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SE2226 - Software Quality Assurance and Testing Term Project Report

Project Name	Amazon Website Testing
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Course Section No	1

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Introduction:

Amazon is a website (https://www.amazon.com.tr) which is used for online shopping world-wide. It is found in 1994 and it is one of the biggest sites of the world. On the website, there are nearly 300 million members and more than 353 million products in multiple categories such as fashion, consumer electronics, home & furniture, grocery and lifestyle products.

In our project, We tested Amazon website in these categories:

- 1. Black-Box Testing
 - 1.1 Testing Report
 - 1.2 Decision Table
 - 1.3 Equivalence Table
 - 1.4 Boundary Analysis
 - 1.5 Use Case Testing
- 2. White-Box Technique
 - 2.1 Test for Java Selenium, ChromeDriver
- 3. Usability Testing
- 4. Performance Testing
 - 4.1 Load Testing

Testing:

1. Black-Box Testing:

1.1 Testing Report for Sign up Action:

-Checkbox is necessary

Name Surname	E-Mail Input	Password Input	2.Password	Checkbox	Output	Comment	Program error?
Testing Project	testing.se2226project@gmail.com	232014PMH	232014PMH	checked	Main Menu has opened	User signed up successfully	No
null	testing.se2226project@gmail.com	232014PMH	232014PMH	checked	Please enter your name and surname	Couldn't sign up	No
Testing Project	null	232014PMH	232014PMH	checked	Please enter e-mail	Couldn't sign up	No
Testing Project	testing.se2226project@gmail.com	null	null	Checked	Please enter password	Couldn't sign up	No
Testing Project	testing.se2226project@gmail.com	2320	2320	Checked	Password must be at least 6 characters	Couldn't sign up	No
Testing Project	testing.se2226project@gmail.com	232014PMH	2320	Checked	Passwords doesn't match	Couldn't sign up	No
Testing Project	testing.se2226project@gmail.com	232014PMH	232014PMH	Unchecked	Please check the box	Couldn't sign up	No
Testing Project	testingSe2226project@gmail.com	232014PMH	232014PMH	Checked	The email address is already taken	Couldn't sign up	No
Null	null	null	null	Unchecked	Please enter your name, please enter your email, Minimum 6 characters	All fields are empty	No

1.2 Decision Table for Log in Action:

Explanation: In this decision table we have two conditions which are: Email and Password. Therefore, we have 2^2 = 4 different rules. T symbolizes true, F symbolizes false. The tick symbol shows us the action as known as output.

	R1	R2	R3	R4
CONDITIONS				
EMAIL	T	Т	F	F
PASSWORD	Т	F	Т	F
ACTIONS				
HOME PAGE	✓			
SHOW ERROR		✓	✓	✓
MESSAGE				

1.3 Equivalence Table:

We decided to use equivalence partitioning on price filtering of Amazon's Dizüstü Bilgisayar Category. Our goal is to find valid prices according to price boundaries, to make our item search easier. Price is computer's price that placed in the given range. User click the range that he/she want to choose, and system displays the items.

Equiv	valence Class	Test Input	Expected Output
E1	5000<= price<= 7000	5399	1 Computer founded
E2	7000 <price<=10000< th=""><th>8999</th><th>1 Computer founded</th></price<=10000<>	8999	1 Computer founded
E3	10000 <price<=15000< th=""><th>11999</th><th>9 Computer founded</th></price<=15000<>	11999	9 Computer founded
E4	15000 <price<=40000< th=""><th>20999</th><th>20 Computer founded</th></price<=40000<>	20999	20 Computer founded
E5	40000 <price< th=""><th>46000</th><th>4 Computer founded</th></price<>	46000	4 Computer founded
U1	price<0	-3	Error message
U2	Not a valid price	"b"	Error message

Price filter category screen shot	Fiyat
	☐ 5000 – 7000 TL
	7000 – 10000 TL
	☐ 10000 – 15000 TL
	☐ 15000 – 40000 TL
	🗌 40000 TL ve Üzeri
	TLMin TLMaks. Git

1.4 Boundary Analysis:

In this boundary analysis we have tested every boundary that takes place in our equivalence table. With boundary test inputs and the expected outputs of these inputs.

