();
        Statement
        statement=connection.createStatement(ResultSet.TYPE_SCROLL_INSENSITIVE,ResultSet.CONCUR_READ_ONLY);
        ResultSet resultSet = statement.executeQuery("select * from countries");

        resultSet.last();
        int rowsCount = resultSet.getRow();
        System.out.println("Number of rows:" + rowsCount);

        resultSet.first();
        while(resultSet.next()) {
            System.out.println(resultSet.getString(1)+"-"+resultSet.getString("country_name")
            +"-"+resultSet.getInt("region_id"));
        }
        resultSet.close();
        statement.close();
        connection.close();
    }
}
```

#2nd way simple explanation

JAVA TECHNICAL QUESTIONS

- Reverse int Array

```
public class reverseArray {  
    public static void main(String... args) {  
        int[] array = {2, 3, 45, 2, 1, 4, 5, 3};  
        System.out.println("array is " + Arrays.toString(array));  
        reverse(array);  
        System.out.println("reverse array is " + Arrays.toString(array));  
    }  
  
    private static void reverse(int[] array) {  
        int maxIndex = array.length - 1;  
        int halfLength = array.length / 2;  
        for (int i = 0; i < halfLength; i++) {  
            int temp = array[i];  
            array[i] = array[maxIndex - i];  
            array[maxIndex - i] = temp;  
        }  
    }  
}
```

Result:

```
array is [2, 3, 45, 2, 1, 4, 5, 3]  
reverse array is [3, 5, 4, 1, 2, 45, 3, 2]
```

API Interview Questions?

Request / Response

- What is request and response in API?

- Lets say we have an example for log in we will carry your username and password, then we will get the response type weather log in information is in correct or not
- Request -> what front end sends
- Response -> what it receives back

Endpoints

Rest is Stateless which means client data is not stored on the server it uses HTTP protocol

- What are end points in API?

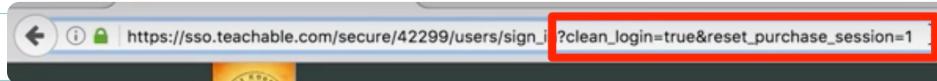
- Lets say we have complete Address
 - Home Number
 - Street Address
 - City
 - Zip
 - State
 - Country
- In order to talk to a server to request information you need URI, Resources, Parameters
 - URI -> Street Address



- Resources -> Specific Page



- Parameters -> data to filter resources when we want to get specific data from the resource



CRUD / HTTP

- HTTP what is it and what keywords are you familiar with? Also known as CRUD (application). "Create, Read, Update, Delete"

- Get -> Read -> reading the information
- Post -> Create -> New Information
- Put -> Update -> modifying existing information
- Delete -> Delete -> delete information from server

API

- What are Headers in API?

- It contains information for full request and response.

	Headers	Preview	Response	Timing
General	Request URL: https://lh3.googleusercontent.com/-6Ef4Maugp5c/AAAAAAAIAI/AAAAAAAABtNlbDi6SCS7KirCcB72fi-s0xVBtKaw/s32-c-mo/photo.jpg Request Method: GET Status Code: 200 (from memory cache) Remote Address: 172.217.8.1:443 Referrer Policy: no-referrer-when-downgrade			

- It contains Request and Response information

	Request Headers	Response Headers
Request Headers	Provisional headers are shown Referer: https://notifications.google.com/ User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_13_3) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/69.0.3497.100 Safari/537.36	access-control-allow-origin: * access-control-expose-headers: Content-Length alt-svc: quic=":443"; ma=2592000; v="44,43,39,35" cache-control: public, max-age=86400, no-transform content-disposition: inline;filename="" content-length: 425 content-type: image/png date: Sat, 27 Oct 2018 01:13:13 GMT expires: Sun, 28 Oct 2018 01:13:13 GMT server: fife status: 200 timing-allow-origin: * vary: Origin x-content-type-options: nosniff x-xss-protection: 1; mode=block

API Interview Questions?

Request / Response

- What is the most important thing you verify when doing API testing?
 - One the status code
 - Action response (completed, success, error)
 - Then other few details
- This is the most important things you verify when doing RestAPI testing aside from testing data

HTTP CODES

 Headers are valid

 200 OK 125.40 ms

 Headers are valid

 404 Not Found 63.00 ms

Endpoints

- How do you test rest API?

- In my current project when I test the API what I do is verify that each end Rest API end point is working as expected
- I send POST, PUT, GET, DELETE type of requests and verify response status code and response body.
- Currently I am performing positive and negative testing of API.

API GET METHOD and ABSTRACT CLASS used in Get API Method

