



IS4102 ADVANCED SOFTWARE QUALITY ASSURANCE

Assignment 2



M D M N PERERA
20020742
2020/IS/074

Table of Contents

Project Overview.....	2
Description of Key Components	2
Project Structure.....	3
Setup Instructions	4
Prerequisites.....	4
Steps to Set Up.....	4
Links	4
Presentation Link	4
Source Code Link	4
TestNG Features implemented.....	4
Annotations	4
Parallel Execution.....	5
Assertions.....	5
Cross-Browser Testing.....	5
Test Data Management and Data-Driven Testing.....	5
Error Handling and Logging	6
Additional Utilities	6
Some Screenshots capturing failures occurred during test implementation	6

Project Overview

This project is a test automation framework built using Selenium WebDriver and TestNG. It aims to automate tests for the Daraz e-commerce website, focusing on various functionalities such as searching for products, logging in, and managing user profiles. The framework uses a Page Object Model (POM) design pattern, which enhances the maintainability and scalability of the test cases.

Description of Key Components

The POM structure is utilized to separate test code from the application logic.

Pages: Contains page classes that represent different pages or components of the application. This contains the methods representing the actions that can be performed on that specific page.

e.g., DarazHomePage, DarazLoginPage -> pages

DarazNavigation -> Navigation bar

Tests: Contains test class where all the test methods are defined. Daraz.java includes various tests for functionality utilising the methods from the page classes to perform the required actions and assertions during testing.

Utilities: Contains utility classes such as ExcelUtil for reading test data from Excel file TestData.xlsx, Log for logging during tests running and Utilities for common methods used across tests for setup and teardown methods.

Resources: Contains configuration files, logging configuration, and test data files.

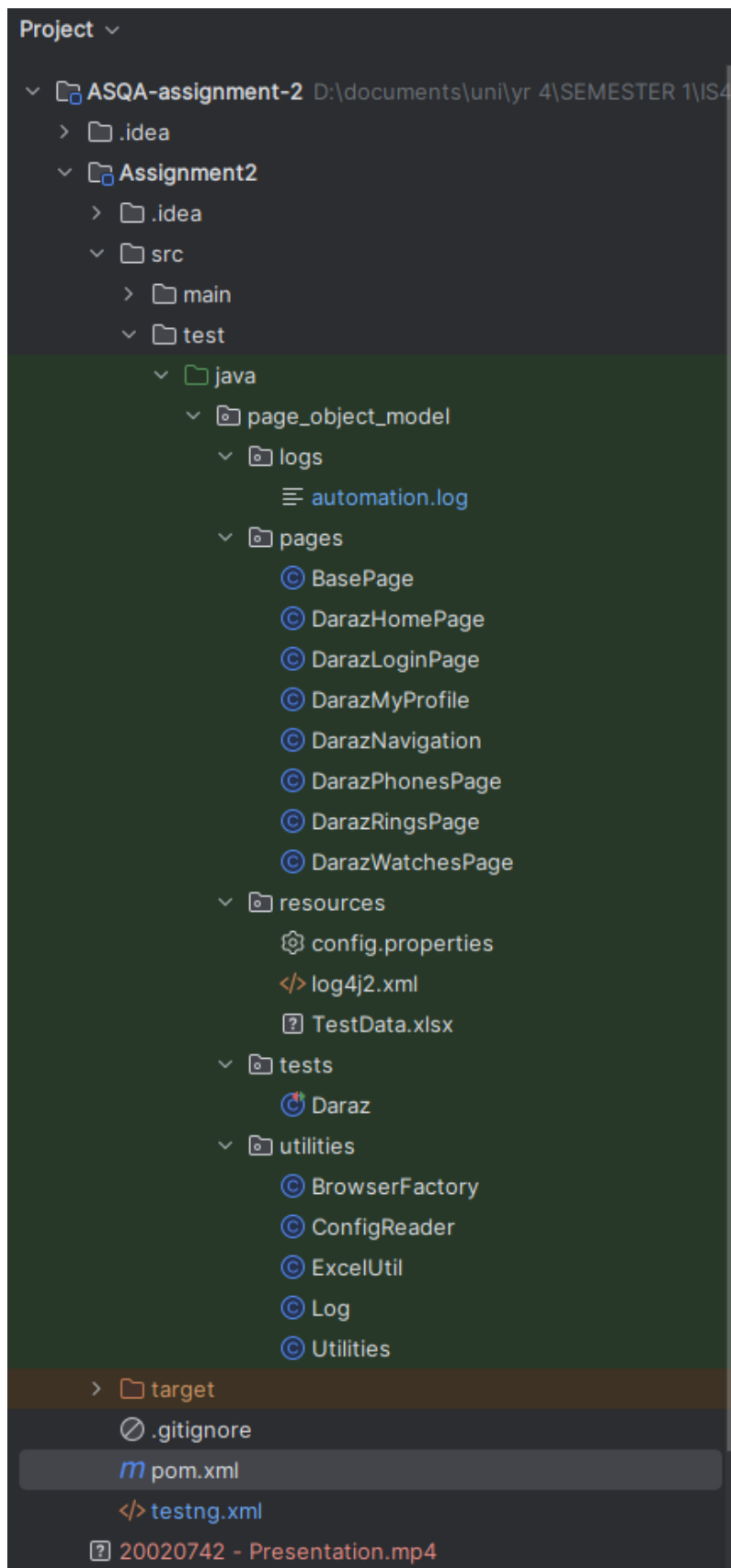
Pom.xml: Maven configuration file that specifies dependencies and project metadata.

Logging: Logging is handled using Log4j, with configurations specified in log4j2.xml. Logs are generated in both the console and a file located at src/test/java/page_object_model/logs/automation.log.

Test Data: Test data is stored in an Excel file TestData.xlsx, which is read during the execution of tests to provide inputs for login scenarios.

Testing.xml: Used for configuring and running tests. With the use of attributes like parallel and thread-count the tests are run parallelly.

Project Structure



Setup Instructions

Prerequisites

1. Java Development Kit (JDK) – install JDK and setup environment variables
2. Maven – install Maven and setup the environment variables

Steps to Set Up

1. Clone the repository to the local machine
2. Navigate to the project directory in an IDE (IntelliJ IDEA / Eclipse)
3. Install dependencies
4. Configure the environment – update the config.properties file with the wanted browser type
5. Run tests sequentially – run the file Daraz.java
6. Run tests parallelly – run the file testing.xml

Links

Presentation Link

https://drive.google.com/file/d/17BWuqpfFUq3WGGQdEVUytCzkBNsXIKePL/view?usp=drive_link

Source Code Link

<https://github.com/michellenikeetha/ASQA-assignment-2.git>

TestNG Features implemented

Annotations

@BeforeTest and @AfterTest in the Utilities.java for test setup and teardown functions.

Using the @BeforeTest annotation I have initialized the browserFactory which is then used to initialize a WebDriver instance.

Using the @AfterTest annotation the active WebDriver instance is retrieved and closes the browser ending the WebDriver session completely.

Parallel Execution

Parallel execution is configured in the testng.xml file, allowing multiple tests to run concurrently, which speeds up test execution and demonstrates scalable test automation.

In the testng.xml, parallel="methods" attributes allow methods to execute simultaneously across different browser instances.

thread-count="4" : I have specified the number of threads as 4, so 4 test methods will be run simultaneously.

Assertions

Assertions are used in my tests to verify the expected outcomes against the actual outcomes, ensuring that each step behaves as intended.

Ex:

01. In searchRings(), an assertion checks if the Cubic Zirconia checkbox is visible on the search results page.
02. In loginWithDataProvider(), an assertion checks if the "My Account" button is visible after a successful login attempt.

Cross-Browser Testing

The cross-browser setup is used to validate that the web application behaves consistently across different browsers. It ensures that elements, functionality, and layouts are uniformly accessible across popular browsers, which is essential for a high-quality user experience.

It supports Chrome, Firefox, and Edge. The browser type is configured externally using ConfigReader.java and config.properties files.

Test Data Management and Data-Driven Testing

Data-driven testing allows to run tests with multiple sets of data, which is implemented using TestNG's @DataProvider and the external test data file TestData.xlsx which contains login data for the login functionality.

The @DataProvider annotation is used to provide test data to the method loginWithDataProvider, allowing multiple login scenarios (success and failure) to be tested with different username/password combinations. The TestData.xlsx is accessed using the ExcelUtil.java file and then provides the data to the loginDataProvider method which is then used by loginWithDataProvider method.

Error Handling and Logging

Both error handling and logging is implemented in the project to make debugging and troubleshooting easier.

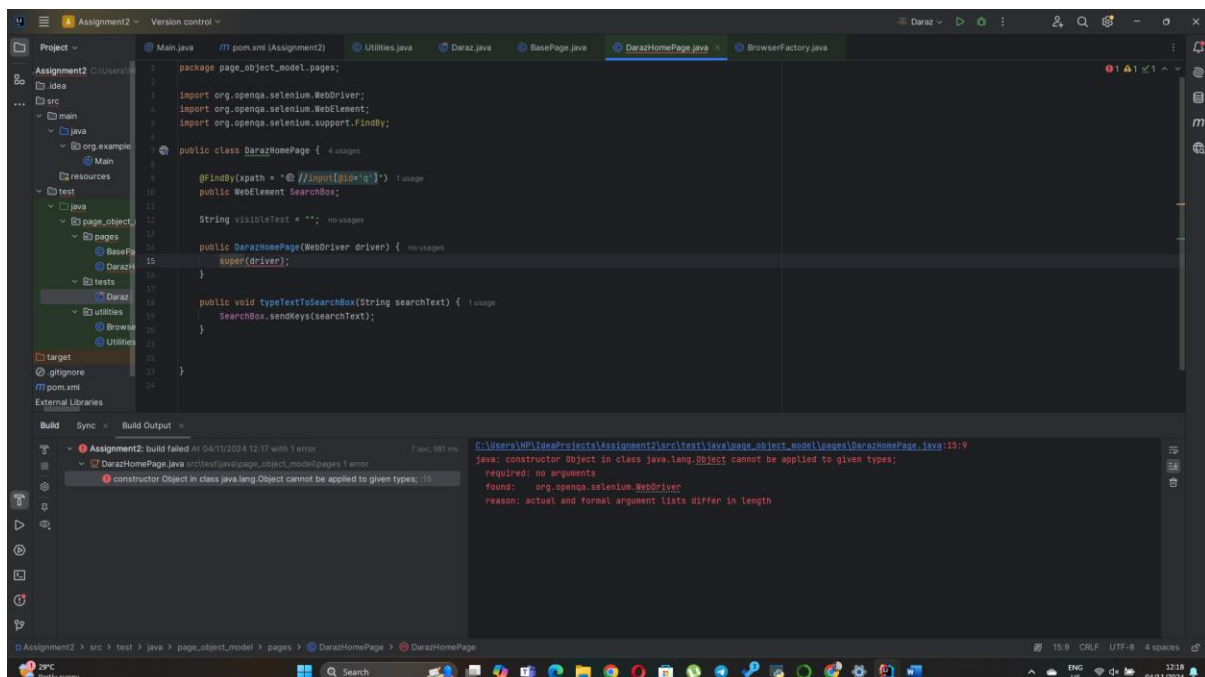
The errors are handled by using exceptions in test methods and BrowserFactory.java class and logging is done in every java class using log4j2.xml. These helps in preventing unexpected errors from crashing the tests and gives out detailed logging of any failures and other information. Logging does not directly handle errors, but it provides context which is needed for debugging the issues if arised.

