Spring, 2021-2022

SE2226 – Software Quality Assurance and Testing

Term Project Report

Project Name:	**Sneaks Up Website Testing**
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Department:	**Software Engineering**
Course Section Numbers:	**1 / 2**

1. Introduction:

Sneaks Up is a website (https://www.sneaksup.com/) that is used for online clothing shopping in Turkey. Its first physical store opened in December 2014 in İstanbul. However, its website is available since 2016. On the website, you can find many brands and many items. It has a vast variety of clothing items in multiple categories such as t-shirts, shoes, sweatshirts, pants, etc.

In our project, we tested Sneaks Up in these categories:

1. Functional Testing
2. Security Testing
3. Usability Testing
4. Coverage Analysis

2. Testing:

2.1 Functional Testing:

- Testing Report for Registration action: Checkbox 1 is necessary; Checkbox 2 is optional.

Scenarios	Name Input	Surname Input	Phone Number Input	Mail Input	Password Input	Gender Input	Birthday Input	Checkbox1	Checkbox 2	Expected Output	Program Error
Successfully Registered	Yarkın	Ataç	5395511185	yarkinatac2@gmail.com	2235258q	Male	08/06/2001	Checked	Not Checked	You are successfully registered.	No
Registration with already used e-mail	Yarkın	Ataç	5395511185	selimyaylali1@gmail.com	2235258q	Male	08/06/2001	Checked	Not Checked	The e-mail you entered is already registered to our system.	No
Registration with invalid e-mail input	Yarkın	Ataç	5395511185	asHdfakj.com	2235258q	Male	08/06/2001	Checked	Not Checked	The e-mail you entered is invalid.	No
Registration with invalid password- min 6 characters	Yarkın	Ataç	5395511185	yarkinatac2@gmail.com	1	Male	08/06/2001	Checked	Not Checked	Password should be at least 6 words.	No

- Decision table for e-mail input in registration process.

Conditions	R1	R2	R3	R4	R5	R6	R7	R8
At least 7 characters	T	T	T	T	F	F	F	F
Contains @****.com	T	T	F	F	T	T	F	F
Does not contain uppercase character	T	F	T	F	T	F	T	F
Action								
E-mail for new account	Valid	Not Valid	Not Valid	Not Valid	Not Valid	Not Valid	Not Valid	Not Valid

- Use Case Testing: TC1, TC2, TC3, TC4, TC5 is automated by Selenium IDE.

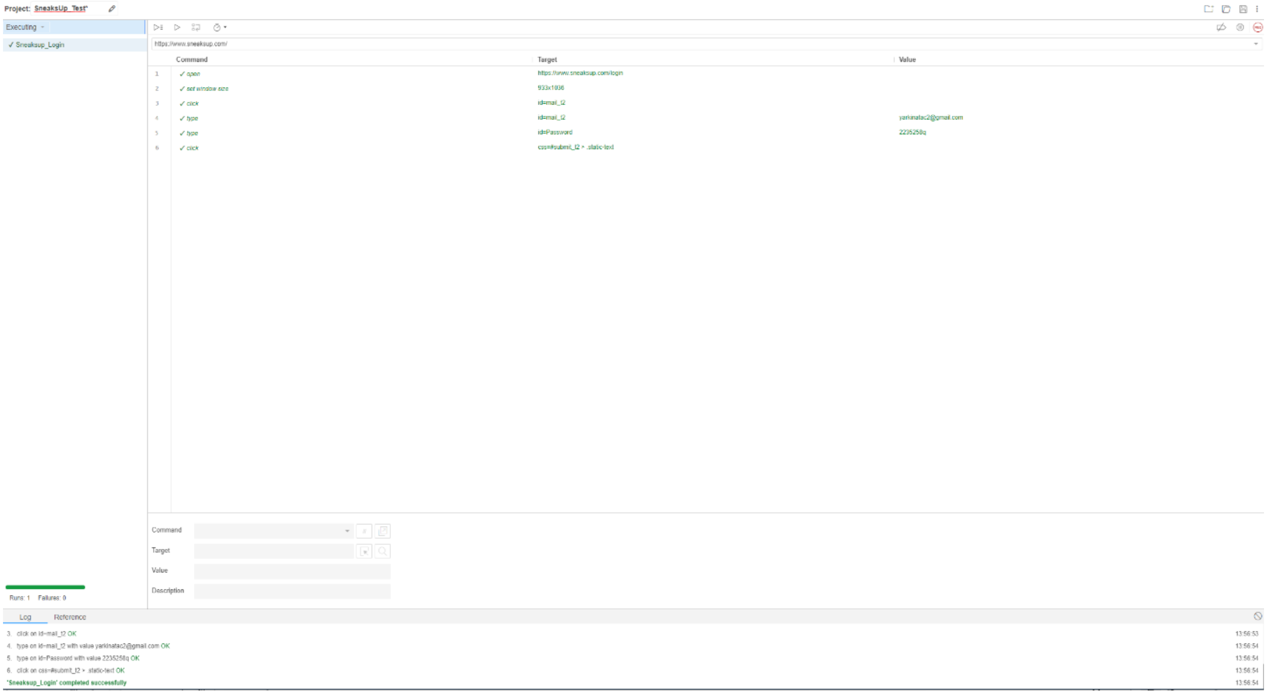
Scenarios	Email and Password	Search Item	Add to Shopping Cart	Address Info	Payment Info	Confirm	Expected Result
Successful Order	V	V	V	V	V	V	Order is completed.
Buy without registration	N/A	V	V	V	V	V	Order is completed.
Add maximum of 2 pairs of the same item to the cart	V	V	I	N/A	N/A	N/A	Customer is notified that maximum 2 pairs can be added.
Correct Login	V	N/A	N/A	N/A	N/A	N/A	Customer logged in. Home screen is displayed.
Incorrect password or email	I	N/A	N/A	N/A	N/A	N/A	Password validation error.
Incorrect payment	V	V	V	V	I	N/A	Payment error. Order is canceled

Test Case ID	Email and Password	Search Item	Add to Shopping Cart	Address Info	Payment Info	Confirm	Expected Result
TC1	yarkinatac2@gmail.com 2235258q	Nike Blazer Mid '77 Jumbo	Added 1 pair	Bornova, İzmir	1111-2222-3333-4444	Order is confirmed.	Order is completed.
TC2	N/A	Nike Blazer Mid '77 Jumbo	Added 1 pair	Bornova, İzmir	1111-2222-3333-4444	Order is confirmed.	Order is completed.
TC3	yarkinatac2@gmail.com 2235258q	Nike Blazer Mid '77 Jumbo	Added 3 pairs	N/A	N/A	N/A	Customer is notified that maximum 2 pairs can be added.
TC4	yarkinatac2@gmail.com 2235258q	N/A	N/A	N/A	N/A	N/A	Customer logged in. Home screen is displayed.
TC5	yarkinatac2@gmail.com 12334	N/A	N/A	N/A	N/A	N/A	Password validation error.
TC6	yarkinatac2@gmail.com 2235258q	Nike Blazer Mid '77 Jumbo	Added 1 pair	Bornova, İzmir	1111-1111-2222-0001	N/A	Payment error. Order is canceled

-Automated Testing (Selenium IDE)

Selenium IDE is used in all our automated tests.