```

public void get(String url) throws ClientProtocolException, IOException {
    CloseableHttpClient httpClient = HttpClients.createDefault();
    HttpGet httpget = new HttpGet(url); // http get request
    CloseableHttpResponse closeableHttpResponse = httpClient.execute(httpget); // hit the GET
    URL
    // a. getting status code
    int statusCode = closeableHttpResponse.getStatusLine().getStatusCode();
    System.out.println("Status Code --->" + statusCode);

    // b. getting JSON format String
    String responseString = EntityUtils.toString(closeableHttpResponse.getEntity(),
    "UTF-8");

    JSONObject responseJson = new JSONObject(responseString);
    System.out.println("Response JSON from API --->" + responseJson);

    // c. getting all headers from API
    Header[] headersArray = closeableHttpResponse.getAllHeaders();
    HashMap<String, String> allHeaders = new HashMap<String, String>();

    for (Header header : headersArray) {
        allHeaders.put(header.getName(), header.getValue());
    }

    System.out.println("Headers Array --->" + allHeaders);
}
}
=====
```

CloseableHttpClient : This is a Abstract class that is used in API when you connect to a HttpClient
`HttpClients.createDefault();` = will create 1 client connection it will return one
`closeableHttpClient object.`

Database Testing

DataBase Testing

• HOW DO YOU TEST THE DATABASE?

- in my current project I am testing the database by using DatabaseConnection Method (in my method I have 3 parameters for url userID and password) when I call on this. Method I execute my database for any testing needed. For manual Testing I Use SQL Developer for Queries.
- Let me give you one simple example:
- I will have my URL, User ID and password

Explain your Database Testing Approach and Provide examples

• ----- Example -----

```

String oracleDbUrl = "jdbc:oracle:thin:@ec2-52-70-143-199.compute-1.amazonaws.com:1521:xe";
String oracleDbUsername = "hr";
String oracleDbPassword = "hr";

@Test
public void jdbcMetadata() throws Exception{
    Connection connection=DriverManager.getConnection(oracleDbUrl, oracleDbUsername, oracleDbPassword);
    Statement statement=connection.createStatement(ResultSet.TYPE_SCROLL_INSENSITIVE,ResultSet.CONCUR_READ_ONLY);
    String sql = "select employee_id,last_name,job_id,salary from employees";
    ResultSet resultSet = statement.executeQuery(sql);

    // 1: DATABASE METADATA
    DatabaseMetaData dbMetadata = connection.getMetaData();
    System.out.println("User:" + dbMetadata.getUserName()); // returns User and database type
    System.out.println("Database type:" + dbMetadata.getDatabaseProductName());

    // 2: RESULTSET store it in ResultSetMETADATA
    ResultSetMetaData rsMetadata = resultSet.getMetaData();
    System.out.println("Columns count:" + rsMetadata.getColumnCount());
    System.out.println(rsMetadata.getColumnName(1));

    //print all column names using a loop
    for (int i = 1; i <= rsMetadata.getColumnCount(); i++) {
        System.out.println(i + " -> " + rsMetadata.getColumnName(i));
    }
    //Throw ResultSet into a List of Maps
    //Create a List of Maps
    List<Map<String, Object>> list = new ArrayList<>();
    ResultSetMetaData rsMdata = resultSet.getMetaData();

    int colCount = rsMdata.getColumnCount();

    while(resultSet.next()) {
        Map<String, Object> rowMap = new HashMap<>();

        for(int col = 1; col <= colCount; col++) {
            rowMap.put(rsMdata.getColumnName(col), resultSet.getObject(col));
        }
        list.add(rowMap);
    }

    //print all Employees ID from a list of maps
    for (Map<String, Object> emp: list) {
        System.out.println(emp.get("EMPLOYEE_ID"));
    }
    resultSet.close();
    statement.close();
    connection.close();
}

```

SQL QUERIES

Sql Queries

Toad

SQL Developer

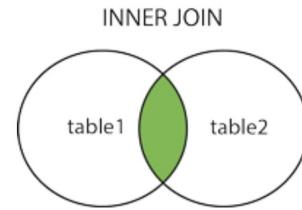
SQL

INNER JOIN Syntax

JOINS
Inner Join