Equiv	valence Class	Test Input	Expected Output
E1	5000<= price<= 7000	4999	Couldn't Found
		5000	Couldn't Found
		5001	Couldn't Found
		6999	1 Computer founded
		7000	1 Computer founded
E2	7000 <price<=10000< th=""><th>7001</th><th>1 Computer founded</th></price<=10000<>	7001	1 Computer founded
		9999	1 Computer founded
		10000	1 Computer founded
E3	10000 <price<=15000< td=""><td>10001</td><td>5 Computer founded</td></price<=15000<>	10001	5 Computer founded
		14999	7 Computer founded
		15000	9 Computer founded
E4	15000 <price<=40000< td=""><td>15001</td><td>16 Computer founded</td></price<=40000<>	15001	16 Computer founded
		39999	18 Computer founded
		40000	8 Computer founded
E5	40000 <price< td=""><td>40001</td><td>4 Computer founded</td></price<>	40001	4 Computer founded
U1	price<0	-3	Error message
U2	Not a valid price	"b"	Error message

1.5 Use Case Testing:

Use Case Form

Use Case Name: Select and add item to the cart and delete it

Actor: Customer

Trigger: Customer wants to purchase items

Precondition: Customer must have an existing account

Normal Flow of Events:

- 1. Customer enters to the Amazon's sites login page.
- 2. Customer enters his/her e-mail.
- 3. Customer clicks to the "Devam et" button.
- 4. Customer enters his/her password.
- 5. Customer clicks on "Giriş Yap" button.
- 6. System verifies the e-mail and password and directs the customer to the home page.
- 7. Customer clicks on "Tümü" category.
- 8. Customer clicks on the displayed "Bilgisayar" button.
- 9. System directs the customer to the Bilgisayar page.
- 10. Customer chooses "Dizüstü Bilgisayarlar" button.
- 11. Customer chooses "Windows 11 Home" filter.
- 12. Customer sets a filter for price fields between 10000-32000.
- 13. Customer changes the filter to "Düşükten Yükseğe".
- 14. System displays all the items ordered by ascending order.
- 15. Customer goes to second page.

- 16. Customer selects an item that he/she wants to purchase.
- 17. Customer goes over every photo of the product.
- 18. Customer clicks the "Sepete Ekle" button to add an item to his/her cart.
- 19. System displays a screen to the customer which has "Şimdi Al" and "Sepete Ekle" options.
- 20. Customer clicks on the option "Sepete Ekle".
- 21. Customer clicks on "Sepete Git" button.
- 22. System displays the purchase page.
- 23. Customer clicks on the "Sil" button.
- 24. System displays a confirmation message.

Alternate Flows:

- 6A1: Customer enters incorrect e-mail to login.
 - 1. System displays an error message about wrong password or e-mail.
 - 2. Customer enters the correct e-mail.
 - 3. Use case continues.
- 6A2: Customer enters incorrect password to login.
 - 1. System displays an error message about wrong password or e-mail.
 - 2. Customer enters the correct password.
 - 3. Use case continues.
- 7A1: Customer clicks on the "Moda" category button.
 - 1. System displays the "Moda" category page.
 - 2. Use case continues.
- 12A1: Customer sets a filter for price fields between 100-1000.
 - 1. System filters the prices for 100-1000.
 - 2. System displays the page that informs the customer there are no product according to their filters.
 - 3. Customer clicks on home page button.
 - 4. Use case ends.
- 12A2: Customer sets a filter for Sabit Sürücü Kapasitesi between 200-499 GB.
 - 1. System filters by the Sabit Sürücü Kapasitesi and displays the items.
 - 2. Use case continues.
- 20A1: Customer clicks on the option "Şimdi Al".
 - 1. Customer enter his/her billing information.
 - 2. System confirms the payment.
 - 3. Purchase has been made.
 - 4. Use case ends.