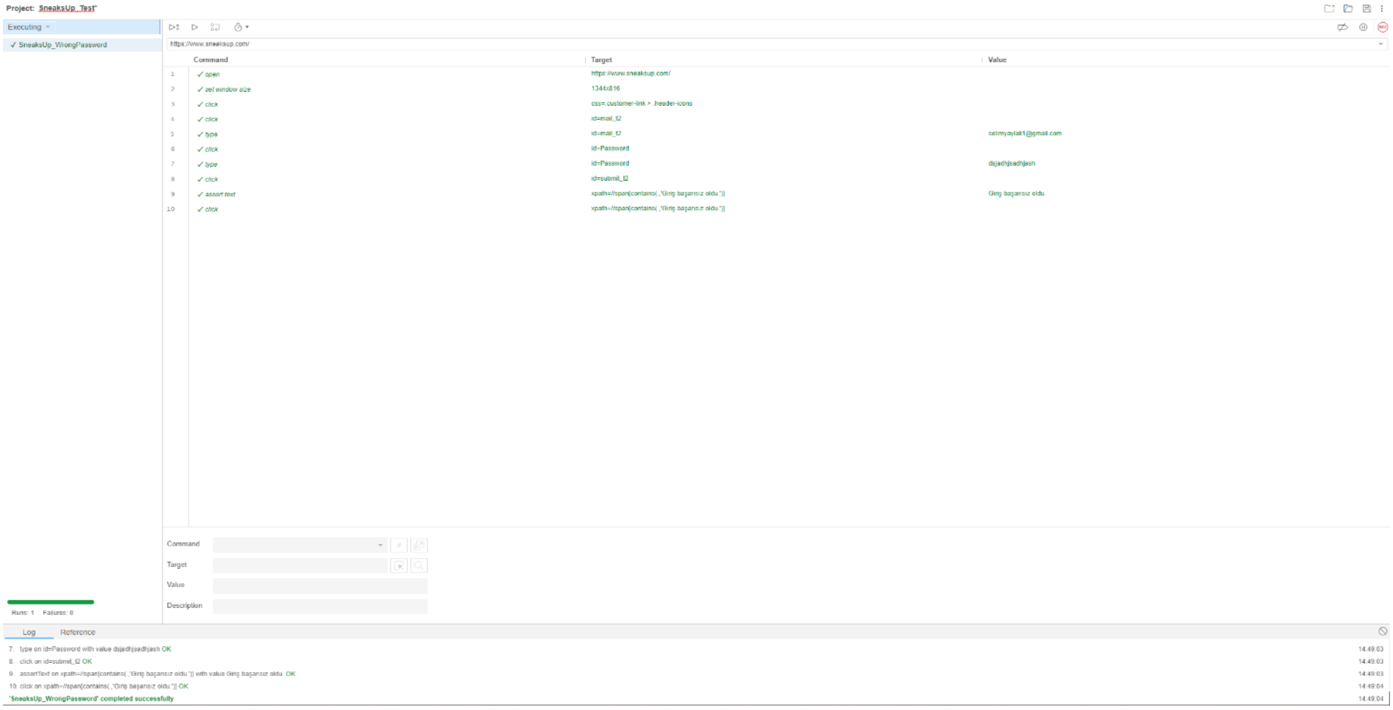
- Log-In Test



	Command	Target	Value
1	✓ open	https://www.sneaksup.com/login	
2	✓ set window size	933x1036	
3	✓ click	id=mail_t2	
4	✓ type	id=mail_t2	yarkinatac2@gmail.com
5	✓ type	id=Password	2235258q
6	✓ click	css=#submit_t2 > .static-text	

```
3.  click on id=mail_t2 OK                                                 13:56:53
4.  type on id=mail_t2 with value yarkinatac2@gmail.com OK                 13:56:54
5.  type on id=Password with value 2235258q OK                             13:56:54
6.  click on css=#submit_t2 > .static-text OK                              13:56:54
'Sneaksup_Login' completed successfully                                    13:56:54
```

