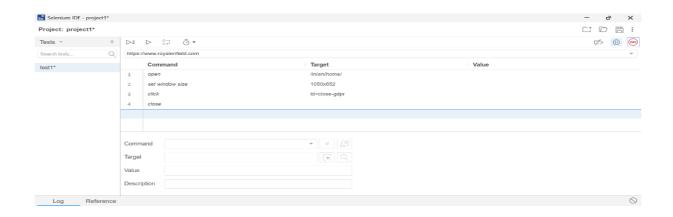
Name: - Muzeen Ashfaque Qazi

Roll No :- 23110101

Div:-B

Sub:-Lab On Software Testing

1. Using Selenium IDE, write a test suite containing minimum 4 test cases.



2. Using Selenium IDE and Eclipse, write a test case for given website [Website:- https://ghrcemj.raisoni.net]

```
public class Lab_No_2 {
  public static void main(String[] args) {
    // Set the path to chromedriver.exe
    System.setProperty("webdriver.chrome.driver", "D:\\chromedriver.exe");
    // Initialize WebDriver
     WebDriver driver = new ChromeDriver():
    // Step 1: Open the Website
    driver.get("https://ghribmjal.raisoni.net");
    // Step 2: Maximize the browser window
    driver.manage().window().maximize();
    // Step 3: Click on 'About Us'
    WebElement aboutUs = driver.findElement(By.linkText("About Us"));
     aboutUs.click();
    // Step 4: Click on 'Vision & Mission'
     WebElement visionMission = driver.findElement(By.linkText("Vision & Mission"));
    visionMission.click();
    // Step 5: Validate that "Vision & Mission" page is loaded
    WebElement heading = driver.findElement(By.tagName("h2"));
    String headingText = heading.getText();
    if (headingText.contains("Vision & Mission")) {
       System.out.println("Test Passed: Page loaded successfully.");
     } else {
       System.out.println("Test Failed: Expected heading not found.");
    // Close the browser
   driver.quit();
  Starting ChromeDriver 131.0.6778.108 ...
  ChromeDriver was started successfully.
  Test Passed: Page loaded successfully.
```

3. Using Selenium IDE and Eclipse, write a test case for given website [Gmail & Facebook]

Facebook:

```
public class Gmail_Facebook {
  public static void main(String[] args)
 throws InterruptedException {
   System.setProperty("webdriver.chrome.driver", "D:\\chromedriver.exe");
   WebDriver driver=new ChromeDriver();
   driver.get("https://www.facebook.com/login/?next=https%3A%2F%2Fwww.facebook.com%
2F");
   driver.findElement(By.id("email")).sendKeys("");
   driver.findElement(By.id("pass")).sendKeys("");
          driver.findElement(By.name("login")).click();
          Thread.sleep(2000);
          String title=driver.getTitle();
          if (title.contains("Log in"))
                  System.out.println("Login Failed");
           }
          else
          {
                  System.out.println("Login Successful");
```

Gmail:

```
public class Gmail {
   public static void main(String[] args)
   throws InterruptedException {
          // TODO Auto-generated method stub
          System.setProperty("webdriver.chrome.driver", "D:\\chromedriver.exe");
          WebDriver driver=new ChromeDriver();
   driver.get("https://accounts.google.com/v3/signin/identifier?service=mail&ddm=0&flowNam
e= Gli
fWebSignIn&flowEntry=AccountChooser&continue=https%3A%2F%2Fmail.google.com%2Fm
ai 1");
          driver.findElement(By.id("email")).sendKeys("");
          driver.findElement(By.id("pass")).sendKeys("");
          driver.findElement(By.name("login")).click();
          Thread.sleep(5000);
          String title=driver.getTitle();
          if (title.contains("Log in"))
                  System.out.println("Login Successful");
          else
                 System.out.println("Login Failed");
   }
```

Console X

terminated here [Java Application] C\Users\Admin\ p2\pooliplugins\org.eclipse.just, openydk hotupot jre.full win12.x86_64_21.07.v20250502-0916.jve\astrice
Login Successful