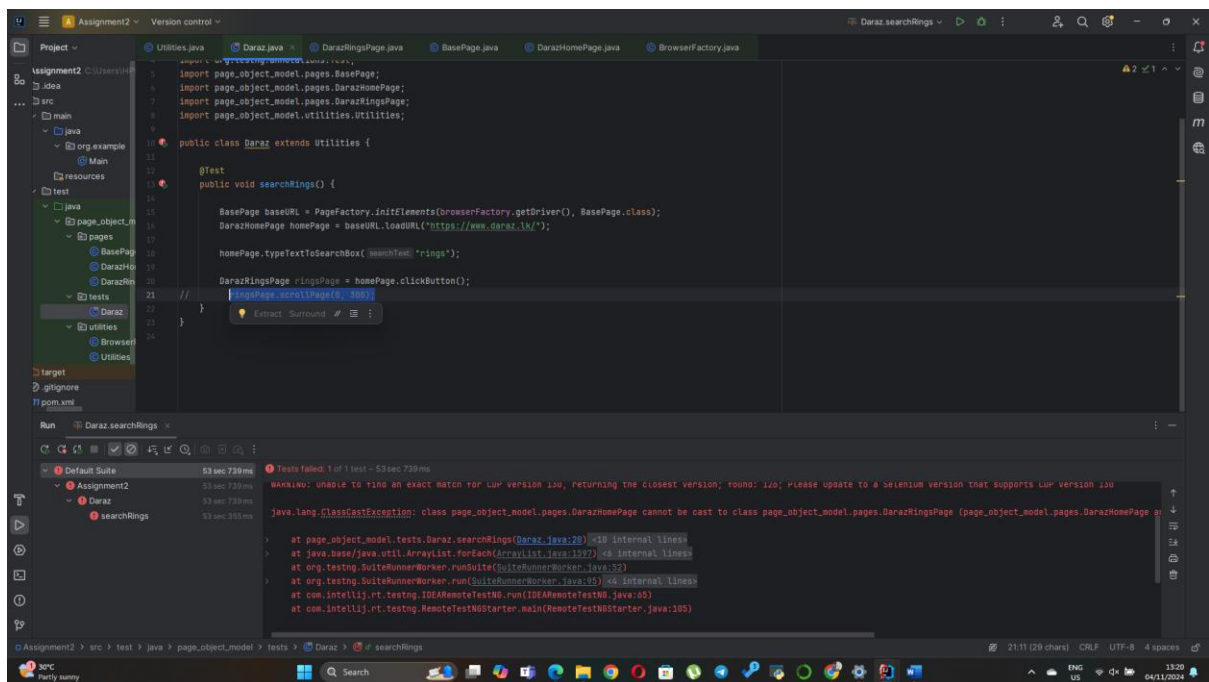
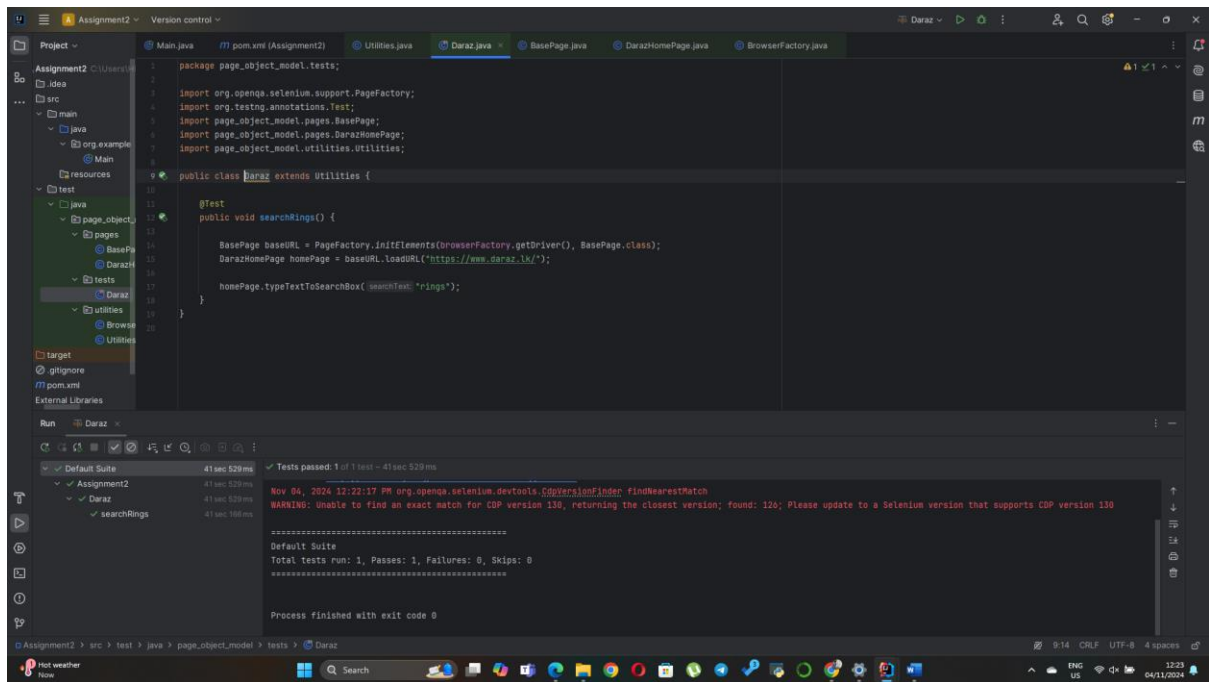
Additional Utilities

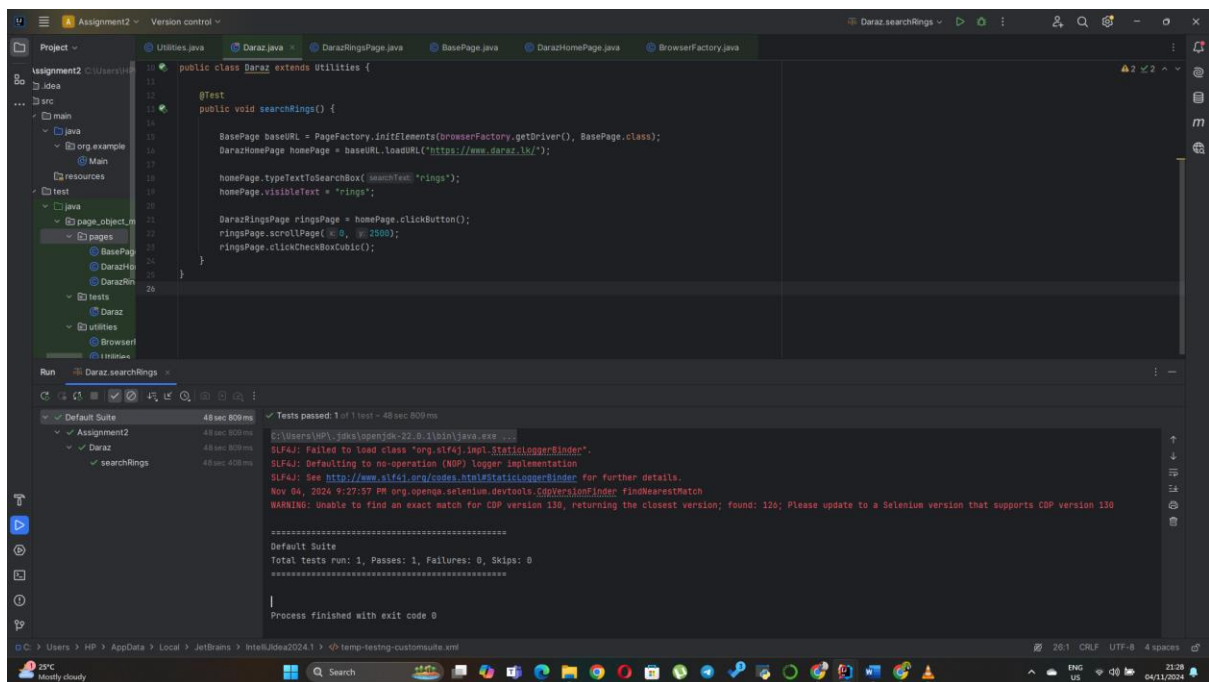
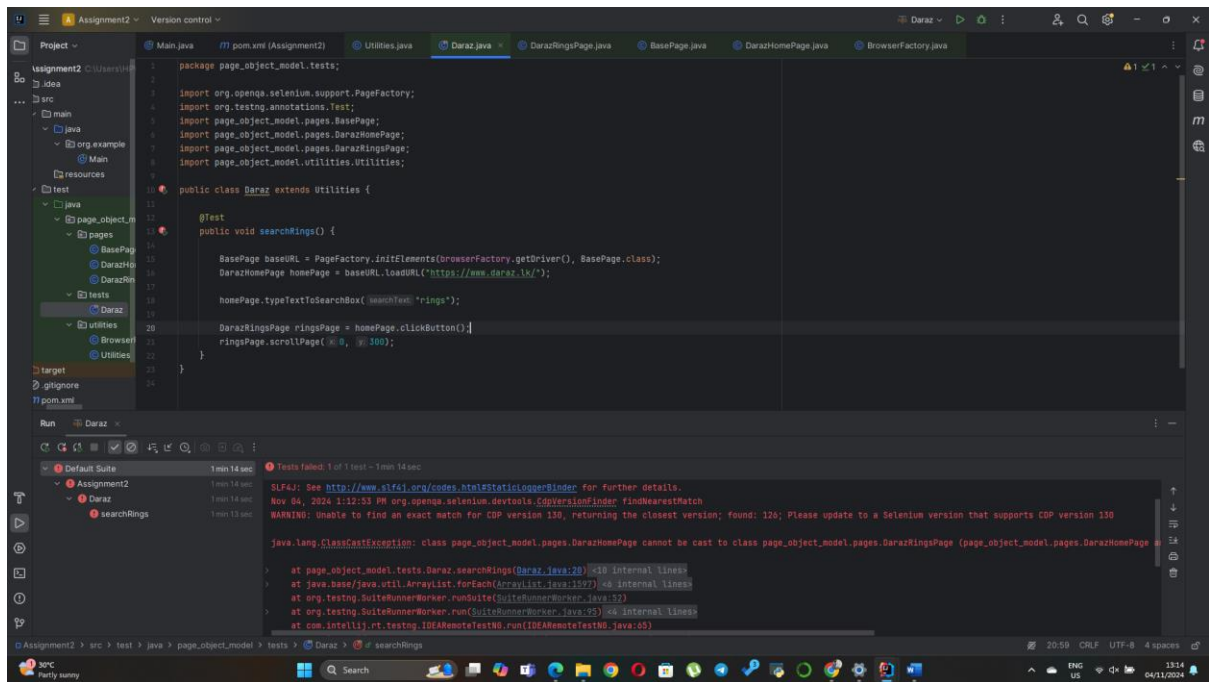
Additional utilities implemented in my project are ConfigReader.java, ExcelUtil.java and Log.java