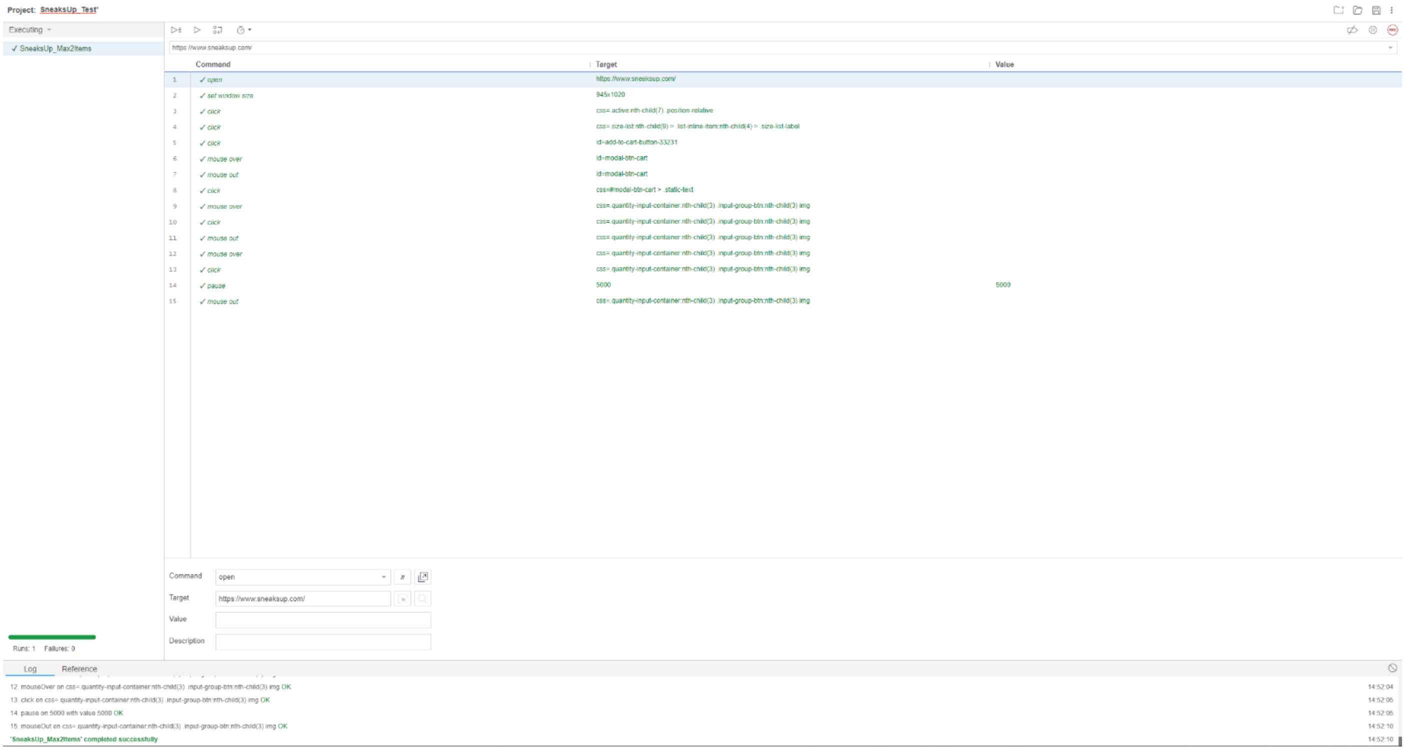
- Invalid Login (Incorrect password)



	Command	Target	Value
1	✓ open	https://www.sneaksup.com/	
2	✓ set window size	1344x816	
3	✓ click	css=.customer-link > .header-icons	
4	✓ click	id=mail_t2	
5	✓ type	id=mail_t2	selimyaylali1@gmail.com
6	✓ click	id=Password	
7	✓ type	id=Password	dsjadhjsadhjash
8	✓ click	id=submit_t2	
9	✓ assert text	xpath=//span[contains(.,'Giriş başarısız oldu.')]	Giriş başarısız oldu.
10	✓ click	xpath=//span[contains(.,'Giriş başarısız oldu.')]	

```
7.  type on id=Password with value dsjadhjsadhjash OK                                                        14:49:03
8.  click on id=submit_t2 OK                                                                                 14:49:03
9.  assertText on xpath=//span[contains(.,'Giriş başarısız oldu.')] with value Giriş başarısız oldu. OK       14:49:03
10. click on xpath=//span[contains(.,'Giriş başarısız oldu.')] OK                                           14:49:04
'SneaksUp_WrongPassword' completed successfully                                                             14:49:04
```

- Max 2 pairs of the Same Item Can be Added to Cart Test



Project: SneaksUp_Test*

Executing

✓ SneaksUp_Max2Items

https://www.sneaksup.com/

	Command	Target	Value
1	✓ open	https://www.sneeksup.com/	
2	✓ set window size	945x1020	
3	✓ click	css=.active:nth-child(7) .position-relative	
4	✓ click	css=.size-list:nth-child(9) > .list-inline-item:nth-child(4) > .size-list-label	
5	✓ click	id=add-to-cart-button-33231	
6	✓ mouse over	id=modal-btn-cart	
7	✓ mouse out	id=modal-btn-cart	
8	✓ click	css=#modal-btn-cart > .static-text	
9	✓ mouse over	css=.quantity-input-container:nth-child(3) .input-group-btn:nth-child(3) img	
10	✓ click	css=.quantity-input-container:nth-child(3) .input-group-btn:nth-child(3) img	
11	✓ mouse out	css=.quantity-input-container:nth-child(3) .input-group-btn:nth-child(3) img	
12	✓ mouse over	css=.quantity-input-container:nth-child(3) .input-group-btn:nth-child(3) img	
13	✓ click	css=.quantity-input-container:nth-child(3) .input-group-btn:nth-child(3) img	
14	✓ pause	5000	5000
15	✓ mouse out	css=.quantity-input-container:nth-child(3) .input-group-btn:nth-child(3) img	

Command: open

Target: https://www.sneaksup.com/

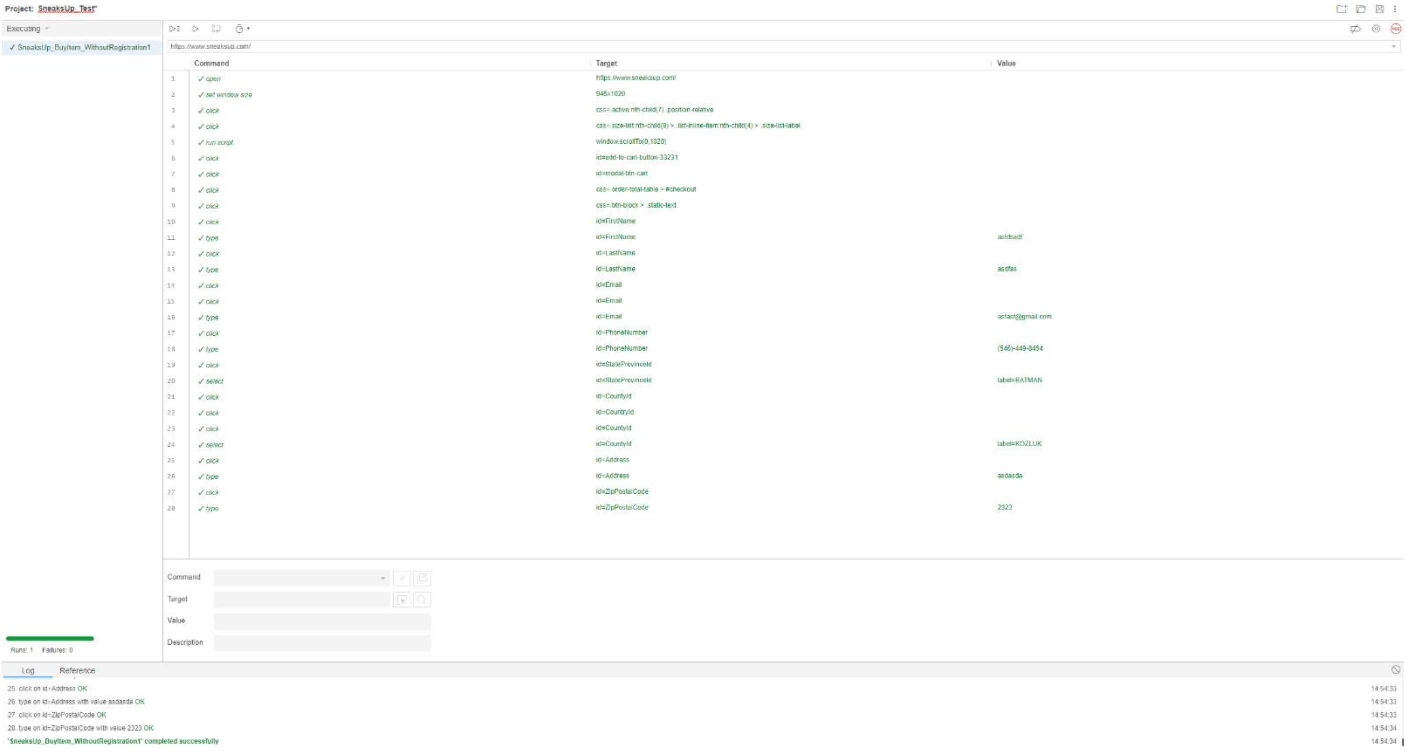
Value:

Description:

Runs: 1 Failures: 0

```
12. mouseOver on css=.quantity-input-container:nth-child(3) .input-group-btn:nth-child(3) img OK    14:52:04
13. click on css=.quantity-input-container:nth-child(3) .input-group-btn:nth-child(3) img OK        14:52:05
14. pause on 5000 with value 5000 OK                                                                14:52:05
15. mouseOut on css=.quantity-input-container:nth-child(3) .input-group-btn:nth-child(3) img OK     14:52:10
'SneaksUp_Max2Items' completed successfully                                                         14:52:10
```

- Buy without registration



Project: SneaksUp_Test*

Executing

✓ SneaksUp_BuyItem_WithoutRegistration1

https://www.sneaksup.com/

	Command	Target	Value
1	✓ open	https://www.sneeksup.com/	
2	✓ set window size	945x1020	
3	✓ click	css=.active:nth-child(7) .position-relative	
4	✓ click	css=.size-list:nth-child(9) > .list-inline-item:nth-child(4) > .size-list-label	
5	✓ run script	window.scrollTo(0,1020)	
6	✓ click	id=add-to-cart-button-33231	
7	✓ click	id=modal-btn-cart	
8	✓ click	css=.order-total-table > #checkout	
9	✓ click	css=.btn-block > .static-text	
10	✓ click	id=FirstName	
11	✓ type	id=FirstName	asfdsadf
12	✓ click	id=LastName	
13	✓ type	id=LastName	asdfas
14	✓ click	id=Email	
15	✓ click	id=Email	
16	✓ type	id=Email	asfasf@gmail.com
17	✓ click	id=PhoneNumber	
18	✓ type	id=PhoneNumber	(546)-449-8454
19	✓ click	id=StateProvinceId	
20	✓ select	id=StateProvinceId	label=BATMAN
21	✓ click	id=CountyId	
22	✓ click	id=CountryId	
23	✓ click	id=CountyId	
24	✓ select	id=CountyId	label=KOZLUK
25	✓ click	id=Address	
26	✓ type	id=Address	asdasda
27	✓ click	id=ZipPostalCode	
28	✓ type	id=ZipPostalCode	2323

Command:

Target:

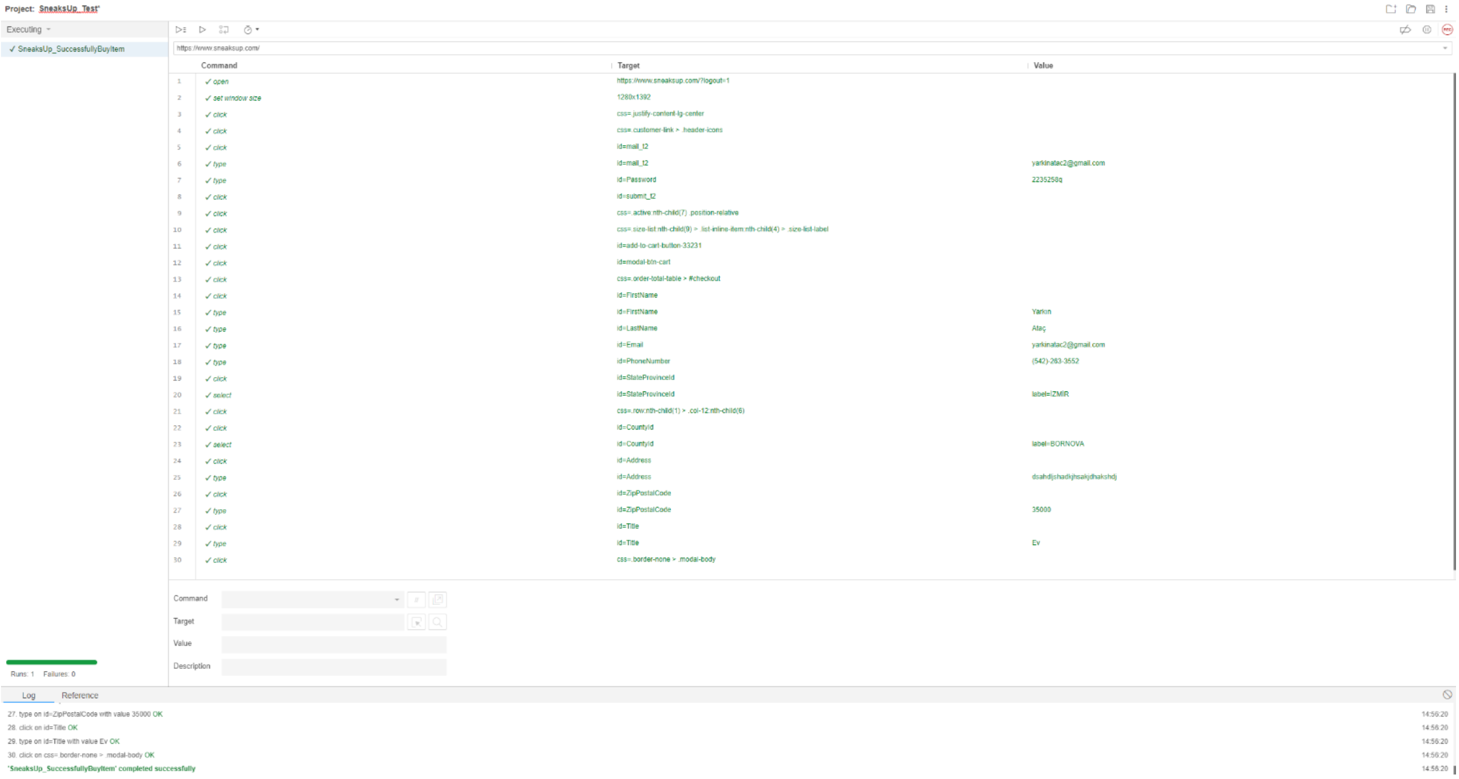
Value:

Description:

Runs: 1 Failures: 0

```
25. click on id=Address OK                                                 14:54:33
26. type on id=Address with value asdasda OK                               14:54:33
27. click on id=ZipPostalCode OK                                           14:54:33
28. type on id=ZipPostalCode with value 2323 OK                            14:54:34
'SneaksUp_BuyItem_WithoutRegistration1' completed successfully             14:54:34
```

- Successful Order



Project: SneaksUp_Test*

Executing

✓ SneaksUp_SuccessfullyBuyItem

https://www.sneaksup.com/

	Command	Target	Value
1	✓ open	https://www.sneaksup.com/?logout=1	
2	✓ set window size	1280x1392	
3	✓ click	css=.justify-content-lg-center	
4	✓ click	css=.customer-link > .header-icons	
5	✓ click	id=mail_t2	
6	✓ type	id=mail_t2	yarkinatac2@gmail.com
7	✓ type	id=Password	2235258q
8	✓ click	id=submit_t2	
9	✓ click	css=.active:nth-child(7) .position-relative	
10	✓ click	css=.size-list:nth-child(9) > .list-inline-item:nth-child(4) > .size-list-label	
11	✓ click	id=add-to-cart-button-33231	
12	✓ click	id=modal-btn-cart	
13	✓ click	css=.order-total-table > #checkout	
14	✓ click	id=FirstName	
15	✓ type	id=FirstName	Yarkın
16	✓ type	id=LastName	Ataç
17	✓ type	id=Email	yarkinatac2@gmail.com
18	✓ type	id=PhoneNumber	(542)-283-3552
19	✓ click	id=StateProvinceId	
20	✓ select	id=StateProvinceId	label=İZMİR
21	✓ click	css=.row:nth-child(1) > .col-12:nth-child(6)	
22	✓ click	id=CountyId	
23	✓ select	id=CountyId	label=BORNOVA
24	✓ click	id=Address	
25	✓ type	id=Address	dsahdljshadkjhsakjdhakshdj
26	✓ click	id=ZipPostalCode	
27	✓ type	id=ZipPostalCode	35000
28	✓ click	id=Title	
29	✓ type	id=Title	Ev
30	✓ click	css=.border-none > .modal-body	