```
SELECT column_name(s)
FROM table1
```

```
INNER JOIN table2 ON table1.column_name = table2.column_name;
```



Examples:

Table ORDERS

OrderID	CustomerID	EmployeeID	OrderDate	ShipperID
10308	2	7	1996-09-18	3
10309	37	3	1996-09-19	1
10310	77	8	1996-09-20	2

Table CUSTOMERS

CustomerID	CustomerName	ContactName	Address	City	PostalCode	Country
1	Alfreds Futterkiste	Maria Anders	Obere Str. 57	Berlin	12209	Germany
2	Ana Trujillo Emparedados y helados	Ana Trujillo	Avda. de la Constitución 2222	México D.F.	05021	Mexico
3	Antonio Moreno Taquería	Antonio Moreno	Mataderos 2312	México D.F.	05023	Mexico

```
SELECT Orders.OrderID, Customers.CustomerName
FROM Orders
INNER JOIN Customers ON Orders.CustomerID =Customers.CustomerID;
```

Result:

Number of Records: 196

OrderID	CustomerName
10308	Ana Trujillo Emparedados y helados
10309	Hungry Owl All-Night Grocers
10310	The Big Cheese
10311	Du monde entier
10312	Die Wandernde Kuh
10313	QUICK-Stop
10314	Rattlesnake Canyon Grocery
10315	Island Trading
10316	Rattlesnake Canyon Grocery

Left Join SQL

LEFT JOIN

```
SELECT column_name(s)
FROM table1
LEFT JOIN table2 ON table1.column_name = table2.column_name;
```

Examples:

Table Customers

CustomerID	CustomerName	ContactName	Address	City	PostalCode	Country
1	Alfreds Futterkiste	Maria Anders	Obere Str. 57	Berlin	12209	Germany
2	Ana Trujillo Emparedados y helados	Ana Trujillo	Avda. de la Constitución 2222	México D.F.	05021	Mexico
3	Antonio Moreno Taquería	Antonio Moreno	Mataderos 2312	México D.F.	05023	Mexico

Table Orders

OrderID	CustomerID	EmployeeID	OrderDate	ShipperID
10308	2	7	1996-09-18	3
10309	37	3	1996-09-19	1
10310	77	8	1996-09-20	2

QUERY:

```
SELECT Customers.CustomerName, Orders.OrderID
FROM Customers
LEFT JOIN Orders
ON Customers.CustomerID=Orders.CustomerID
ORDER BY Customers.CustomerName;
```

Result:

Number of Records: 213

CustomerName	OrderID
Alfreds Futterkiste	null
Ana Trujillo Emparedados y helados	10308
Antonio Moreno Taquería	10365
Around the Horn	10355
Around the Horn	10383
B's Beverages	10289
Berglunds snabbköp	10278
Berglunds snabbköp	10280
Berglunds snabbköp	10384
Blauer See Delikatessen	null
Blondel père et fils	10265

Right Join SQL

Right JOINS

```

SELECT column_name(s)
FROM table1
RIGHT JOIN table2 ON table1.column_name = table2.column_name;
    
```

Examples:

Table ORDERS

OrderID	CustomerID	EmployeeID	OrderDate	ShipperID
10308	2	7	1996-09-18	3
10309	37	3	1996-09-19	1
10310	77	8	1996-09-20	2

Table EMPLOYEES

EmployeeID	LastName	FirstName	BirthDate	Photo
1	Davolio	Nancy	12/8/1968	EmplD1.pic
2	Fuller	Andrew	2/19/1952	EmplD2.pic
3	Leverling	Janet	8/30/1963	EmplD3.pic

QUERY:

```

SELECT Orders.OrderID, Employees.LastName, Employees.FirstName
FROM Orders
    
```

RIGHT JOIN Employees

```

ON Orders.EmployeeID = Employees.EmployeeID
ORDER BY Orders.OrderID;
    
```

Result:

10257	Peacock	Margaret
10258	Davolio	Nancy
10259	Peacock	Margaret
10260	Peacock	Margaret
10261	Peacock	Margaret
10262	Callahan	Laura
10263	Dodsworth	Anne
10264	Suyama	Michael
10265	Fuller	Andrew
10266	Leverling	Janet

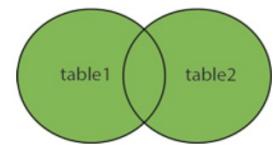
Full Join SQL

FULL JOINS