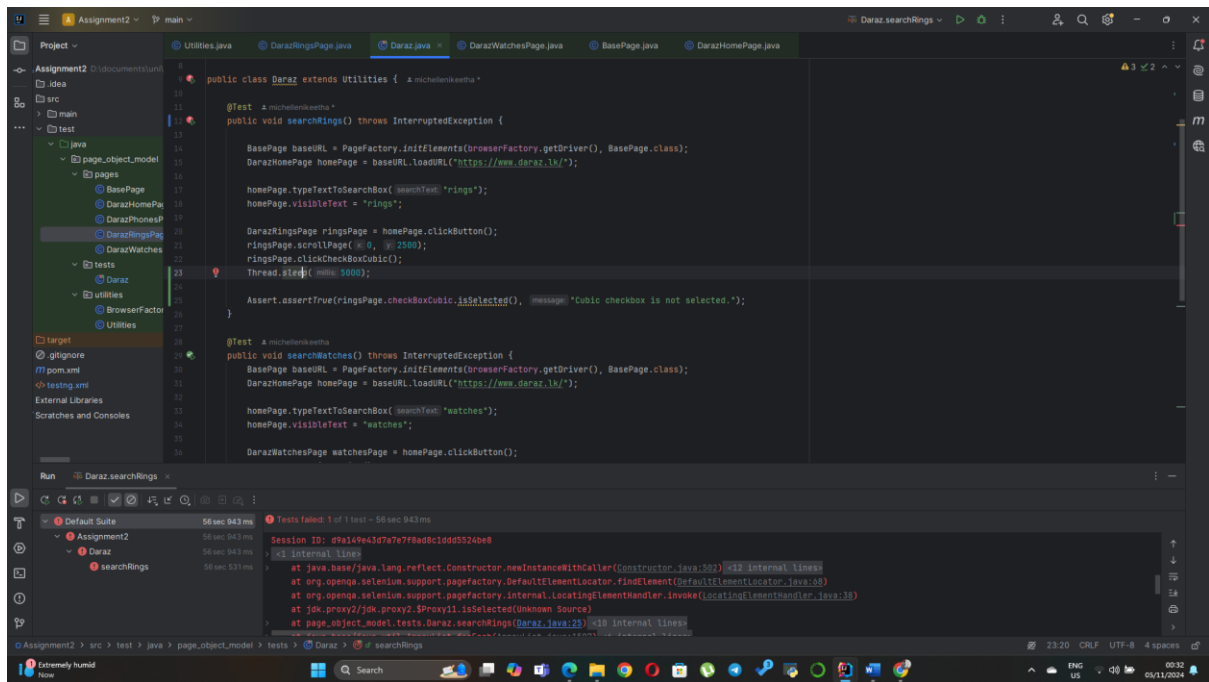
Some Screenshots capturing failures occurred during test implementation