Command

Target

Value

Description

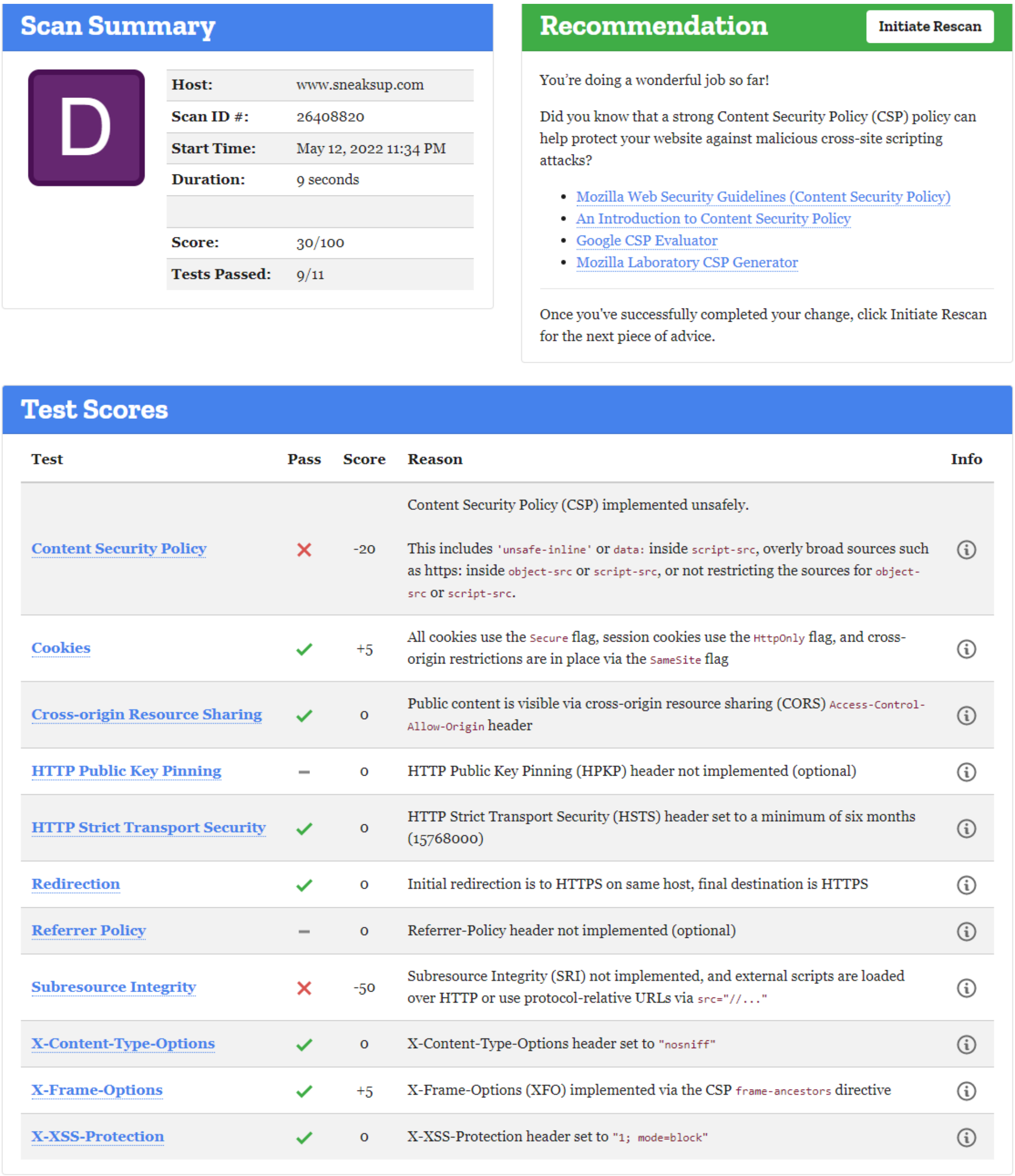
Runs: 1   Failures: 0

Log   Reference

```
27. type on id=ZipPostalCode with value 35000 OK                14:56:20
28. click on id=Title OK                                         14:56:20
29. type on id=Title with value Ev OK                            14:56:20
30. click on css=.border-none > .modal-body OK                   14:56:20
'SneaksUp_SuccessfullyBuyItem' completed successfully            14:56:20
```

2.2 Security Testing

For security testing, we used (https://observatory.mozilla.org/).



Scan Summary

D

Host:	www.sneaksup.com
Scan ID #:	26408820
Start Time:	May 12, 2022 11:34 PM
Duration:	9 seconds
Score:	30/100
Tests Passed:	9/11

Recommendation

You're doing a wonderful job so far!

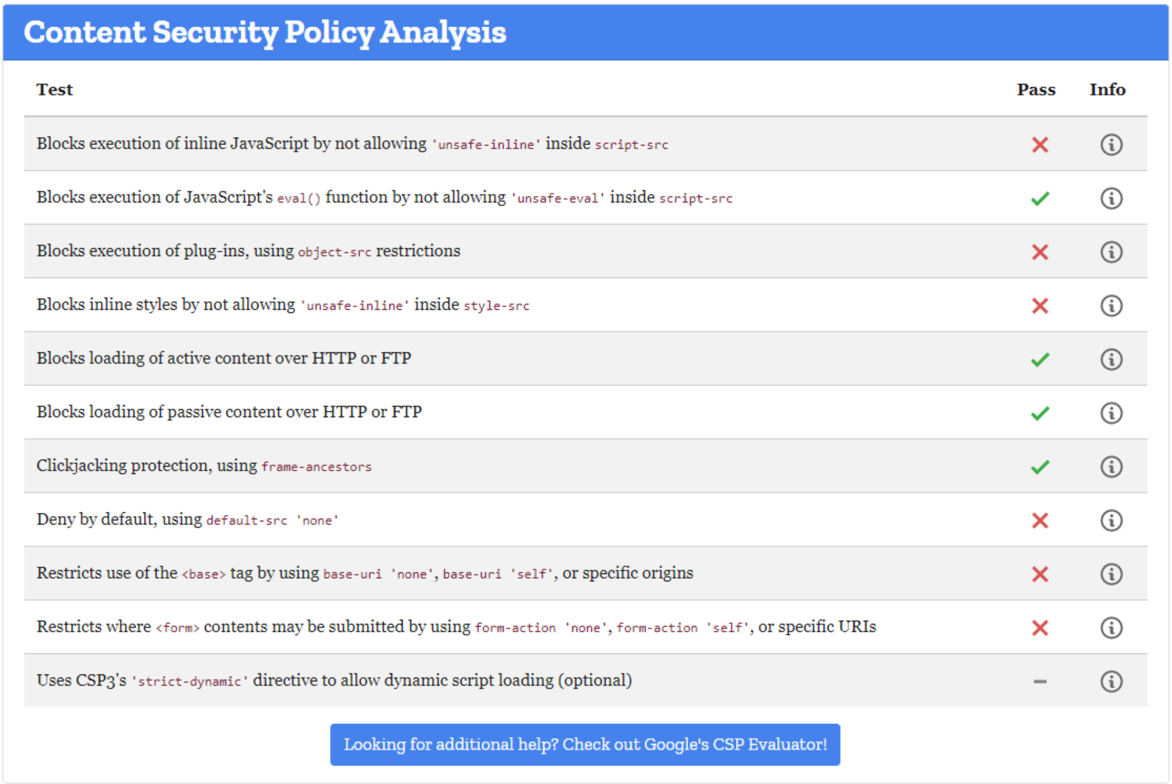
Did you know that a strong Content Security Policy (CSP) policy can help protect your website against malicious cross-site scripting attacks?

- Mozilla Web Security Guidelines (Content Security Policy)
- An Introduction to Content Security Policy
- Google CSP Evaluator
- Mozilla Laboratory CSP Generator

Once you've successfully completed your change, click Initiate Rescan for the next piece of advice.

Test Scores

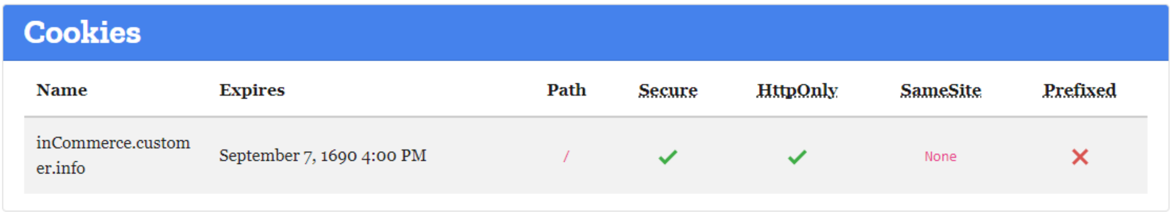
Test	Pass	Score	Reason	Info
Content Security Policy	✗	-20	Content Security Policy (CSP) implemented unsafely. This includes `'unsafe-inline'` or `data:` inside `script-src`, overly broad sources such as https: inside `object-src` or `script-src`, or not restricting the sources for `object-src` or `script-src`.	ⓘ
Cookies	✓	+5	All cookies use the `Secure` flag, session cookies use the `HttpOnly` flag, and cross-origin restrictions are in place via the `SameSite` flag	ⓘ
Cross-origin Resource Sharing	✓	0	Public content is visible via cross-origin resource sharing (CORS) `Access-Control-Allow-Origin` header	ⓘ
HTTP Public Key Pinning	–	0	HTTP Public Key Pinning (HPKP) header not implemented (optional)	ⓘ
HTTP Strict Transport Security	✓	0	HTTP Strict Transport Security (HSTS) header set to a minimum of six months (15768000)	ⓘ
Redirection	✓	0	Initial redirection is to HTTPS on same host, final destination is HTTPS	ⓘ
Referrer Policy	–	0	Referrer-Policy header not implemented (optional)	ⓘ
Subresource Integrity	✗	-50	Subresource Integrity (SRI) not implemented, and external scripts are loaded over HTTP or use protocol-relative URLs via `src="//..."`	ⓘ
X-Content-Type-Options	✓	0	X-Content-Type-Options header set to `"nosniff"`	ⓘ
X-Frame-Options	✓	+5	X-Frame-Options (XFO) implemented via the CSP `frame-ancestors` directive	ⓘ
X-XSS-Protection	✓	0	X-XSS-Protection header set to `"1; mode=block"`	ⓘ