4. Using Selenium IDE and Eclipse, write a test case using Name, Password & Age in Selenium Server.

```
public class FormTest {
  public static void main(String[] args) {
    // Set ChromeDriver path
    System.setProperty("webdriver.chrome.driver", "C:\\path\\to\\chromedriver.exe");
    // Launch browser
     WebDriver driver = new ChromeDriver();
    try {
       // Step 1: Open form page
       driver.get("https://example.com/form");
       driver.manage().window().maximize();
       // Step 2: Enter Name
       WebElement nameField = driver.findElement(By.name("username"));
       nameField.sendKeys("Raj Sonawane");
       // Step 3: Enter Password
       WebElement passwordField = driver.findElement(By.name("password"));
       passwordField.sendKeys("Password123");
       // Step 4: Enter Age
       WebElement ageField = driver.findElement(By.name("age"));
       ageField.sendKeys("20");
       // Step 5: Click Submit button
       driver.findElement(By.name("submit")).click();
       // Step 6: Verify success message
       String successMsg = driver.findElement(By.id("success")).getText();
       if (successMsg.contains("Form submitted successfully")) {
         System.out.println("Test Passed: Form submitted successfully");
       } else {
                 System.out.println("Test Failed: Message not found");
     } catch (Exception e) {
       e.printStackTrace();
     } finally {
       // Close browser
       driver.quit();
     }
  }
}
```

Name: Raj Sonawane
Age: 20
Password:
Submit

5. Generate the test case using selenium IDE to check the program written for addition, subtraction, multiplication & division of two numbers.

```
♣ HTML
```

```
<input id="num1" type="text"><br>
   <input id="num2" type="text"><br>
   <button id="add">Add</button>
   <button id="sub">Subtract</button>
   <button id="mul">Multiply</button>
   <button id="div">Divide</button>
   <span id="result"></span>
♣ JAVA
   public class CalculatorTest {
     public static void main(String[] args) {
        // Set ChromeDriver path (update this path to your system)
        System.setProperty("webdriver.chrome.driver", "C:\\path\\to\\chromedriver.exe");
        // Launch Chrome browser
        WebDriver driver = new ChromeDriver();
        try {
          // Open calculator webpage
          driver.get("http://localhost:8080/calculator.html");
          driver.manage().window().maximize();
          // Enter numbers
          WebElement num1 = driver.findElement(By.id("num1"));
          WebElement num2 = driver.findElement(By.id("num2"));
          num1.clear();
          num1.sendKeys("20");
          num2.clear();
          num2.sendKeys("10");
           // ---- Addition Test ----
          driver.findElement(By.id("add")).click();
          String result = driver.findElement(By.id("result")).getText();
          if (result.equals("30")) {
             System.out.println("Addition Passed");
             System.out.println("Addition Failed, got: " + result);
          // ---- Subtraction Test ----
          driver.findElement(By.id("sub")).click();
          result = driver.findElement(By.id("result")).getText();
          if (result.equals("10")) {
             System.out.println("Subtraction Passed");
           } else {
```

```
System.out.println("Subtraction Failed, got: " + result);
       }
       // ---- Multiplication Test ----
       driver.findElement(By.id("mul")).click();
       result = driver.findElement(By.id("result")).getText();
       if (result.equals("200")) {
         System.out.println("Multiplication Passed");
       } else {
         System.out.println("Multiplication Failed, got: " + result);
       // ---- Division Test ----
       driver.findElement(By.id("div")).click();
       result = driver.findElement(By.id("result")).getText();
       if (result.equals("2")) {
         System.out.println("Division Passed");
       } else {
         System.out.println("Division Failed, got: " + result);
    } catch (Exception e) {
       e.printStackTrace();
    } finally {
       // Close browser
       driver.quit();
20
10
           Subtract
                             Multiply
 Add
                                             Divide
```

6. Generate the test case using selenium IDE to check the program written for to check number is Odd or Even.

```
♣ HTML
```

```
<input id="number" type="text" placeholder= "Enter a number" >
   <button id="checkBtn">Check</button>
   <span id="result"></span>
∔ JAVA
   public class OddEvenTest {
     public static void main(String[] args) {
        // Set ChromeDriver path (update this to your system path)
        System.setProperty("webdriver.chrome.driver", "C:\\path\\to\\chromedriver.exe");
        // Launch browser
        WebDriver driver = new ChromeDriver();
        try {
          // Open Odd/Even program webpage
          driver.get("http://localhost:8080/odd-even.html");
          driver.manage().window().maximize();
          // ----- Test with Even Number (10) ------
          WebElement inputBox = driver.findElement(By.id("number"));
          inputBox.clear();
          inputBox.sendKeys("10");
          driver.findElement(By.id("checkBtn")).click();
          String result = driver.findElement(By.id("result")).getText();
          if (result.equals("10 is Even")) {
             System.out.println("Even Number Test Passed");
             System.out.println("Even Number Test Failed, got: " + result);
          // ----- Test with Odd Number (7) ------
          inputBox.clear();
          inputBox.sendKeys("7");
          driver.findElement(By.id("checkBtn")).click();
          result = driver.findElement(By.id("result")).getText();
          if (result.equals("7 is Odd")) {
             System.out.println("Odd Number Test Passed");
           } else {
             System.out.println("Odd Number Test Failed, got: " + result);
        } catch (Exception e) {
          e.printStackTrace();
        } finally {
          // Close the browser
          driver.quit();
       } } }
```