searchRings

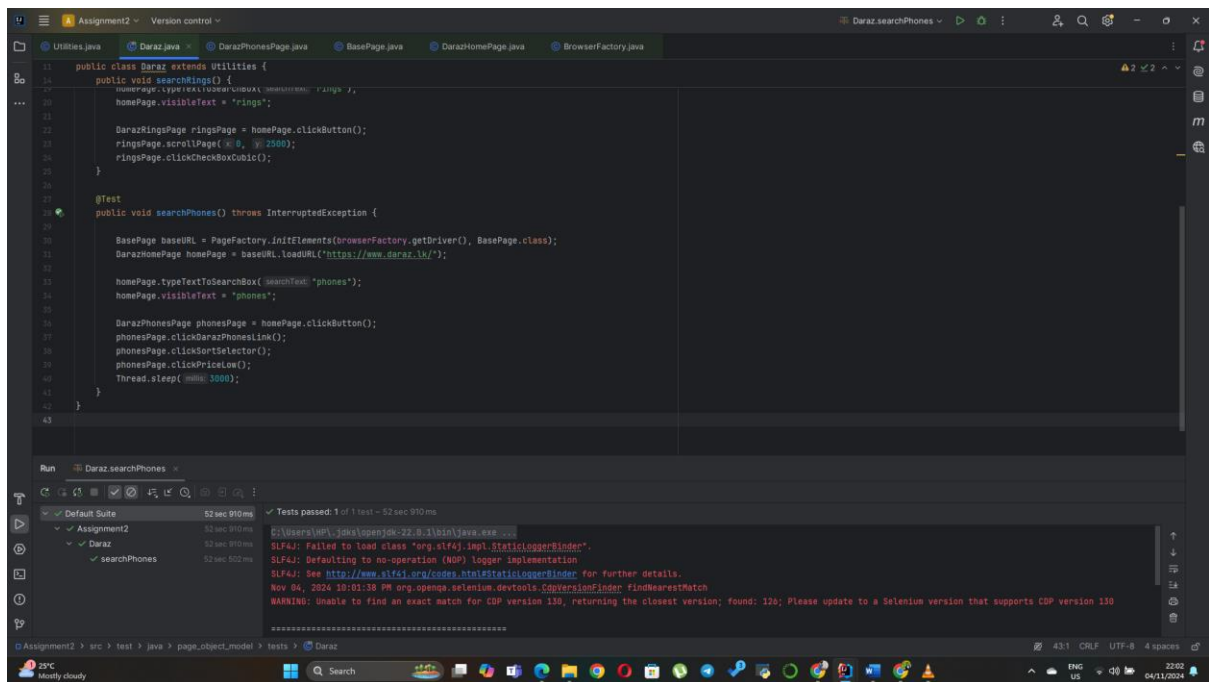


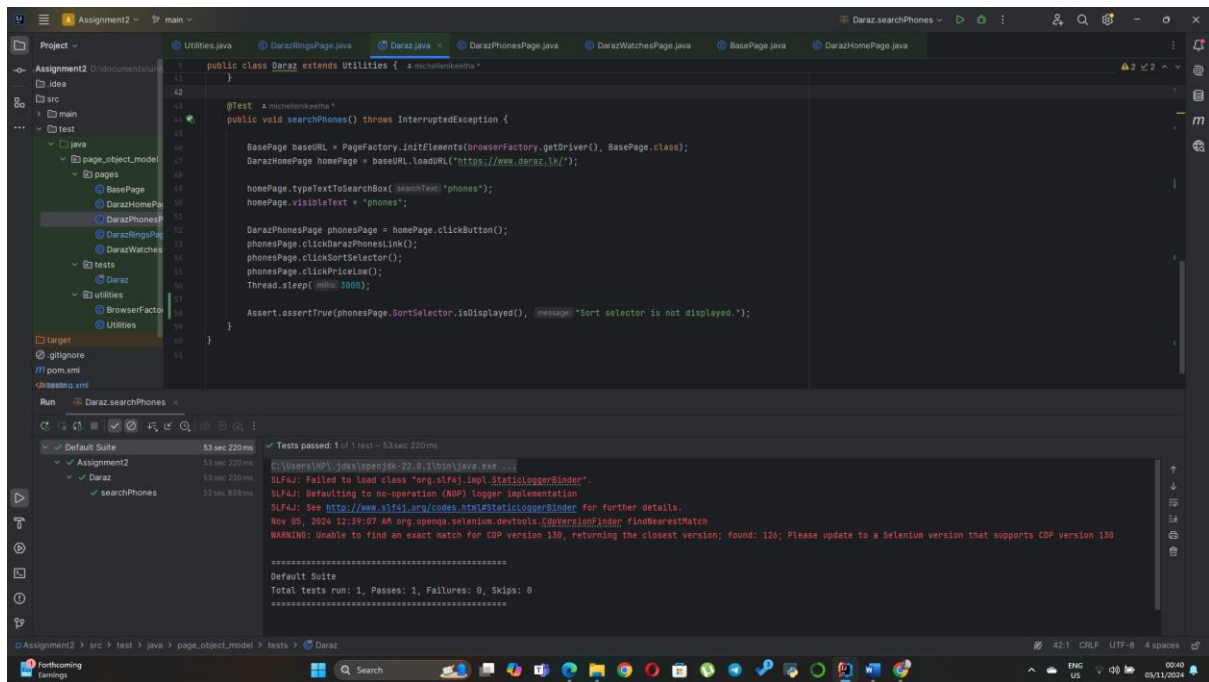




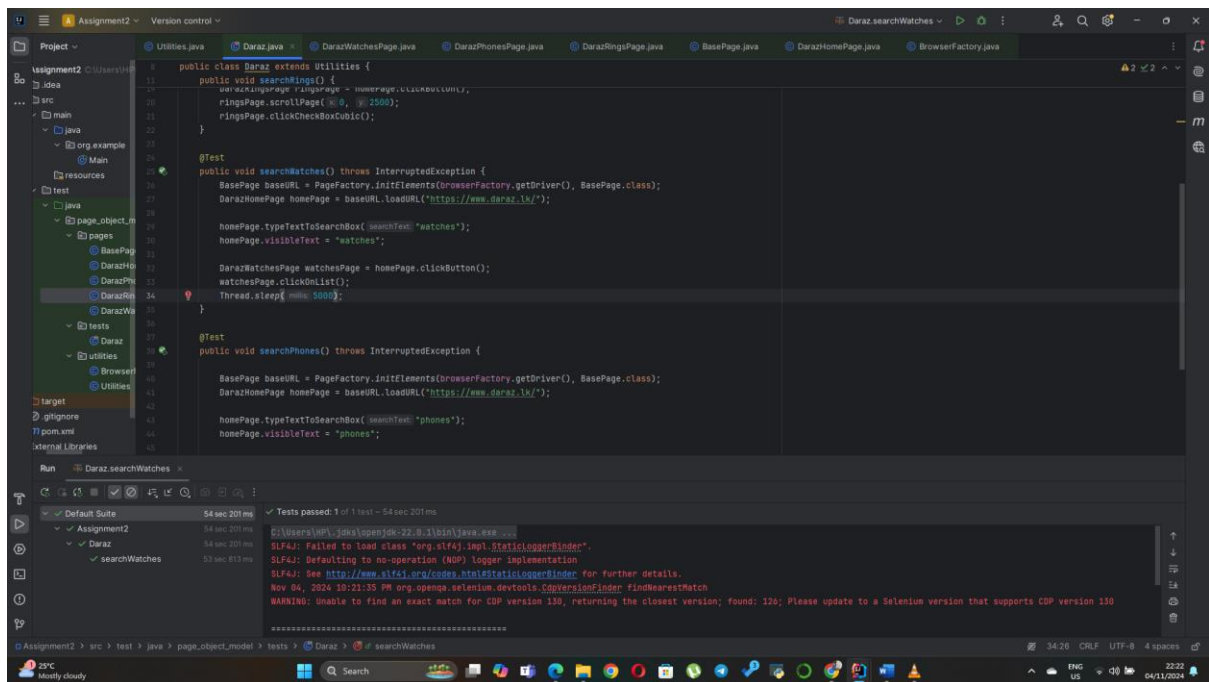


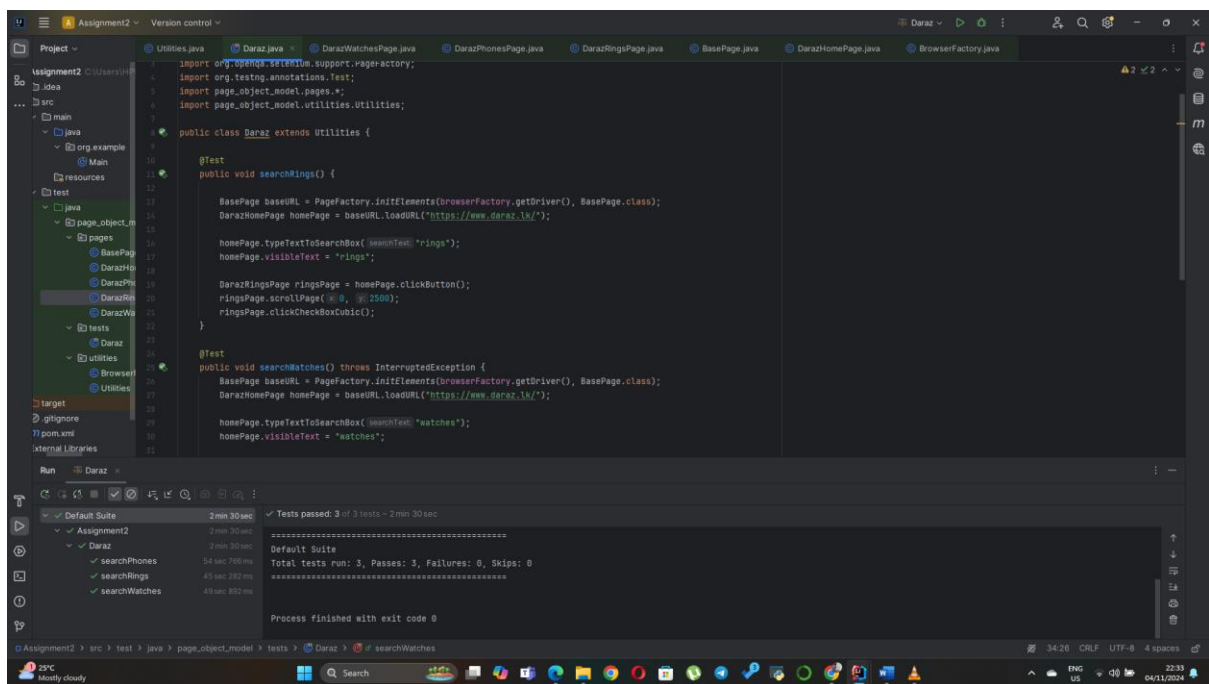
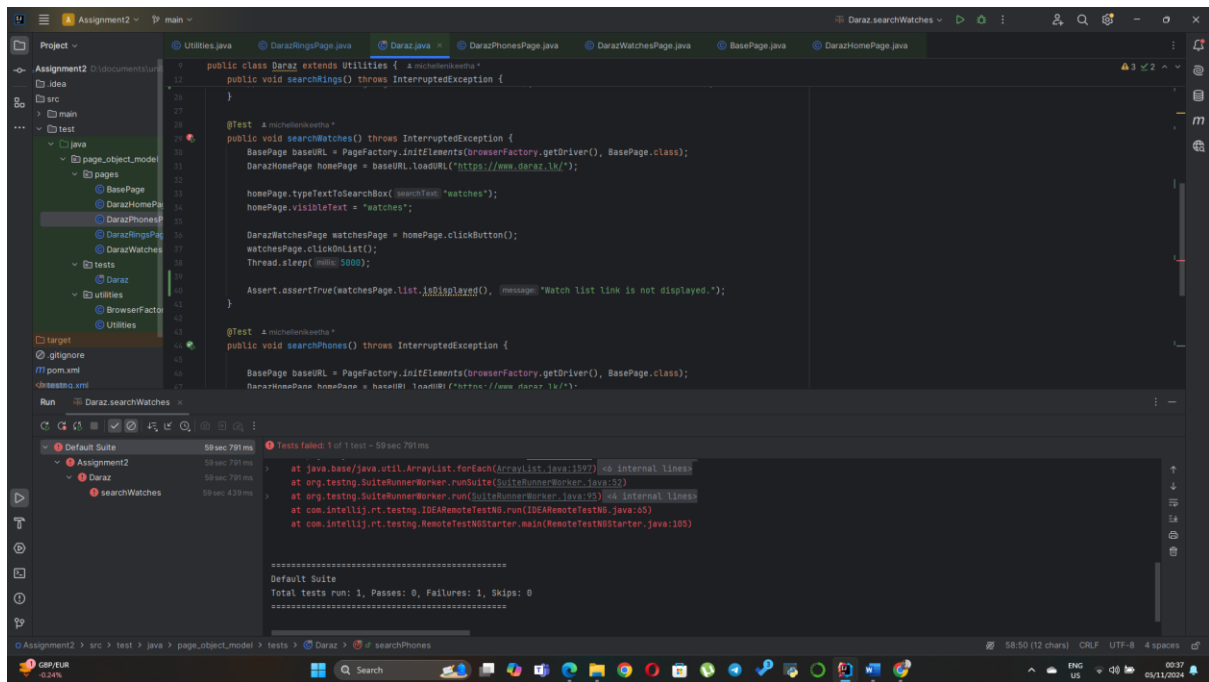
searchPhones



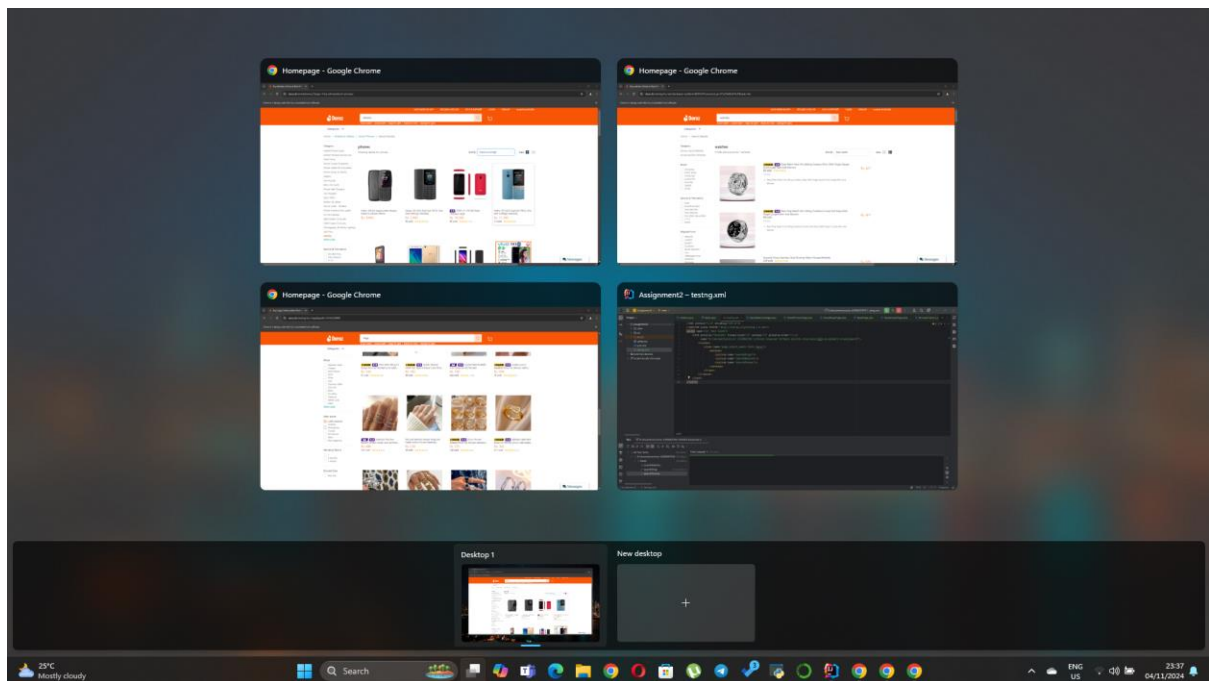
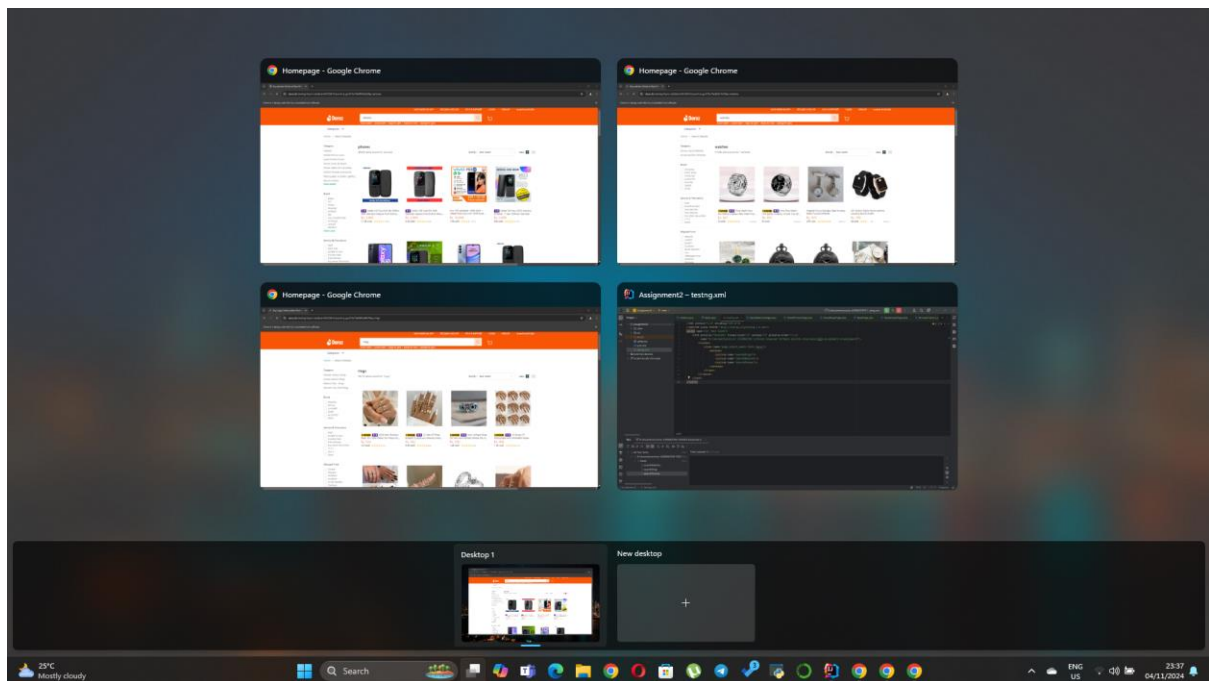