Test Cases:

	Scenario	Email	Password	Category	Filter	Item	Add to	Go to	Delete	Go	Expected output
							cart	cart	item	homepage	
1	Normal	V	V	Selects	Filters	Selects	V	٧	٧	N/A	Customer successfully
	Flow/Customer			category	item	item					selects and deletes
	selects an item and										the item from the cart
	delete from the										
	cart										
2	Customer enters	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	System shows error
	incorrect email										message that says
											email is wrong
3	Customer enters	V	Invalid 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	System shows error
	incorrect password		time, then								message that says
			valid								wrong password
4	Customer clicks on	V	V	Selects	N/A	N/A	N/A	N/A	N/A	N/A	Customer chooses
	different category			different							different category to
				category							shop
5	Customer filters	V	V	Selects	Different	Selects	N/A	N/A	N/A	N/A	System shows that
	the price			category	filter	item					there are no products
											Customer can't add
											item to the cart
											returns to homepage
6	Customer selects	V	V	Selects	Different	Selects	N/A	N/A	N/A	N/A	System displays items
	different filter			category	filter	item					according to the
	option										selected filter
7	Customer chooses	V	V	Selects	filters	Selects	V	1	1	N/A	Customer buys the
	to buy directly			category		item					item directly

TC1, TC3, and TC5 are automated by Selenium Web driver.

Generated test cases:

Test	Email	Password	Category	Filter	Item	Add to	Go to	Delete	Go	Expected output
Cases						cart	cart	item	homepage	
TC1	testing.se2226project@gmail.com	232014PMH	Bilgisayarlar	Price filter (10000,32000), Operating system filter(Windows 11 home) Sorting filter (düşükten,yükseğe)	Casper Nirvana C500.1115- 8V00T-G-F Intel Core i3	selected	selected	selected	N/A	Customer successfully selects and deletes the item from the cart
TC2	se2226project@gmail.com	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	System shows error message that says email is wrong
TC3	testing.se2226project@gmail.com	Wrongpassword , 232014PMH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	System shows error message that says wrong password
TC4	testing.se2226project@gmail.com	232014PMH	Moda	N/A	N/A	N/A	N/A	N/A	N/A	Customer choose different category to shop
TC5	testing.se2226project@gmail.com	232014PMH	Bilgisayarlar	Price filter (100,1000), Operating system filter(Windows 11 home) Sorting filter (düşükten,yükseğe)	No item	N/A	N/A	N/A	N/A	System shows that there are no products Customer can't add item to the cart returns to homepage
TC6	testing.se2226project@gmail.com	232014PMH	Bilgisayarlar	Hard drive capacity filter(200-499GB)	N/A	N/A	N/A	N/A	N/A	System displays items according to the selected filter
TC7	testing.se2226project@gmail.com	232014PMH	Bilgisayarlar	Price filter (10000,32000), Operating system filter(Windows 11 home) And Sorting filter (düşükten,yükseğe)	Asus Zenbook 14 OLED (UX3402)	selected	Not selected	Not selected	N/A	Customer buys the item directly