7. Generate the test case using selenium IDE to check the program written for to check number is Prime or Not.

```
HTML
```

```
<input id="number" type="text" placeholder= "Enter a number" >
   <button id="checkBtn">Check</button>
   <span id="result"></span>
📥 JAVA
   public class PrimeNumberTest {
     public static void main(String[] args) {
        // Set ChromeDriver path (update this path for your system)
        System.setProperty("webdriver.chrome.driver", "C:\\path\\to\\chromedriver.exe");
        // Launch browser
        WebDriver driver = new ChromeDriver();
        try {
          // Open Prime Number program webpage
          driver.get("http://localhost:8080/prime.html");
          driver.manage().window().maximize();
          // ----- Test with Prime Number (7) ------
          WebElement inputBox = driver.findElement(By.id("number"));
          inputBox.clear();
          inputBox.sendKeys("7");
          driver.findElement(By.id("checkBtn")).click();
          String result = driver.findElement(By.id("result")).getText();
          if (result.equals("7 is Prime")) {
             System.out.println("Prime Number Test Passed (7)");
             System.out.println("Prime Number Test Failed, got: " + result);
          // ----- Test with Non-Prime Number (10) ------
          inputBox.clear();
          inputBox.sendKeys("10");
          driver.findElement(By.id("checkBtn")).click();
          result = driver.findElement(By.id("result")).getText();
          if (result.equals("10 is Not Prime")) {
             System.out.println("Non-Prime Number Test Passed (10)");
           } else {
             System.out.println("Non-Prime Number Test Failed, got: " + result);
        } catch (Exception e) {
          e.printStackTrace();
        } finally {
          // Close browser
          driver.quit();
        } } }
```

8. Generate the test case using selenium IDE to check the program written for addition and subtraction of three number.

```
HTML
```

```
<input id="num1" type="text"><br><br>
   <input id="num2" type="text"><br><br>
   <input id="num3" type="text"><br><br>
   <button id="add">Add</button>
   <button id="sub">Subtract</button>
   <span id="result"></span>
📥 JAVA
   public class ThreeNumberCalcTest {
     public static void main(String[] args) {
        // Set ChromeDriver path (update with your path)
        System.setProperty("webdriver.chrome.driver", "C:\\path\\to\\chromedriver.exe");
        // Launch browser
        WebDriver driver = new ChromeDriver();
        try {
          // Open calculator program webpage
          driver.get("http://localhost:8080/threeNumbers.html");
          driver.manage().window().maximize();
          // Locate input fields
          WebElement num1 = driver.findElement(By.id("num1"));
          WebElement num2 = driver.findElement(By.id("num2"));
          WebElement num3 = driver.findElement(By.id("num3"));
          // ----- Test Addition: 10 + 20 + 30 = 60 -----
          num1.clear();
          num1.sendKeys("10");
          num2.clear();
          num2.sendKeys("20");
          num3.clear();
          num3.sendKeys("30");
          driver.findElement(By.id("add")).click();
          String result = driver.findElement(By.id("result")).getText();
          if (result.equals("60")) {
             System.out.println("Addition Test Passed (10+20+30=60)");
          } else {
             System.out.println("Addition Test Failed, got: " + result);
          }
          // ----- Test Subtraction: 50 - 20 - 10 = 20 -----
          num1.clear();
          num1.sendKeys("50");
          num2.clear();
```

```
num2.sendKeys("20");
    num3.clear();
    num3.sendKeys("10");
    driver.findElement(By.id("sub")).click();
    result = driver.findElement(By.id("result")).getText();
    if (result.equals("20")) {
      System.out.println("Subtraction Test Passed (50-20-10=20)");
    } else {
      System.out.println("Subtraction Test Failed, got: " + result);
  } catch (Exception e) {
    e.printStackTrace();
  } finally {
    // Close browser
    driver.quit();
  }
10
20
30
 Add
            Subtract
```