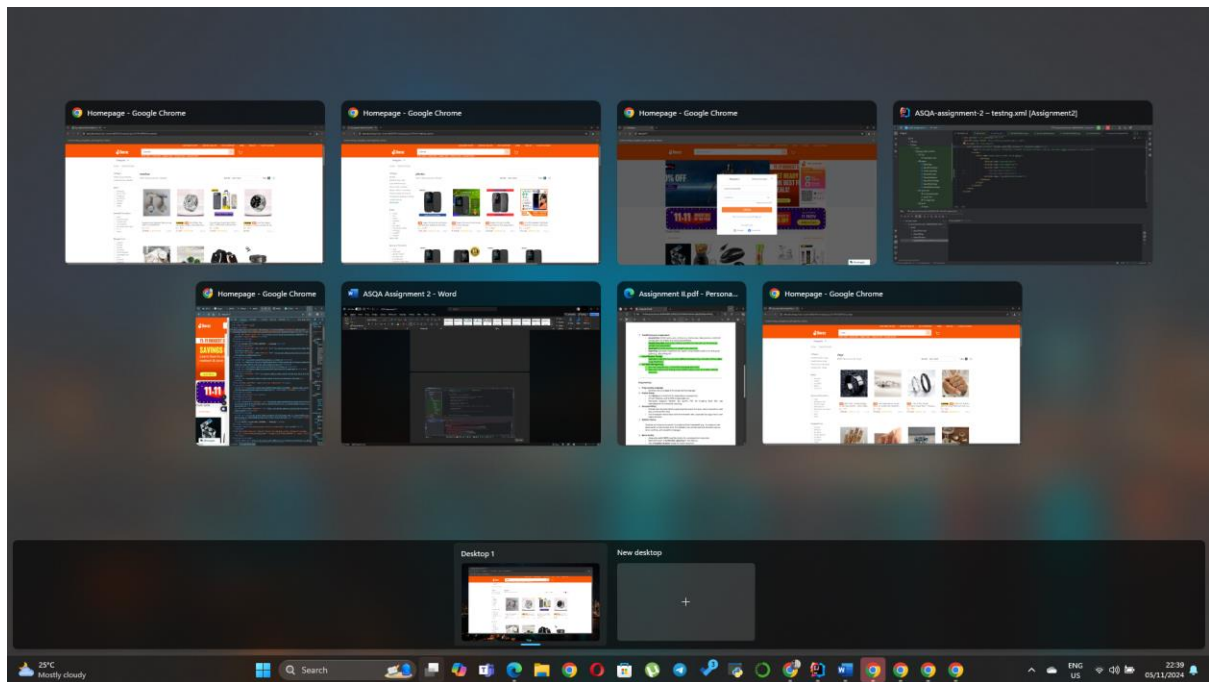
SearchWatches



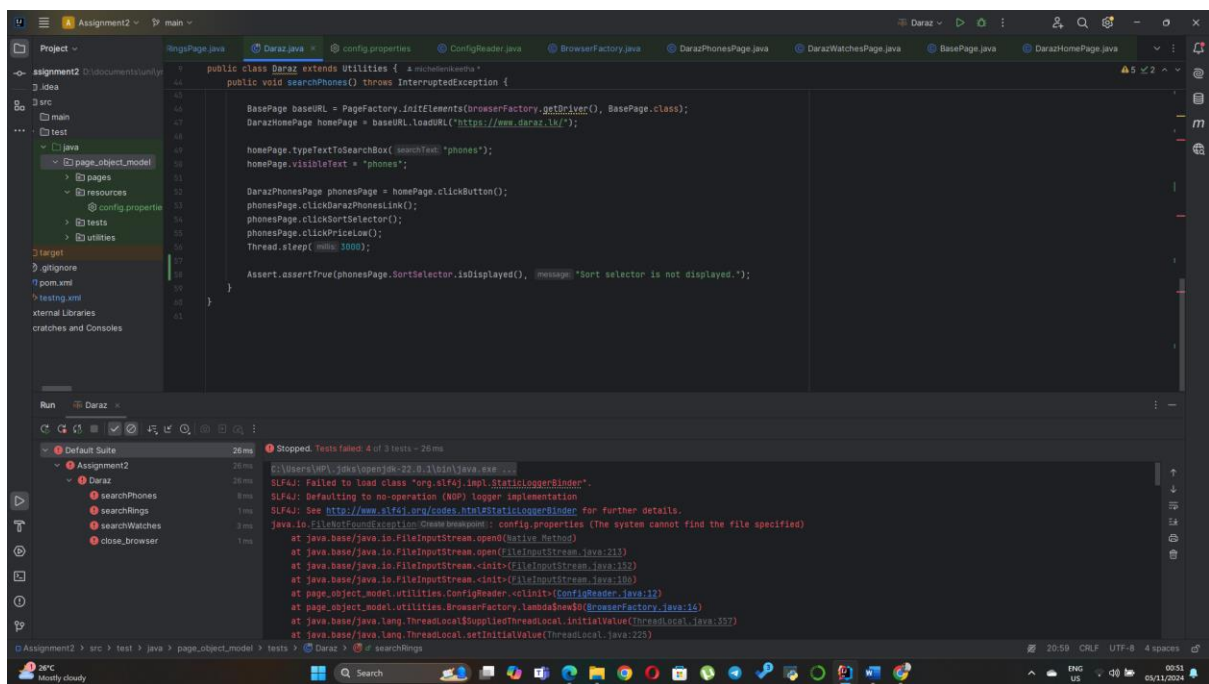


Parallel execution



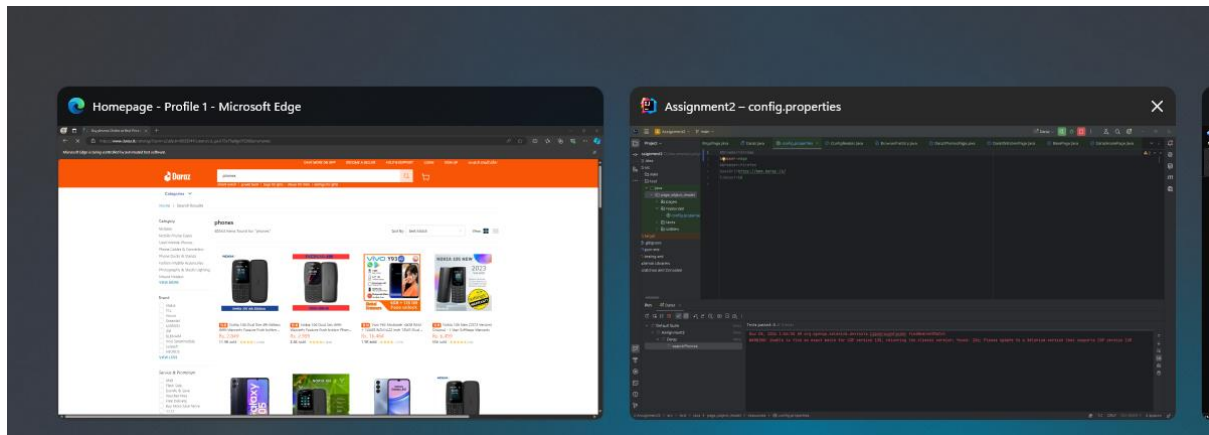


ConfigReader

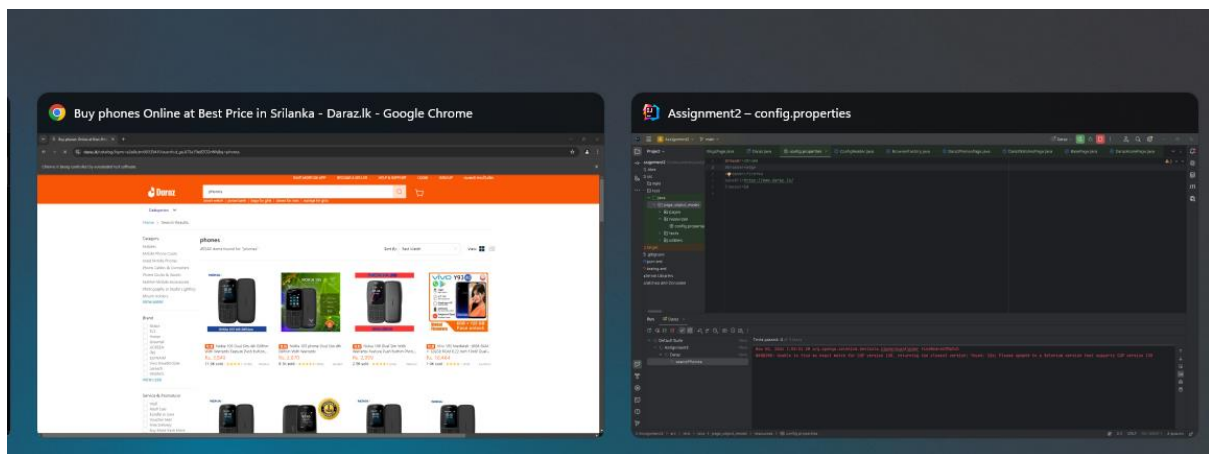


Cross-browser testing

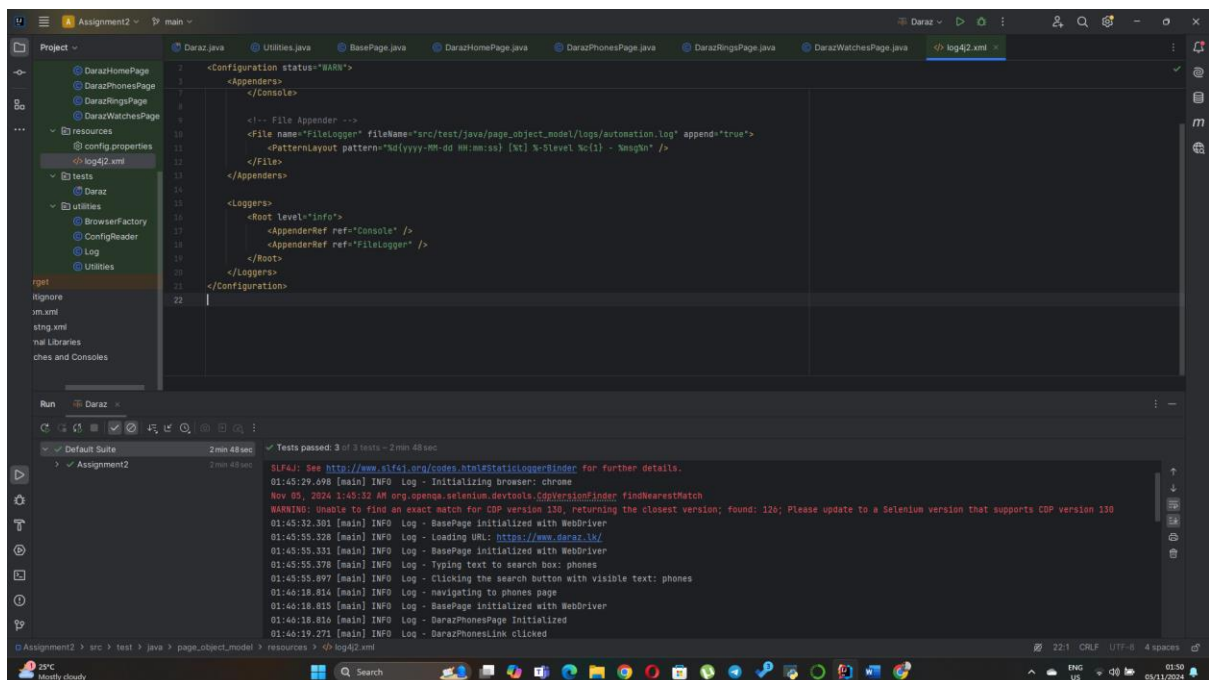
Edge



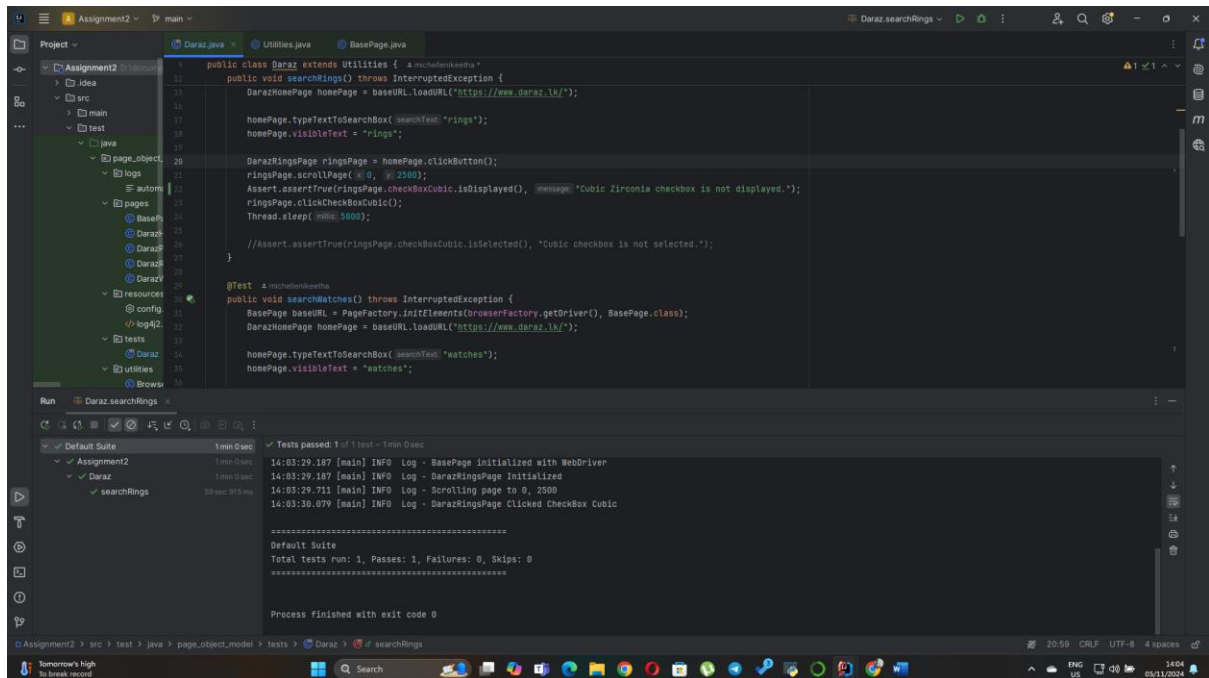
Chrome



Logging



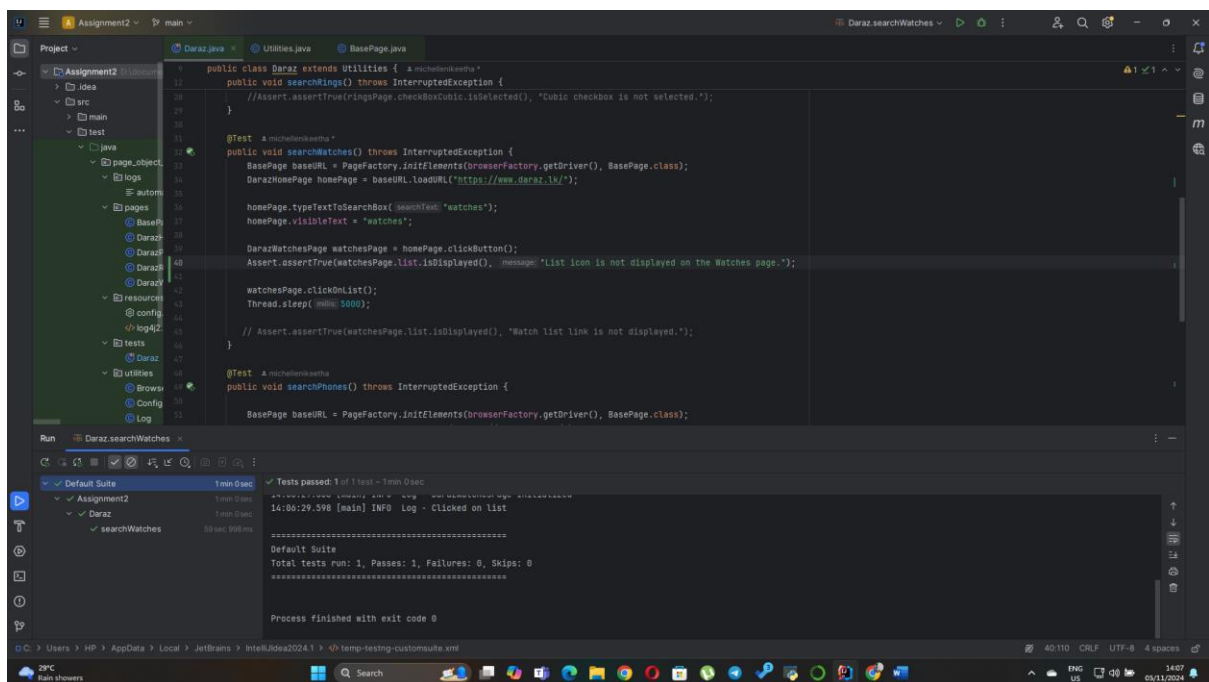
Assertions



```
public class Daraz extends Utilities {  
    @BeforeEach  
    public void searchRings() throws InterruptedException {  
        DarazHomePage homePage = baseUrl.loadURL("https://www.daraz.lk/");  
        homePage.typeTextToSearchBox(searchText: "rings");  
        homePage.clickButton();  
        DarazRingsPage ringsPage = homePage.clickButton();  
        ringsPage.scrollToPage(0, 0, 2500);  
        Assert.assertTrue(ringsPage.checkBoxCubic.isDisplayed(), message: "Cubic Zirconia checkbox is not displayed.");  
        ringsPage.clickCheckBoxCubic();  
        Thread.sleep(5000);  
        //Assert.assertTrue(ringsPage.checkBoxCubic.isSelected(), "Cubic checkbox is not selected.");  
    }  
}  
  
@Test  
@AfterClass  
public void searchMatches() throws InterruptedException {  
