

Installation and Usage of DVWA for SQL Injection Testing

ADITHYAN SHABU

CONTENTS

Installation of DVWA using Docker	2
Performing SQL Injection on DVWA	4
SQL Injection (Low Security Level)	4
SQL Injection (Medium Security Level)	5
SQL Injection (High Security Level)	7
Conclusion	9

1. Installation of DVWA in Docker

I employed Docker to make the installation of Damn Vulnerable Web Application (DVWA) less tedious. Here is the summary of the steps involved in completing the installation:

a. Clone the Repository

First step was to clone the DVWA repository from [pentestlab.github.io](https://github.com/eystsen/pentestlab.git) using the following command:

```
git clone https://github.com/eystsen/pentestlab.git
```

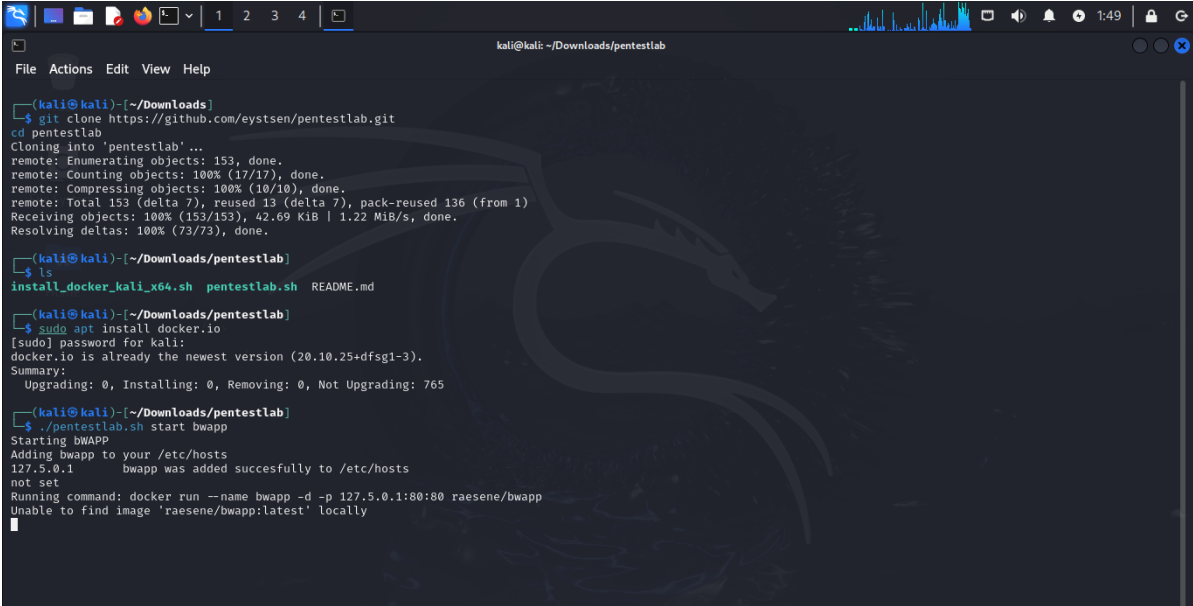
b. Start the Docker Container

I went into the DVWA folder after cloning the repository, and with a series of Docker commands, I started and fired the engines.