9. Generate the test case using selenium IDE to check the program written for multiplication and division of three number.

```
HTML
```

```
<input id="num1" type="text"><br><br>
   <input id="num2" type="text"><br><br>
   <input id="num3" type="text"><br><br>
   <button id="add">Add</button>
   <button id="sub">Subtract</button>
   <span id="result"></span>
♣ JAVA
   public class ThreeNumberMulDivTest {
     public static void main(String[] args) {
        // Set ChromeDriver path (update to your system's path)
        System.setProperty("webdriver.chrome.driver", "C:\\path\\to\\chromedriver.exe");
        // Launch browser
        WebDriver driver = new ChromeDriver();
        try {
          // Open the calculator program
          driver.get("http://localhost:8080/threeNumbersCalc.html");
          driver.manage().window().maximize();
          // Locate input fields
          WebElement num1 = driver.findElement(By.id("num1"));
          WebElement num2 = driver.findElement(By.id("num2"));
          WebElement num3 = driver.findElement(By.id("num3"));
          // ----- Test Multiplication: 2 * 3 * 4 = 24 -----
          num1.clear();
          num1.sendKeys("2");
          num2.clear();
          num2.sendKeys("3");
          num3.clear();
          num3.sendKeys("4");
          driver.findElement(By.id("mul")).click();
          String result = driver.findElement(By.id("result")).getText();
          if (result.equals("24")) {
             System.out.println("Multiplication Test Passed (2*3*4=24)");
          } else {
             System.out.println("Multiplication Test Failed, got: " + result);
          // ----- Test Division: 100 / 5 / 2 = 10 -----
          num1.clear();
          num1.sendKeys("100");
```

```
num2.clear();
    num2.sendKeys("5");
    num3.clear();
    num3.sendKeys("2");
    driver.findElement(By.id("div")).click();
    result = driver.findElement(By.id("result")).getText();
    if (result.equals("10")) {
      System.out.println("Division Test Passed (100/5/2=10)");
    } else {
      System.out.println("Division Test Failed, got: " + result);
    }
  } catch (Exception e) {
    e.printStackTrace();
  } finally {
    // Close browser
    driver.quit();
2
3
              Subtract
 Add
```

10. Using Selenium IDE and Eclipse demonstrate Unit Testing with Junit.

```
public class SeleniumDemo {
  // Declare the WebDriver instance as static so it can be used in @BeforeClass and
@AfterClass
  public static WebDriver driver;
  @BeforeClass
  public static void initDriver() {
    // NOTE: You must change this path to the actual location of your chromedriver.exe
    String path = System.getProperty("user.dir") + "\\Driver\\chromedriver.exe";
    // Setting the path to the ChromeDriver executable
    System.setProperty("webdriver.chrome.driver", path);
    // Initialize the ChromeDriver
    driver = new ChromeDriver();
    // Maximize the browser window
    driver.manage().window().maximize();
    // Navigate to the target URL
    driver.get("http://www.tutorialspoint.com/");
  }
  @Test
  public void verifyTitle() {
    System.out.println("In Verify Title Test Case");
    // Get the page title
    String title = driver.getTitle();
    // Assert that the title contains the text "Test and Video"
    // This is the assertion shown in the screenshot
    assertTrue(title.contains("Test and Video"));
  }
  //-----
```

```
@Test
      public void verifyHeading() {
           System.out.println("In Verifying Heading Test Above Search Test Case");
           // The expected text for the heading element
           String expectedSearchHeading = "Enjoy theory and lab at the same time, right here online!
           // Find the element by XPath and get its text
           // NOTE: The XPath is highly specific and likely needs adjustment for current website
 content
           String actualHeading =
 driver.findElement(By.xpath("/html/body/div[3]/div[1]/div/div[2]/h2")).getText();
           // Assert that the actual text matches the expected text
           // This is the assertion shown in the screenshot
           assertEquals(expectedSearchHeading, actualHeading);
      //-----
       @AfterClass
      public static void tearDown() {
           // Quit the driver and close all associated windows after all tests are done
           if (driver != null) {
               driver.quit();
  }
Elle Edit Source Refactor Navigate Search Project Run Window Help
 13 anished after 6 (3)) seconds 14
Runs: 2/2 Berrors: 0 P Failures: 0 16
16
17
26 SeleniumDemo (Runnes: Julist 4) (1330 8)
30 verifyTitle ((3001.5) 19
30 verifyHeading ((1,329.6) 22
23
24
25
26
27
28
29
30
                                @BeforeClass
public static void initDriver() {
   String path = System.getProperty("user.dir");
   System.setProperty("webdriver.chrome.driver", path + "\\Driver\\chromedriver.exe");
   driver = new.ChromeDriver();
   driver.anaage().window().maxximize();
   driver.get("http://www.tutorialspoint.com/");
}
                                 @lest
public void verifyTitle() {
   System.out.println("In Verify Title Test Case");
   String title = driver.getTitle();
   assertTrue(title.contains("Text and Video"));
                                @Test
public void verifyHeading() {
    System.out.println("In Verify Heading Text Above Search Test Case");
    String expectedearchHeading = " Enjoy theory and lab at the same time, right here online! ";
    String actualHeading = driver.findElement(By.yparth("html/body/div[3]/div[1]/div/div/div/h2")).getText{);
    assertEquals(expectedearchHeading, actualHeading);
}
                                 @AfterClass
```