Content Security Policy Analysis

Test	Pass	Info
Blocks execution of inline JavaScript by not allowing `'unsafe-inline'` inside `script-src`	✗	ⓘ
Blocks execution of JavaScript's `eval()` function by not allowing `'unsafe-eval'` inside `script-src`	✓	ⓘ
Blocks execution of plug-ins, using `object-src` restrictions	✗	ⓘ
Blocks inline styles by not allowing `'unsafe-inline'` inside `style-src`	✗	ⓘ
Blocks loading of active content over HTTP or FTP	✓	ⓘ
Blocks loading of passive content over HTTP or FTP	✓	ⓘ
Clickjacking protection, using `frame-ancestors`	✓	ⓘ
Deny by default, using `default-src 'none'`	✗	ⓘ
Restricts use of the `<base>` tag by using `base-uri 'none'`, `base-uri 'self'`, or specific origins	✗	ⓘ
Restricts where `<form>` contents may be submitted by using `form-action 'none'`, `form-action 'self'`, or specific URIs	✗	ⓘ
Uses CSP3's `'strict-dynamic'` directive to allow dynamic script loading (optional)	–	ⓘ

Looking for additional help? Check out Google's CSP Evaluator!



Cookies

Name	Expires	Path	Secure	HttpOnly	SameSite	Prefixed
inCommerce.customer.info	September 7, 1690 4:00 PM	/	✓	✓	None	✗

2.3 Usability Testing:

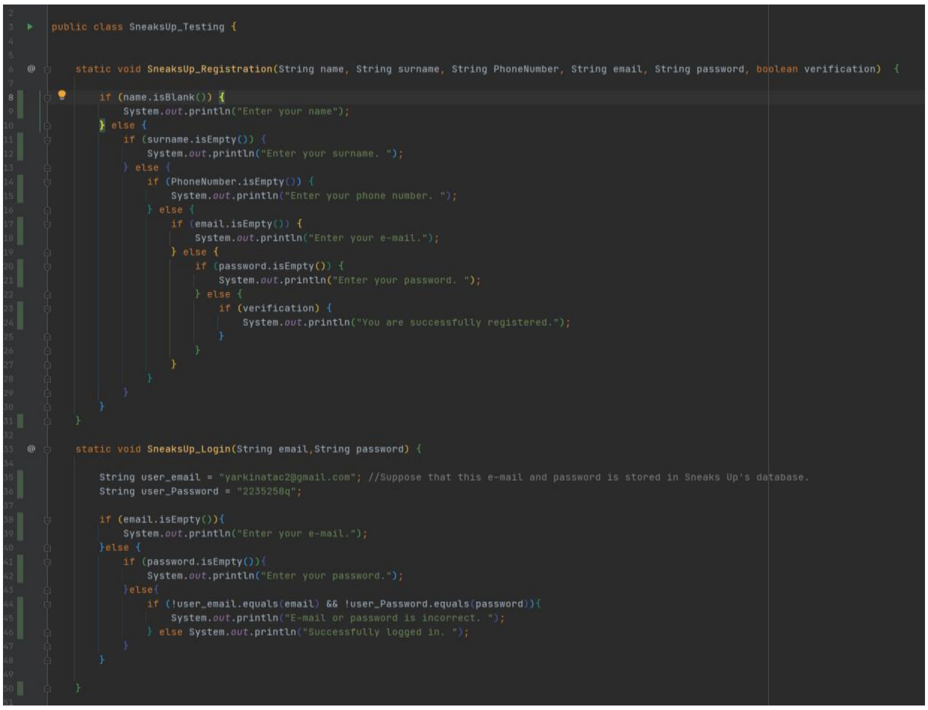
We tested the website on several different browsers, and we come to conclusion that the website works correctly in each browser listed.

- Google Chrome
- Mozilla Firefox
- Brave
- Safari
- Opera
- Microsoft Edge

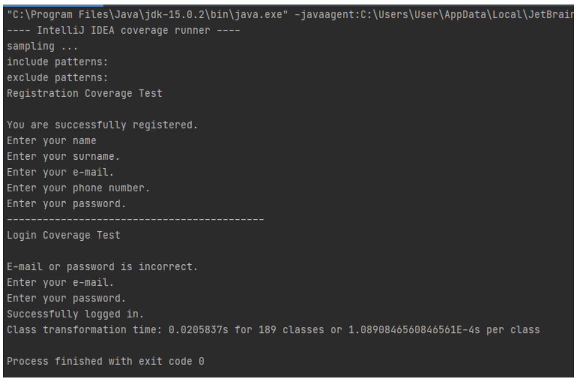
2.4 Coverage Analysis:

We tried to create our own Sneaks Up. We tried to imagine how the system works and we wrote a simple code about it.

At the first image there are two methods which takes parameters. First one is a simple method for the Register action. Second one is a simple method for the Login action.