c. Opened the terminal and went into the cloned pentestlab folder

d. Ran the following command to install Docker container

```
sudo apt install docker.io
```



```
kali@kali: ~/Downloads/pentestlab
File Actions Edit View Help

(kali@kali)~/Downloads
$ git clone https://github.com/eystsen/pentestlab.git
Cloning into 'pentestlab'...
remote: Enumerating objects: 153, done.
remote: Counting objects: 100% (17/17), done.
remote: Compressing objects: 100% (10/10), done.
remote: Total 153 (delta 7), reused 13 (delta 7), pack-reused 136 (from 1)
Receiving objects: 100% (153/153), 42.69 KiB | 1.22 MiB/s, done.
Resolving deltas: 100% (73/73), done.

(kali@kali)~/Downloads/pentestlab
$ ls
install_docker_kali_x64.sh  pentestlab.sh  README.md

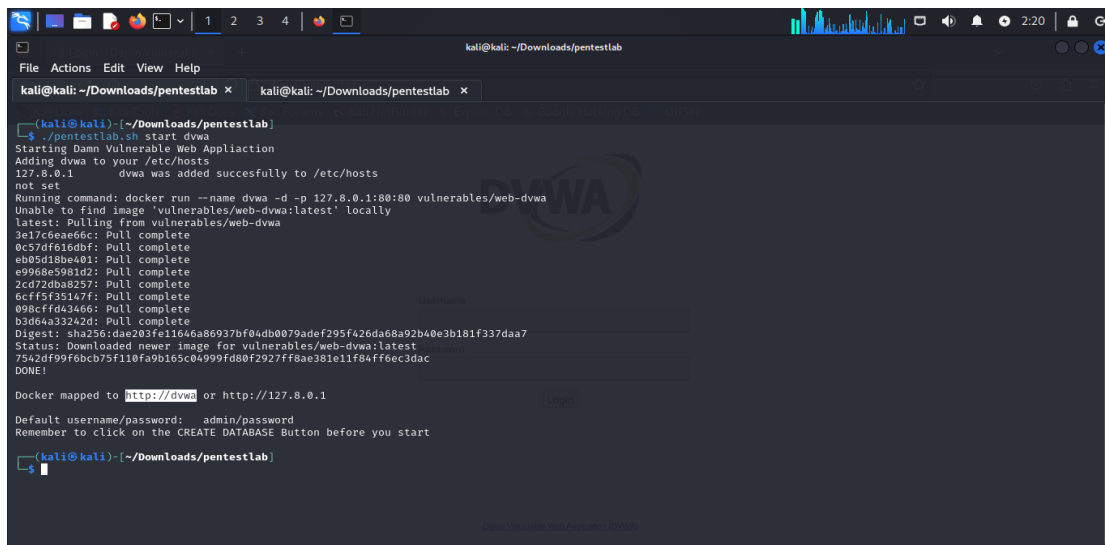
(kali@kali)~/Downloads/pentestlab
$ sudo apt install docker.io
[sudo] password for kali:
docker.io is already the newest version (20.10.25+dfsg1-3).
Summary:
  Upgrading: 0, Installing: 0, Removing: 0, Not Upgrading: 765

(kali@kali)~/Downloads/pentestlab
$ ./pentestlab.sh start bwapp
Starting BWAPP
Adding bwapp to your /etc/hosts
127.5.0.1      bwapp was added succesfully to /etc/hosts
not set
Running command: docker run --name bwapp -d -p 127.5.0.1:80:80 raesene/bwapp
Unable to find image 'raesene/bwapp:latest' locally
```

e. Accessing to the DVWA Web Page

After starting the Docker container, I executed the following command to access the DVWA web page