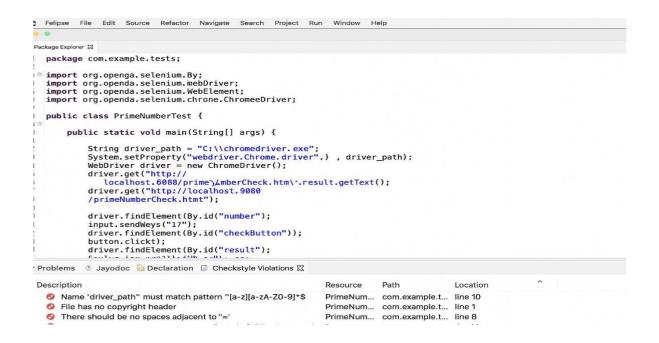
□ Console 88

In Verify Title Test Case
In Verify Heading Text Above Search Test

<terminated>SeleniumDemo[Unit] C.Program Files\Javajie1.80_144\bin\javaw.exe (Sep 5, 2017, 1:5007 PM)
Starting ChromeDriver 2.30.477700 (0057494ad8732195794a7b32078424f92a5fce41) on port 15620
Only local connections are allowed.

11. Using Selenium IDE and Eclipse perform Static Code Analysis Using Check style.

```
public class PrimeNumberTest {
  public static void main(String[] args) {
    // WebDriver path not following naming conventions (violation)
    String driver_path="C:\\chromedriver.exe";
    // Missing comments/Javadoc (violation)
    System.setProperty("webdriver.chrome.driver", driver_path);
     WebDriver driver=new ChromeDriver();
    driver.get("http://localhost:8080/primeNumberCheck.html");
     WebElement input=driver.findElement(By.id("number"));
    input.sendKeys("17"); // No space around operators (violation)
     WebElement button=driver.findElement(By.id("checkButton"));
    button.click();
     WebElement result=driver.findElement(By.id("result"));
    System.out.println("Result:"+result.getText()); // concatenation spacing issue (violation)
     driver.quit();
}
```



12. Using Selenium IDE and Eclipse perform Black Box Testing (Create an Login module)

```
🖶 HTML
   <!DOCTYPE html>
   <html>
   <head>
   <title>Login Page</title>
   </head>
   <body>
    <h2>Login Module</h2>
    <form id="loginForm">
     <label>Username:</label>
     <input type="text" id="username"><br><br>
     <label>Password:</label>
     <input type="password" id="password"><br><br>
     <button type="button" id="loginButton">Login</button>
    </form>
    <script>
     document.getElementById("loginButton").onclick = function() {
      var user = document.getElementById("username").value;
      var pass = document.getElementById("password").value;
      if(user === "admin" && pass === "12345"){
       document.getElementById("message").innerText = "Login Successful!";
       } else {
       document.getElementById("message").innerText = "Invalid Credentials!";
     };
    </script>
   </body>
   </html>
🖶 Java
   public class LoginTest {
     public static void main(String[] args) {
       System.setProperty("webdriver.chrome.driver", "C:\\chromedriver.exe");
       WebDriver driver = new ChromeDriver();
       driver.get("http://localhost:8080/login.html");
```