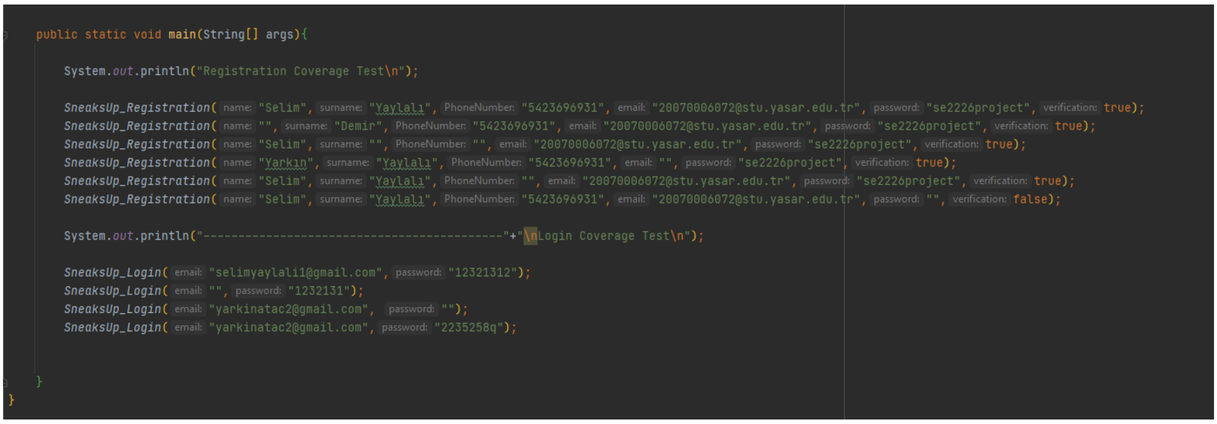


```java
public class SneaksUp_Testing {


    static void SneaksUp_Registration(String name, String surname, String PhoneNumber, String email, String password, boolean verification)  {

        if (name.isBlank()) {
            System.out.println("Enter your name");
        } else {
            if (surname.isEmpty()) {
                System.out.println("Enter your surname. ");
            } else {
                if (PhoneNumber.isEmpty()) {
                    System.out.println("Enter your phone number. ");
                } else {
                    if (email.isEmpty()) {
                        System.out.println("Enter your e-mail.");
                    } else {
                        if (password.isEmpty()) {
                            System.out.println("Enter your password. ");
                        } else {
                            if (verification) {
                                System.out.println("You are successfully registered.");
                            }
                        }
                    }
                }
            }
        }
    }

    static void SneaksUp_Login(String email,String password) {

        String user_email = "yarkinatac2@gmail.com"; //Suppose that this e-mail and password is stored in Sneaks Up's database.
        String user_Password = "2235258q";

        if (email.isEmpty()){
            System.out.println("Enter your e-mail.");
        }else {
            if (password.isEmpty()){
                System.out.println("Enter your password.");
            }else{
                if (!user_email.equals(email) && !user_Password.equals(password)){
                    System.out.println("E-mail or password is incorrect. ");
                } else System.out.println("Successfully logged in. ");
            }
        }

    }
```

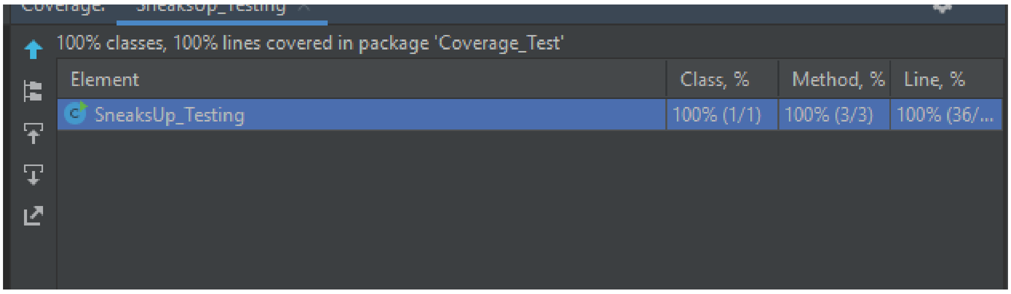


```
"C:\Program Files\Java\jdk-15.0.2\bin\java.exe" -javaagent:C:\Users\User\AppData\Local\JetBrain
---- IntelliJ IDEA coverage runner ----
sampling ...
include patterns:
exclude patterns:
Registration Coverage Test

You are successfully registered.
Enter your name
Enter your surname.
Enter your e-mail.
Enter your phone number.
Enter your password.
-------------------------------------------
Login Coverage Test

E-mail or password is incorrect.
Enter your e-mail.
Enter your password.
Successfully logged in.
Class transformation time: 0.0205837s for 189 classes or 1.0890846560846561E-4s per class

Process finished with exit code 0
```

As you can see when we run with coverage it gets in every line of the code we have written with the correct inputs. We can visualize how the system works with this simple coverage analysis.



```java
    public static void main(String[] args){

        System.out.println("Registration Coverage Test\n");

        SneaksUp_Registration( name: "Selim", surname: "Yaylalı", PhoneNumber: "5423696931", email: "20070006072@stu.yasar.edu.tr", password: "se2226project", verification: true);
        SneaksUp_Registration( name: "", surname: "Demir", PhoneNumber: "5423696931", email: "20070006072@stu.yasar.edu.tr", password: "se2226project", verification: true);
        SneaksUp_Registration( name: "Selim", surname: "", PhoneNumber: "", email: "20070006072@stu.yasar.edu.tr", password: "se2226project", verification: true);
        SneaksUp_Registration( name: "Yarkın", surname: "Yaylalı", PhoneNumber: "5423696931", email: "", password: "se2226project", verification: true);
        SneaksUp_Registration( name: "Selim", surname: "Yaylalı", PhoneNumber: "", email: "20070006072@stu.yasar.edu.tr", password: "se2226project", verification: true);
        SneaksUp_Registration( name: "Selim", surname: "Yaylalı", PhoneNumber: "5423696931", email: "20070006072@stu.yasar.edu.tr", password: "", verification: false);

        System.out.println("-------------------------------------------"+"\nLogin Coverage Test\n");

        SneaksUp_Login( email: "selimyaylali1@gmail.com", password: "12321312");
        SneaksUp_Login( email: "", password: "1232131");
        SneaksUp_Login( email: "yarkinatac2@gmail.com",  password: "");
        SneaksUp_Login( email: "yarkinatac2@gmail.com", password: "2235258q");


    }
}
```



100% classes, 100% lines covered in package 'Coverage_Test'

Element	Class, %	Method, %	Line, %
SneaksUp_Testing	100% (1/1)	100% (3/3)	100% (36/...