./pentestlab.sh start dvwa



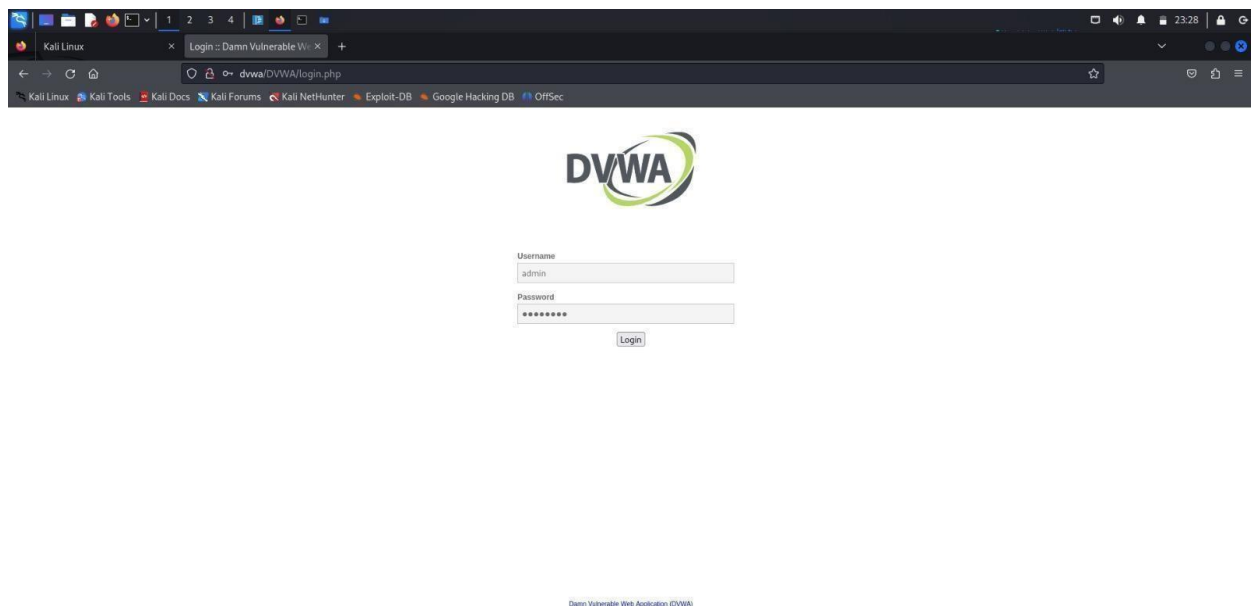
```
kali@kali: ~/Downloads/pentestlab
File Actions Edit View Help
kali@kali: ~/Downloads/pentestlab x kali@kali: ~/Downloads/pentestlab x
(kali@kali) - [~/Downloads/pentestlab]
$ ./pentestlab.sh start dvwa
Starting Damn Vulnerable Web Application
Adding dvwa to your /etc/hosts
127.8.0.1 dvwa was added successfully to /etc/hosts
not set
Running command: docker run --name dvwa -d -p 127.8.0.1:80:80 vulnerables/web-dvwa
Unable to find image 'vulnerables/web-dvwa:latest' locally
latest: Pulling from vulnerables/web-dvwa
3e17c6eae66c: Pull complete
0c57df616dbf: Pull complete
eb05d18be401: Pull complete
e9968e5981d2: Pull complete
2cd72dba8257: Pull complete
6cff5f35147f: Pull complete
098cffd43466: Pull complete
b3d64a3242d: Pull complete
Digest: sha256:dae203fe11646a86937bf04db0079adef295f426da6a92b40e3b181f337daa7
Status: Downloaded newer image for vulnerables/web-dvwa:latest
7542df99f6cb75f110fa9b165c04999fd80f2927ff8ae381e11f84ffec3dac
DONE!

Docker mapped to http://dvwa or http://127.8.0.1
Default username/password: admin/password
Remember to click on the CREATE DATABASE Button before you start
(kali@kali) - [~/Downloads/pentestlab]
$
```

f. Logging In

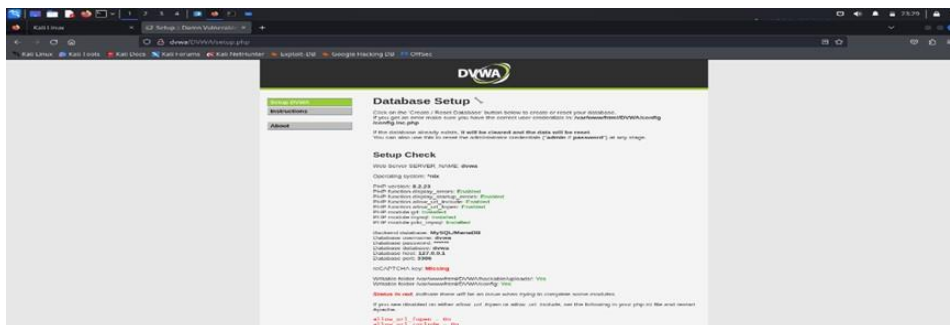
At the login page, I used the default credentials:

- Username: admin
- Password: password



g. Resetting the Database

Reset the database, after logging in for the first time. Then click the "Reset Database" button. The system redirected me back to the login page, Once the reset was completed.



h. Logging In Again

After resetting the database, I once again used the default credentials to gain access to the DVWA dashboard

i. Completion

At this point, the DVWA setup was complete, and ready for vulnerability testing.