// Test Case 1: Valid Login

driver.findElement(By.id("username")).sendKeys("admin"); driver.findElement(By.id("password")).sendKeys("12345");

```
driver.findElement(By.id("loginButton")).click();

WebElement message = driver.findElement(By.id("message"));
System.out.println("Valid Login Test Result: " + message.getText());

// Test Case 2: Invalid Login
driver.navigate().refresh(); // reset form
driver.findElement(By.id("username")).sendKeys("wrong");
driver.findElement(By.id("password")).sendKeys("0000");
driver.findElement(By.id("loginButton")).click();
WebElement message2 = driver.findElement(By.id("message"));
System.out.println("Invalid Login Test Result: " + message2.getText());
driver.quit();
}
```

Login Module

Username:	
admin	
Password:	
12345	
Login	
Login Successfull	

13. Using Selenium IDE and Eclipse perform White Box Testing Branch coverage.

Login Validation

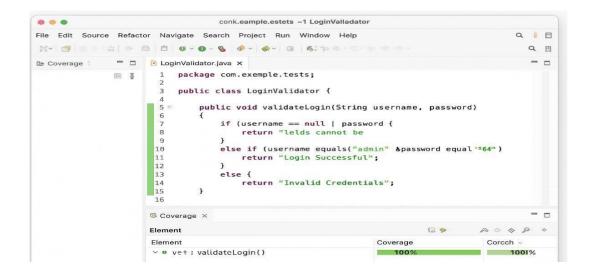
```
public class LoginValidator {
   public String validateLogin(String username, String password) {
     if (username == null || password == null) {
        return "Fields cannot be empty";
     } else if (username.equals("admin") && password.equals("12345")) {
        return "Login Successful";
     } else {
        return "Invalid Credentials";
     }
}
```

4 All Branches

```
public class LoginValidatorTest {
    @Test
    public void testNullValues() {
        LoginValidator lv = new LoginValidator();
        assertEquals("Fields cannot be empty", lv.validateLogin(null, null));
    }

    @Test
    public void testValidLogin() {
        LoginValidator lv = new LoginValidator();
        assertEquals("Login Successful", lv.validateLogin("admin", "12345"));
    }

    @Test
    public void testInvalidLogin() {
        LoginValidator lv = new LoginValidator();
        assertEquals("Invalid Credentials", lv.validateLogin("wrong", "0000"));
    }
}
```



14. Using Selenium IDE and Eclipse perform Security Testing Simulate SQL injection.

♣ SQL

```
open /vulnerable/login
   waitForElementPresent css=input[name="username"]
                                                           5000
   type css=input[name="username"]
                                        'OR '1'='1' --
   type css=input[name="password"] randompassword
   click css=button[type="submit"]
   waitForPageToLoad
                         5000
   storeTitle pageTitle
          Sent payload: 'OR '1'='1' --
   echo
         Page title after submit: ${pageTitle}
   echo
🚣 JAVA
   public class SqlInjectionTest {
     public static void main(String[] args) {
        System.out.println("Starting SqlInjectionTest...");
        // Use WebDriverManager to auto-manage chromedriver
        WebDriverManager.chromedriver().setup();
        WebDriver driver = new ChromeDriver();
        try {
          String baseUrl = "http://localhost:8080/vulnerable/login"; // change to your test
   target
          System.out.println("Navigated to " + baseUrl);
          driver.get(baseUrl);
          // Locate fields - adjust selectors to your page
          WebElement username = driver.findElement(By.name("username"));
          WebElement password = driver.findElement(By.name("password"));
          WebElement submit =
   driver.findElement(By.cssSelector("button[type='submit']"));
          String payload = "' OR '1'='1' -- ";
          username.clear();
          username.sendKeys(payload);
          password.clear();
          password.sendKeys("irrelevant");
          System.out.println("Sent payload: " + payload);
          submit.click();
          // Wait a short moment for navigation/response
          Thread.sleep(3000);
```

```
String title = driver.getTitle();
       System.out.println("Page title after submit: " + title);
       // Heuristic: if title contains "Welcome" or "Dashboard" it may indicate bypass
       if (title.toLowerCase().contains("welcome") ||
title.toLowerCase().contains("dashboard")) {
          System.out.println("Possible vulnerability: SQL injection success (test
environment)");
       } else {
          System.out.println("No obvious success indicator in title. Manual inspection
recommended.");
       }
     } catch (Exception e) {
       e.printStackTrace();
     } finally {
       driver.quit();
       System.out.println("Test finished.");
```

```
Starting SqlInjectionTest...

Naviated to http:/loclost.8000/vulentable/login
Sent payload: 'OR '1"='1' — -
Page title after submit: Welcome, admin
Possible vulerabilily: SQL injection
success (test environment)
Test finished
```