```
SELECT column_name(s)
FROM table1
```

```
FULL OUTER JOIN table2 ON table1.column_name = table2.column_name;
```

FULL OUTER JOIN



Examples:

Table CUSTOMERS

CustomerID	CustomerName	ContactName	Address	City	PostalCode	Country
1	Alfreds Futterkiste	Maria Anders	Obere Str. 57	Berlin	12209	Germany
2	Ana Trujillo Emparedados y helados	Ana Trujillo	Avda. de la Constitución 2222	México D.F.	05021	Mexico
3	Antonio Moreno Taquería	Antonio Moreno	Mataderos 2312	México D.F.	05023	Mexico

Table ORDERS

OrderID	CustomerID	EmployeeID	OrderDate	ShipperID
10308	2	7	1996-09-18	3
10309	37	3	1996-09-19	1
10310	77	8	1996-09-20	2

QUERY:

```
SELECT Customers.CustomerName, Orders.OrderID
FROM Customers
FULL OUTER JOIN Orders ON Customers.CustomerID=Orders.CustomerID
ORDER BY Customers.CustomerName;
```

CustomerName	OrderID
Alfreds Futterkiste	
Ana Trujillo Emparedados y helados	10308
Antonio Moreno Taquería	10365
	10382
	10351

SELF JOIN

FULL JOINS

```
SELECT column_name(s)
FROM table1 T1, table1 T2
WHERE condition;
```

Examples:

Table CUSTOMERS

CustomerID	CustomerName	ContactName	Address	City	PostalCode	Country
1	Alfreds Futterkiste	Maria Anders	Obere Str. 57	Berlin	12209	Germany
2	Ana Trujillo Emparedados y helados	Ana Trujillo	Avda. de la Constitución 2222	México D.F.	05021	Mexico
3	Antonio Moreno Taquería	Antonio Moreno	Mataderos 2312	México D.F.	05023	Mexico

QUERY:

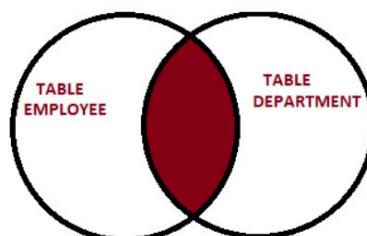
```
SELECT A.CustomerName AS CustomerName1, B.CustomerName AS
CustomerName2, A.City
FROM Customers A, Customers B
WHERE A.CustomerID <> B.CustomerID
AND A.City = B.City

ORDER BY A.City;
```

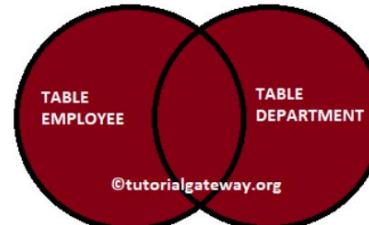
Result:

Number of Records: 88		
CustomerName1	CustomerName2	City
Cactus Comidas para llevar	Océano Atlántico Ltda.	Buenos Aires
Cactus Comidas para llevar	Rancho grande	Buenos Aires
Océano Atlántico Ltda.	Cactus Comidas para llevar	Buenos Aires
Océano Atlántico Ltda.	Rancho grande	Buenos Aires
Rancho grande	Cactus Comidas para llevar	Buenos Aires
Rancho grande	Océano Atlántico Ltda.	Buenos Aires
Furia Bacalhau e Frutos do Mar	Princesa Isabel Vinhoss	Lisboa
Princesa Isabel Vinhoss	Furia Bacalhau e Frutos do Mar	Lisboa
Around the Horn	B's Beverages	London
Around the Horn	Consolidated Holdings	London

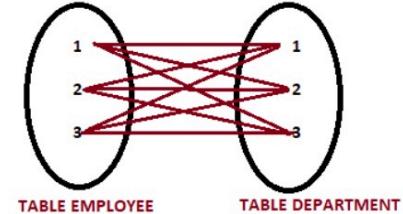
INNER JOIN EXAMPLE



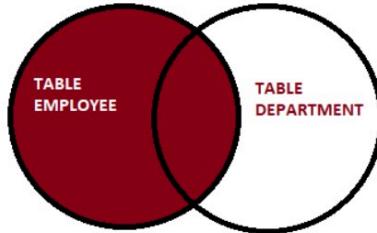
FULL JOIN EXAMPLE



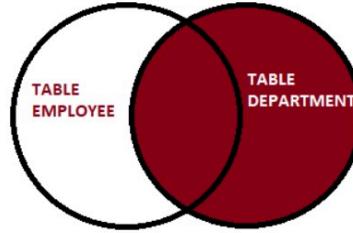
CROSS JOIN EXAMPLE



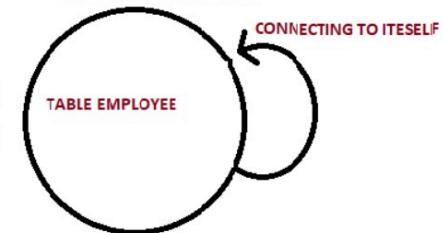
LEFT JOIN EXAMPLE



RIGHT JOIN EXAMPLE



SELF JOIN EXAMPLE



SQL-DEVELOPER QUERIES

-- write a query that will print the count of employees working in department id 10