2. Performing SQL Injection on DVWA

a. SQL Injection (Low Security Level)

I began by testing SQL injection on the Low security level.

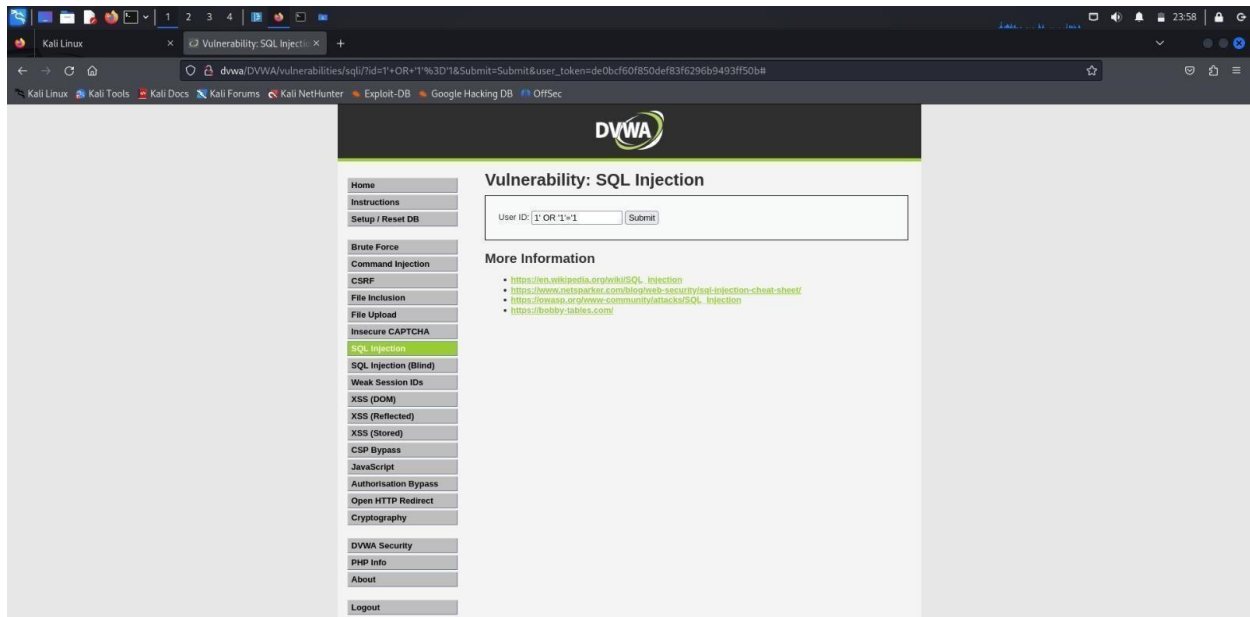
i. Initial Injection

I quickly identified the input field for injecting SQL code, after accessing the SQL injection page.