    BasePage baseUrl = PageFactory.initElements(browserFactory.getDriver(), BasePage.class);  
    DarazHomePage homePage = baseUrl.loadURL("https://www.daraz.lk/");  
    homePage.typeTextToSearchBox(searchText: "matches");  
    homePage.clickButton();  
    DarazMatchesPage matchesPage = homePage.clickButton();  
    Assert.assertTrue(matchesPage.list.isDisplayed(), message: "List icon is not displayed on the Matches page.");  
    matchesPage.clickOnList();  
    Thread.sleep(5000);  
    // Assert.assertTrue(matchesPage.list.isDisplayed(), "Match list link is not displayed.");  
}  
  
@Test  
@AfterClass  
public void searchPhones() throws InterruptedException {  
    BasePage baseUrl = PageFactory.initElements(browserFactory.getDriver(), BasePage.class);  
    DarazHomePage homePage = baseUrl.loadURL("https://www.daraz.lk/");  
    homePage.typeTextToSearchBox(searchText: "phones");  
    homePage.clickButton();  
    DarazPhonesPage phonesPage = homePage.clickButton();  
    Assert.assertTrue(phonesPage.list.isDisplayed(), message: "List icon is not displayed on the Phones page.");  
    phonesPage.clickOnList();  
    Thread.sleep(5000);  
    // Assert.assertTrue(phonesPage.list.isDisplayed(), "Phone list link is not displayed.");  
}  
}
```