```
select count(*)  
from employees  
where department_id=100;
```

-- write a query that will return employee first name and salary records. return employee

-- details even if the salary record is not present for the employee

```
select e.first_name, s.manager_id  
from employees e join departments s  
on e.department_id = s.department_id;
```

-- query to fetch all employees who are also managers from employees table

```
select distinct e.first_name, e.employee_id, m.manager_id  
from employees e  
inner join employees m  
on e.employee_id = m.manager_id;
```

-- Get employee details from employee table

-- whose employee name are not "John" and "Roy"

```
select * from employees  
where first_name not in ('John','Roy');
```

-- Get first name, last name and department id from employees

-- who work on department id 100 and first name Starts with J.

```
select first_name, last_name, DEPARTMENT_ID  
from employees  
where DEPARTMENT_ID=100  
and FIRST_NAME like 'J%';
```

-- Get department,no of employees in a department,total salary with respect

-- to a department from employee table order by total salary descending

```
select department_id, count(first_name) employee_count, sum(salary) Total_Salary  
from employees group by DEPARTMENT_ID order by Total_Salary desc;
```

Getting & Creating Projects

Command	Description
<code>git init</code>	Initialize a local Git repository
<code>git clone ssh://git@github.com/[username]/[repository-name].git</code>	Create a local copy of a remote repository

Basic Snapshotting

Command	Description
<code>git status</code>	Check status
<code>git add [file-name.txt]</code>	Add a file to the staging area
<code>git add -A</code>	Add all new and changed files to the staging area
<code>git commit -m "[commit message]"</code>	Commit changes
<code>git rm -r [file-name.txt]</code>	Remove a file (or folder)

Branching & Merging

Command	Description
<code>git branch</code>	List branches (the asterisk denotes the current branch)
<code>git branch -a</code>	List all branches (local and remote)
<code>git branch [branch name]</code>	Create a new branch
<code>git branch -d [branch name]</code>	Delete a branch
<code>git push origin --delete [branchName]</code>	Delete a remote branch
<code>git checkout -b [branch name]</code>	Create a new branch and switch to it
<code>git checkout -b [branch name] origin/[branch name]</code>	Clone a remote branch and switch to it
<code>git checkout [branch name]</code>	Switch to a branch
<code>git checkout -</code>	Switch to the branch last checked out
<code>git checkout -- [file-name.txt]</code>	Discard changes to a file
<code>git merge [branch name]</code>	Merge a branch into the active branch
<code>git merge [source branch] [target branch]</code>	Merge a branch into a target branch
<code>git stash</code>	Stash changes in a dirty working directory
<code>git stash clear</code>	Remove all stashed entries

Sharing & Updating Projects

Command	Description
<code>git push origin [branch name]</code>	Push a branch to your remote repository
<code>git push -u origin [branch name]</code>	Push changes to remote repository (and remember the branch)
<code>git push</code>	Push changes to remote repository (remembered branch)
<code>git push origin --delete [branch name]</code>	Delete a remote branch
<code>git pull</code>	Update local repository to the newest commit
<code>git pull origin [branch name]</code>	Pull changes from remote repository
<code>git remote add origin ssh://git@github.com/[username]/[repository-name].git</code>	Add a remote repository
<code>git remote set-url origin ssh://git@github.com/[username]/[repository-name].git</code>	Set a repository's origin branch to SSH

Inspection & Comparison

Command	Description
<code>git log</code>	View changes
<code>git log --summary</code>	View changes (detailed)
<code>git diff [source branch] [target branch]</code>	Preview changes before merging