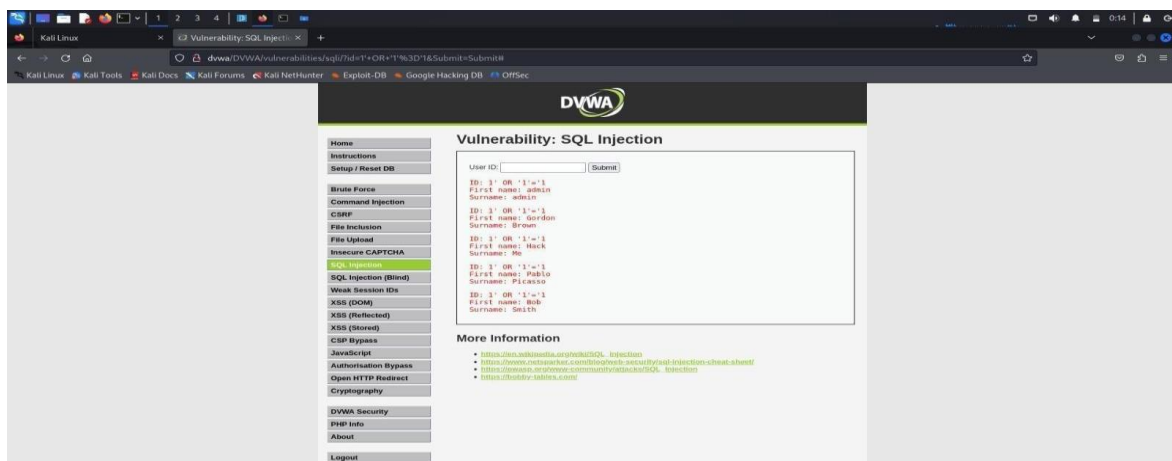
ii. SQL Payload

The following basic SQL injection string is used:

1' OR '1'='1



This clever payload circumvented the requirement for valid input and proceeded to reveal the first names and surnames of all users

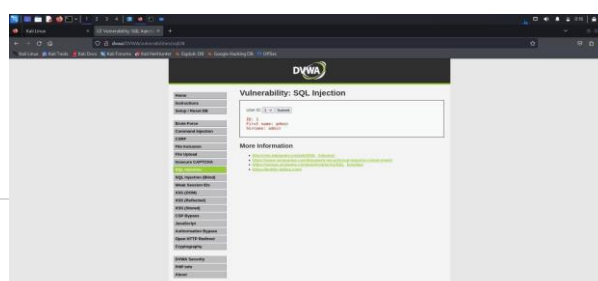


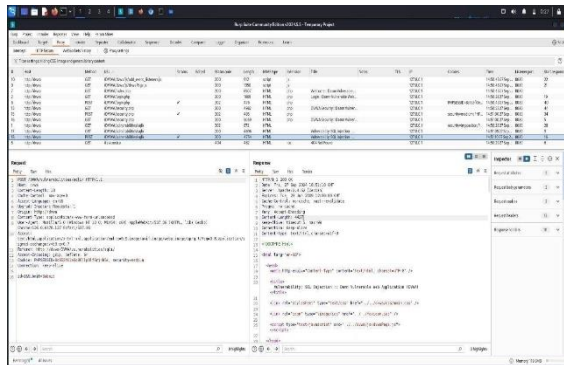
b. SQL Injection (Medium Security Level)

I changed the DVWA security setting to Medium and conducted the test with an enhanced payload.

i. Using Burp Suite

I employed Burp Suite to intercept the HTTP request and then tweaked the ID parameter in the request, injecting a more sophisticated SQL string