Run Daraz.searchRings

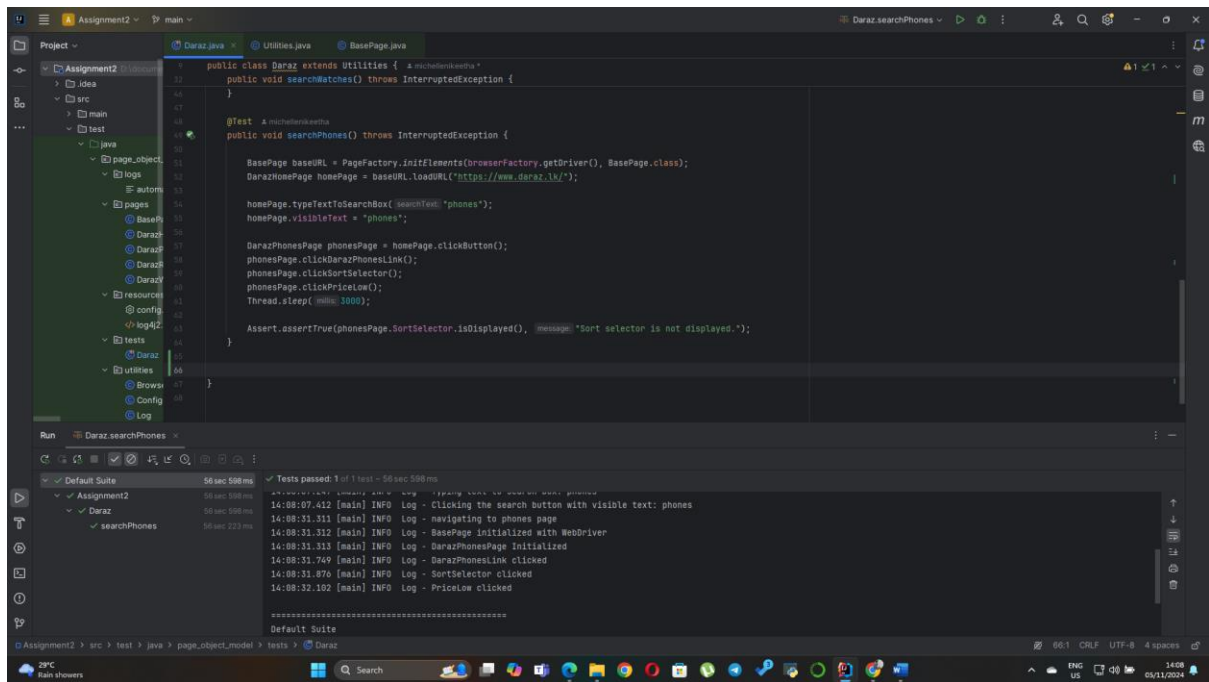
Default Suite 1min 0sec
✓ Tests passed: 1 of 1 test - 1min 0sec
14:03:29.187 [main] INFO Log - BasePage initialized with WebDriver
14:03:29.187 [main] INFO Log - DarazRingsPage initialized
14:03:29.711 [main] INFO Log - Scrolling page to 0, 2500
14:03:30.079 [main] INFO Log - DarazRingsPage Clicked CheckBox Cubic
Total tests run: 1, Passes: 1, Failures: 0, Skips: 0
Process finished with exit code 0



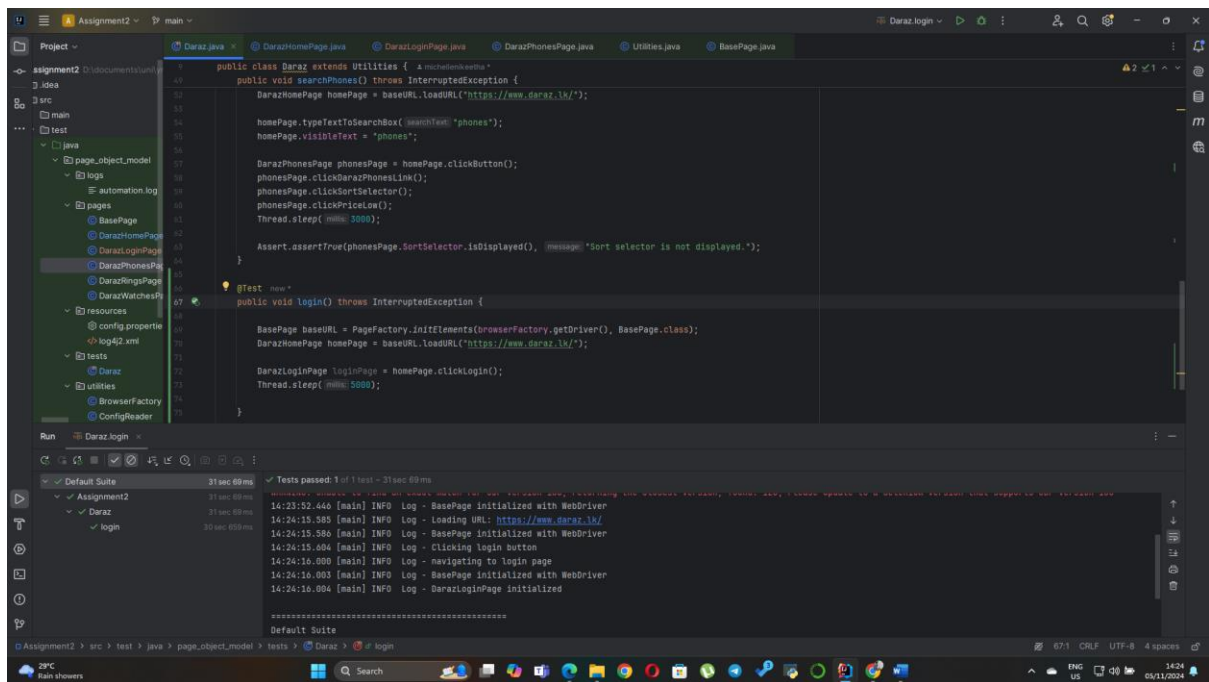
```
public class Daraz extends Utilities {  
    @BeforeEach  
    public void searchMatches() throws InterruptedException {  
        DarazHomePage homePage = baseUrl.loadURL("https://www.daraz.lk/");  
        homePage.typeTextToSearchBox(searchText: "matches");  
        homePage.clickButton();  
        DarazMatchesPage matchesPage = homePage.clickButton();  
        Assert.assertTrue(matchesPage.list.isDisplayed(), message: "List icon is not displayed on the Matches page.");  
        matchesPage.clickOnList();  
        Thread.sleep(5000);  
        // Assert.assertTrue(matchesPage.list.isDisplayed(), "Match list link is not displayed.");  
    }  
}  
  
@Test  
@AfterClass  
public void searchPhones() throws InterruptedException {  
    BasePage baseUrl = PageFactory.initElements(browserFactory.getDriver(), BasePage.class);  
    DarazHomePage homePage = baseUrl.loadURL("https://www.daraz.lk/");  
    homePage.typeTextToSearchBox(searchText: "phones");  
    homePage.clickButton();  
    DarazPhonesPage phonesPage = homePage.clickButton();  
    Assert.assertTrue(phonesPage.list.isDisplayed(), message: "List icon is not displayed on the Phones page.");  
    phonesPage.clickOnList();  
    Thread.sleep(5000);  
    // Assert.assertTrue(phonesPage.list.isDisplayed(), "Phone list link is not displayed.");  
}  
}
```

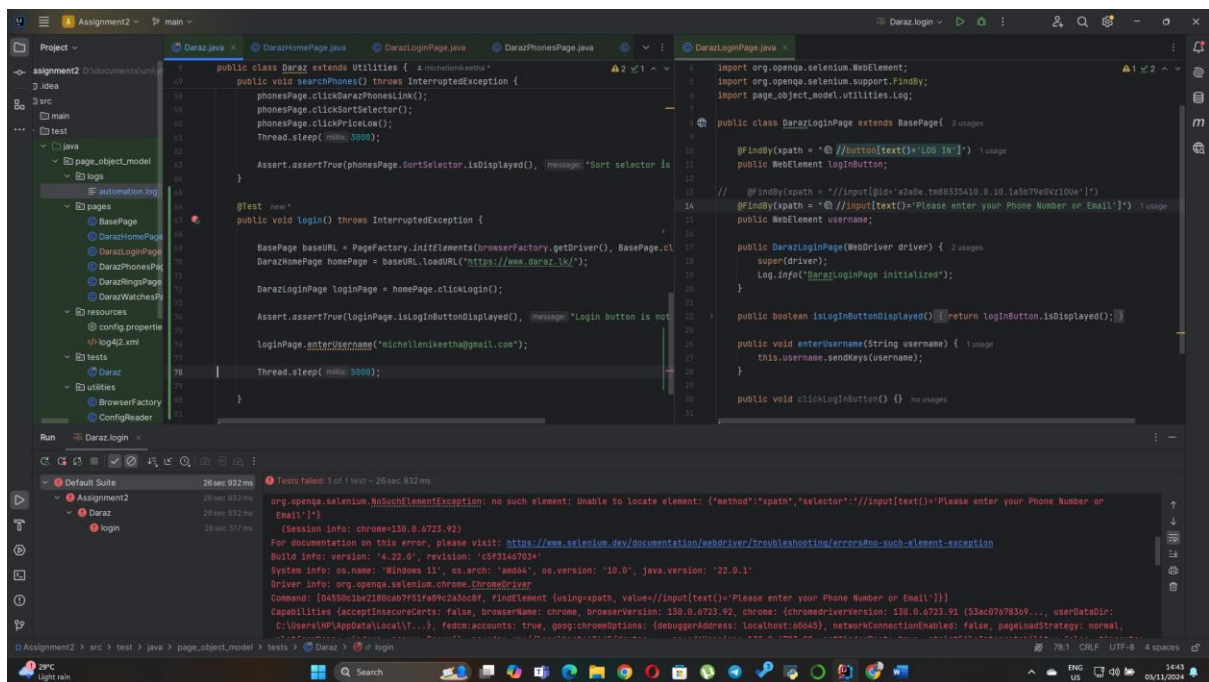
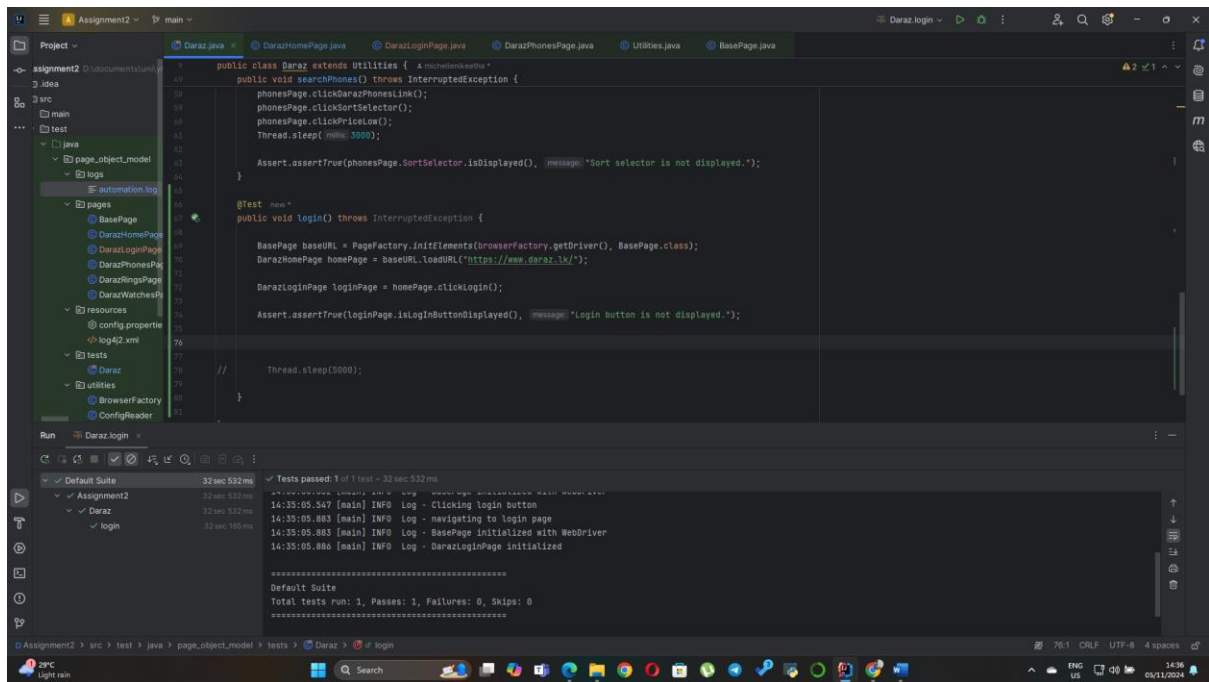
Run Daraz.searchMatches