15. Using Selenium IDE and Eclipse check performance Testing with JMH.

```
♣ JHM
```

```
<dependencies>
     <!-- Selenium -->
     <dependency>
        <groupId>org.seleniumhq.selenium
        <artifactId>selenium-java</artifactId>
        <version>4.14.0</version>
     </dependency>
     <!-- WebDriverManager (optional, manages chromedriver) -->
     <dependency>
        <groupId>io.github.bonigarcia/groupId>
       <artifactId>webdrivermanager</artifactId>
        <version>5.5.0</version>
     </dependency>
     <!-- JMH core -->
     <dependency>
       <groupId>org.openjdk.jmh</groupId>
       <artifactId>jmh-core</artifactId>
       <version>1.38</version>
     </dependency>
     <!-- JMH annotation processor -->
     <dependency>
        <groupId>org.openjdk.jmh</groupId>
       <artifactId>jmh-generator-annprocess</artifactId>
        <version>1.38</version>
        <scope>provided</scope>
     </dependency>
   </dependencies>
♣ JAVA
   @BenchmarkMode(Mode.AverageTime)
                                             // Measure average execution time
   @OutputTimeUnit(TimeUnit.MILLISECONDS) // Results in ms
   @State(Scope.Thread)
                                    // Each thread gets its own WebDriver
   public class SeleniumPerformanceBenchmark {
     private WebDriver driver;
     @Setup(Level.Iteration)
     public void setup() {
       WebDriverManager.chromedriver().setup();
       driver = new ChromeDriver();
     }
     @TearDown(Level.Iteration)
     public void tearDown() {
```

```
driver.quit();
     @Benchmark
     public void testLoginPageLoad() {
        driver.get("http://localhost:8080/demo/login"); // Replace with your app
        WebElement username = driver.findElement(By.name("username"));
        WebElement password = driver.findElement(By.name("password"));
        WebElement submit = driver.findElement(By.cssSelector("button[type='submit']"));
        username.sendKeys("test");
        password.sendKeys("test123");
        submit.click();
     }
♣ FOR RUNNING BENCHMARK
   public class BenchmarkRunner {
     public static void main(String[] args)
      throws RunnerException {
        Options opt = new OptionsBuilder()
             .include(SeleniumPerformanceBenchmark.class.getSimpleName())
             .warmupIterations(1) // Warmup runs
            .measurementIterations(3) // Real measurement runs
            .forks(1)
                             // Single JVM fork
             .build();
        new Runner(opt).run();
```

```
imh-selenium - BenchmarkTest.iava - Eclipse IDE
       Q 😝 🗂 🗆
               □ □ Benchmark4est.java 38
           import or gretAggregIatoraconume s;
                       2 import org.webDriver Driver;
imh-selenium
                       3 import org.autottime.webDrivericver;

✓ D com.example

    > Benchmark Test
                       5 public class BenchmarkTest {
 > 
\[ \] JRE system.Library(Java-E
 > Maven Dependencies
                              @Setup(Level.Iteration) stetup() {
 > 🛅 drivers
                              @State(LeveLevel.Iteration() et Driver."drivvedriver.chrome.driver")
  pom.xml
                              @TearDown(Level.Iteration) {
                       10
                       11
                              publicBenchmark testHomePage) {

    Problems  
    Ø Javadoc  
    De-claration  
    Console 33

                                                   # JMH 1.37 (released 5 days ago)
                      # VM version: JDK 17.0.8, OpenJDK 64-Bit Server VM, VM, 17.0.8
                      # Warmup: 5 iterations, 1 s each
                      # Measurement: 5 iterations, 1 s each
                      BenchmarkTesttest
                                                            Mode Cnt Score Error
                                                                    5 854.320 ± 12.432
                      BenchmarkTest.testHomePageLoad avgt
```