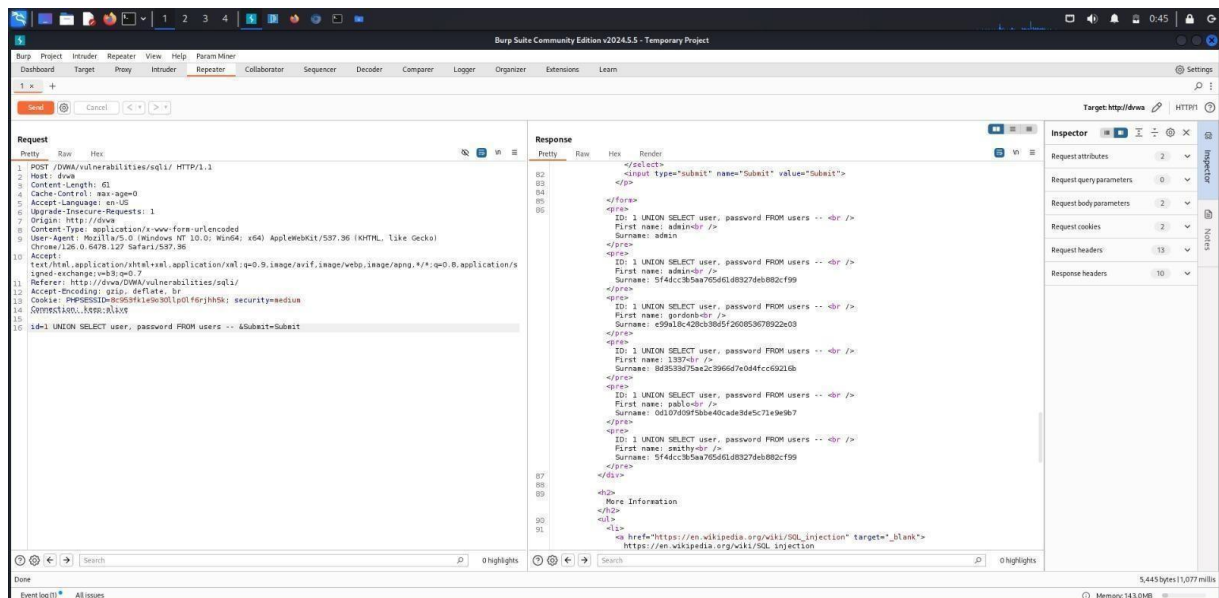




ii. SQL Injection String

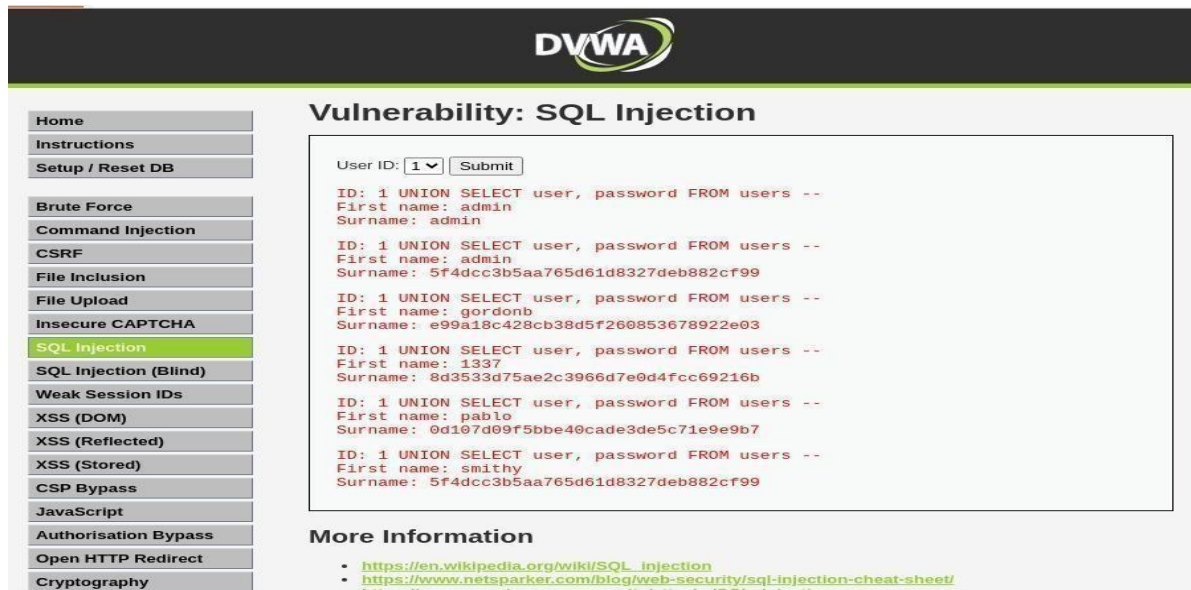
I inserted the following payload into the `id` field:

1 UNION SELECT user, password FROM users--



iii. Execution

After modifying the request in Burp Suite. I sent it to the server. As a result, I was able to extract usernames and passwords from the system's response.