2. White-Box Technique

2.1 Test for Java Selenium, ChromeDriver

We have used the Selenium library and ChromeDriver while automating out test cases. Scenarios that we have tested are given above the use case table TC1, TC3 and TC5. TC1 is the normal flow where customer logs in to the system successfully and after the necessary selections and filters, customer selects the computer, adds to the cart and then deletes from the cart. TC3 is an alternative flow where customer enters the incorrect password in the first try then in the second try enters it correctly then continues as the normal flow. TC5 is an alternative flow when customer selects different filtering options (price filter between 100 and 1000) and web application could not display any items according to the filters. We have started our automation in the login page of Amazon and we have continued according to the steps on the use case form. Here is the code of the normal flow, the rest of the code is in JavaSeleniumCode file.

```
public void normalFlom() throws InterruptedException {
    System.setProperty("modedIver, ...home.driver", "C:/Users//Hert/Selenium/ChromeGriver/chromedriver.exe");
    WebDitine driver-med forthers. (home.driver., "C:/Users//Hert/Selenium/ChromeGriver/chromedriver.exe");
    driver.get("https://www.amazon.com.tr/ap/signin?openid.pape.max.auth.age=BGopenid.return.to=https:SAX2FX2Favew.amazon.com.tr/ap/signin?openid.pape.max.auth.age=BGopenid.return.to=https:SAX2FX2Favew.amazon.com.tr/ap/signin?openid.pape.max.auth.age=BGopenid.return.to=https:SAX2FX2Favew.amazon.com.tr/ap/signin?openid.pape.max.auth.age=BGopenid.return.to=https:SAX2FX2Favew.amazon.com.tr/ap/signin?openid.pape.max.auth.age=BGopenid.return.to=https:SAX2FX2Favew.amazon.com.tr/ap/signin?openid.pape.max.auth.age=BGopenid.return.to=https://dip/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/signin/
```

```
Thread.sleep( millis: 2000);
Thread.sleep( millis: 2000);
WebElement qit = driver.findElement(By.xpath( xpathExpression: "//input[@class='a-button-input']"));
Thread.sleep( millis: 2000);
WebElement order = driver.findElement(By.xpath(xpathExpression: "//span[@class='a-dropdown-prompt']"));
order.click();
Thread.sleep( millis: 2000);
selectorder.click();
Thread.sleep( millis: 2000);
WebElement select_comp = driver.findElement(By.xpath(xpathExpression: " //span[@class='a-size-base-plus a-color-base a-text-normal']"));
select_comp.click();
Actions action = new Actions(driver);
List<WebElement> photoitems = driver.findElements(By.xpath(xpathExpression: "//*[@id=\"altImages\"]/vl//li"));
cart.click();
String ExpectedTitle="Sepete Eklendi";
String ActualTitle=driver.findElement(By.xpath( xpathExpression: "//*[@id='NATC_SMART_WAGON_CONF_MSG_SUCCESS']/span")).getText();
```

```
Assert.assertEquals(ExpectedTitle, ActualTitle);

System.out.println("title:" + ActualTitle);

Thread.sleep( millis 2000);

WebElement goToCart = driver.findElement(By.xpath( xpathExpression: "//*[@id='sw-gtc']/span/a"));

goToCart.click();

Thread.sleep( millis 2000);

WebElement delete = driver.findElement(By.xpath( xpathExpression: "//input[@value='Sit']"));

delete.click();

String ExpectedTitle2="Alisveris Sepeti";

String ActualTitle2=driver.findElement(By.xpath( xpathExpression: "//*[@id='sc-active-cart']/div/div/div/hl")).getText();

Assert.assertEquals(ExpectedTitle2, ActualTitle2);

System.out.println("title:" + ActualTitle2);
```

(NOTE: At the end of the normal flow we have written assertion code for delete action of the code but in the web application "Amazon sepetiniz boş." This text is shown but when we get the actual text it writes "Alışveriş sepeti" so the actual and expected text does not match so to be sure that we have deleted the item we write "Alışveriş sepeti" into the expected title too.)

```
[1684152549.782][WARNING]: This version of ChromeDriver has not been tested with Chrome version 113.

May 15, 2023 3:09:10 PM org.openqa.selenium.devtools.CdpVersionFinder findNearestMatch

WARNING: Unable to find an exact match for CDP version 113, so returning the closest version found: 112

title:Sepete Eklendi

Exception in thread "main" org.junit.ComparisonFailure Create breakpoint: expected:<A[mazon sepetiniz boş.]> but was:<A[lişveriş Sepeti]> <2 internal at tests.normalFlow(tests.java:104)
    at main.main(main.java:9)

Process finished with exit code 1
```

3. Usability Testing:

Website is tested for these browsers and seen that the website works correctly in these browsers:

- Google Chrome
- Mozilla Firefox
- Internet Explorer/Microsoft Edge

4. Performance Testing

Load Testing: We used Jmeter load test for Amazon Website. These screenshots are belong to 1000 number of samples.







Server Hostname: www.amazon.com.tr

Time taken for tests: 27.4 seconds

Completed request: 1000

Failed request: 345

Average bytes: 99221.7 bytes

Longest request: 15850

Shortest request: 113

amazon



Önemli Mesaj!

Hesabınızı daha iyi korumak için lütfen şifrenizi ve ardından aşağıdaki görselde bulunan karakterleri göründüğü şekilde girin.

estina se2226projec	ct@gmail.com Değiştir
	•
Şifre	Şifremi unuttun
Gördüğünüz ka	rakterleri girin
	· · · · ·
6	1 8 W/
	/ w
Yeni bir doğru	ılama görüntüsü deneyin
Doğrular	ma kodunu dinleyin
Karakterleri girin	
	iede sorun mu yaşıyorsunuz?
Resmi görüntülem	
Resmi görüntülem	

Additional note: if you see an screen like this enter the correct password once then run the code again this sometimes happens if the application stays open in someone's computer(password:232014PMH).