Default Suite 1min 0sec
✓ Tests passed: 1 of 1 test - 1min 0sec
14:00:29.598 [main] INFO Log - Clicked on list
Total tests run: 1, Passes: 1, Failures: 0, Skips: 0
Process finished with exit code 0



Login Page





```

1  package page.object_model.pages;
2
3  import org.openqa.selenium.WebDriver;
4  import org.openqa.selenium.WebElement;
5  import org.openqa.selenium.support.FindBy;
6  import page.object_model.utilities.Log;
7
8  public class DarazLoginPage extends BasePage {
9
10     @FindBy(xpath = "//button[text()='LOG IN']") WebElement loginButton;
11
12     //FindBy(xpath = "//input[data-spn-anchor-id='a2abe.tb0335416.0.16.1a5b79e0vz10ue']")
13     //FindBy(xpath = "//input[text()='Please enter your Phone Number or Email']")
14     @FindBy(xpath = "//input[@type='text']") WebElement username;
15
16     public DarazLoginPage(WebDriver driver) {
17         super(driver);
18         Log.info("DarazLoginPage initialized");
19
20         public boolean isLoginButtonDisplayed() {
21             return loginButton.isDisplayed();
22         }
23     }
24 }

```

18 | Page

The screenshot shows the IntelliJ IDEA interface with a project named 'Assignment2'. The 'DarazLoginPage.java' file is open, showing a Selenium test class that extends 'Utilities'. The test method 'login()' performs the following steps:

- Initializes 'BasePage' with 'PageFactory' and 'WebDriver'.
- Loads the 'DarazHomePage' from the URL 'https://www.daraz.lk/'.
- Clicks the 'login()' button on the home page.
- Waits for 500ms.
- Asserts that the 'loginButton' is displayed.
- Enters the username 'michellinekeetha@gmail.com'.
- Enters the password '123456789'.
- Waits for 500ms.

The 'Run' window shows the test results for 'Daraz login':

```

Run Daraz login
40 sec 745 ms
✓ Tests passed: 1 of 1 test - 40 sec 745 ms
14:57:34.837 [main] INFO Log - enterPassword: 123456789
Default Suite
Total tests run: 1, Passes: 1, Failures: 0, Skips: 0
Process finished with exit code 0

```

The screenshot shows the IntelliJ IDEA interface with the 'DarazMyProfile.java' file open. The test class extends 'BasePage' and contains several methods to interact with the 'myProfile' page. The test method 'myProfile()' performs the following steps:

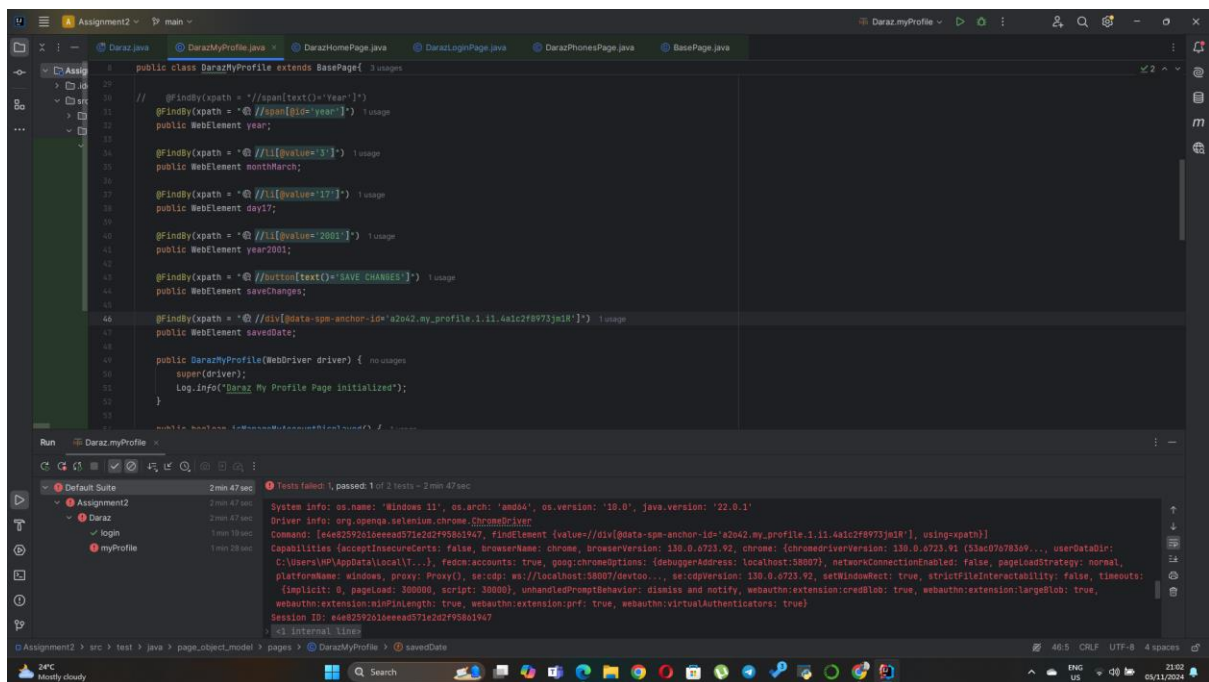
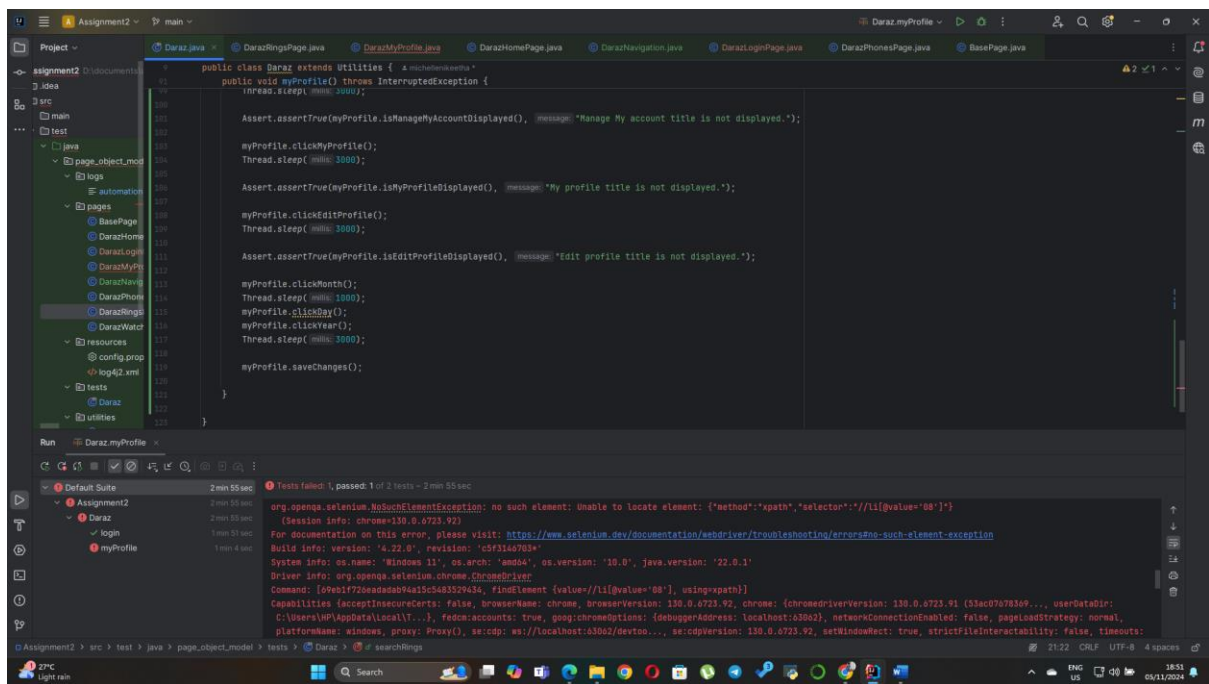
- Clicks the 'Manage My Account' button.
- Clicks the 'My Profile' button.
- Clicks the 'EDIT PROFILE' button.
- Clicks the 'Edit Profile' button.
- Clicks the 'Month' button.
- Clicks the 'Day' button.
- Clicks the 'Year' button.
- Clicks the 'monthMay' button.

The 'Run' window shows the test results for 'Daraz myProfile':

```

Run Daraz myProfile
2 min 25 sec
✗ Tests failed: 1, passed: 1 of 2 tests - 2 min 25 sec
org.openqa.selenium.NoSuchElementException: no such element: Unable to locate element: {"method":"xpath","selector":"//span[text()='Month']"}
(Session info: chrome=130.0.6723.92)
For documentation on this error, please visit: https://www.selenium.dev/documentation/webdriver/troubleshooting/errors/no-such-element-exception
Build info: version: '4.22.0', revision: 'c5f3146703'
System info: os.name: 'Windows 11', os.arch: 'amd64', os.version: '10.0', java.version: '22.0.1'
Driver info: org.openqa.selenium.chrome.ChromeDriver
Command: [843a8080ba083hdc9db7990837, findElement(value="//span[text()='Month']", using=xpath)]
Capabilities {acceptInsecureCerts: false, browserName: chrome, browserVersion: 130.0.6723.92, chrome: {chromedriverVersion: 130.0.6723.91 (53ec07678369..., userDataDir: C:\Users\HP\AppData\Local\T...), fedcm:accounts: true, goog:chromeOptions: {debuggerAddress: localhost:59813}, networkConnectionEnabled: false, pageLoadStrategy: normal, platformName: windows, proxy: Proxy(), se:cdp: ws://localhost:59813/devtoo..., se:cdpVersion: 130.0.6723.92, setWindowRect: true, strictFileInteractability: false, timeouts:

```

Data Provider