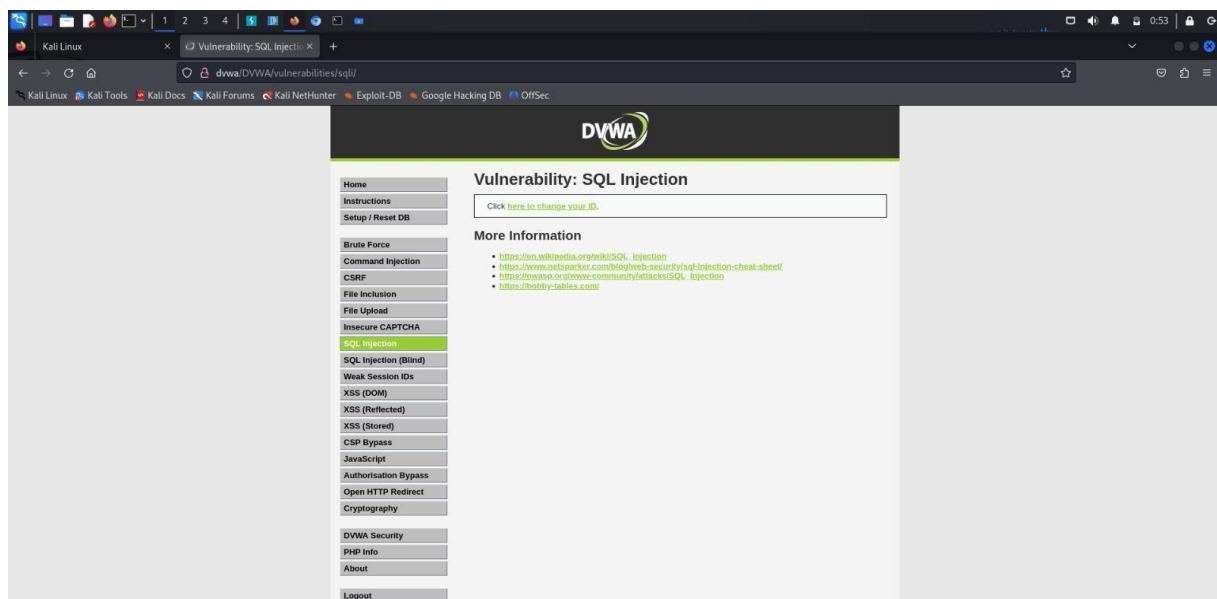


c. SQL Injection (High Security Level)

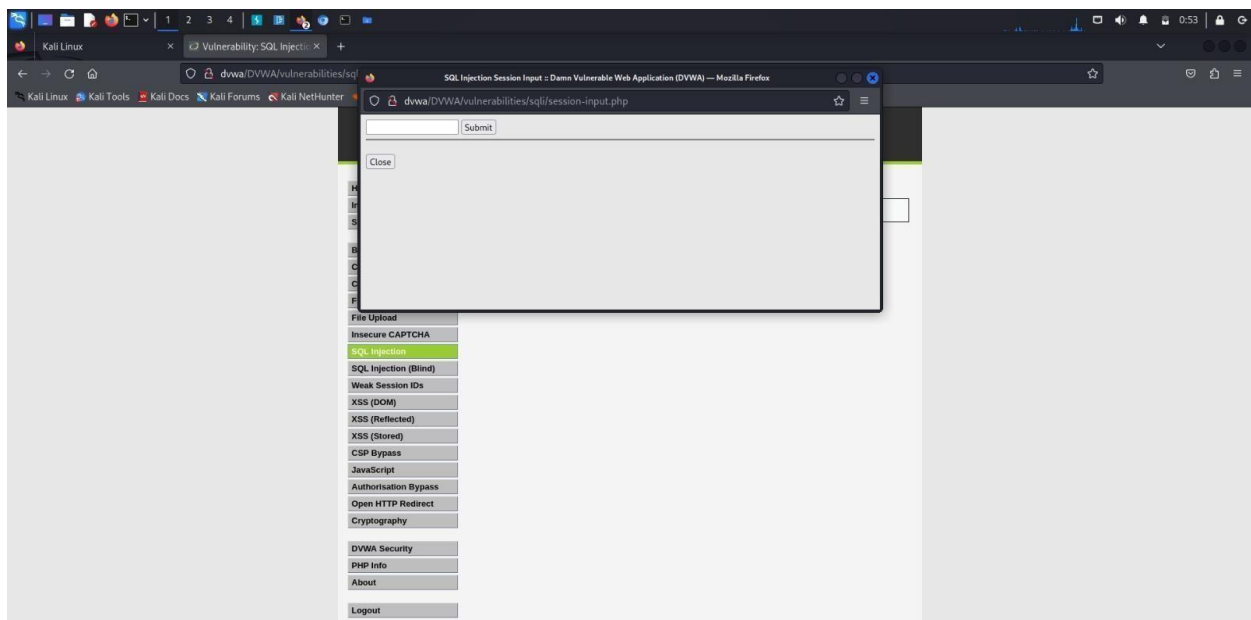
Finally, I tested SQL injection on the High security level.

i. Identifying the Injection Point

After selecting the 'Here to Change your ID' button, you'll notice a slight difference in the interface at the high security level

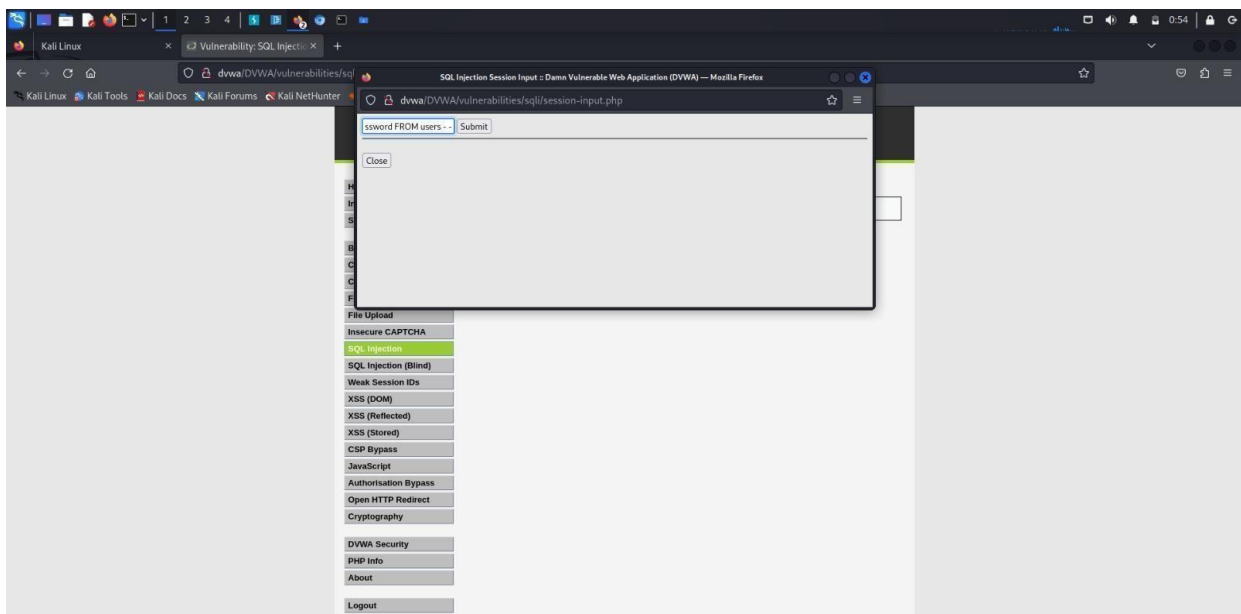


and there is a new window appeared where I could input SQL command.



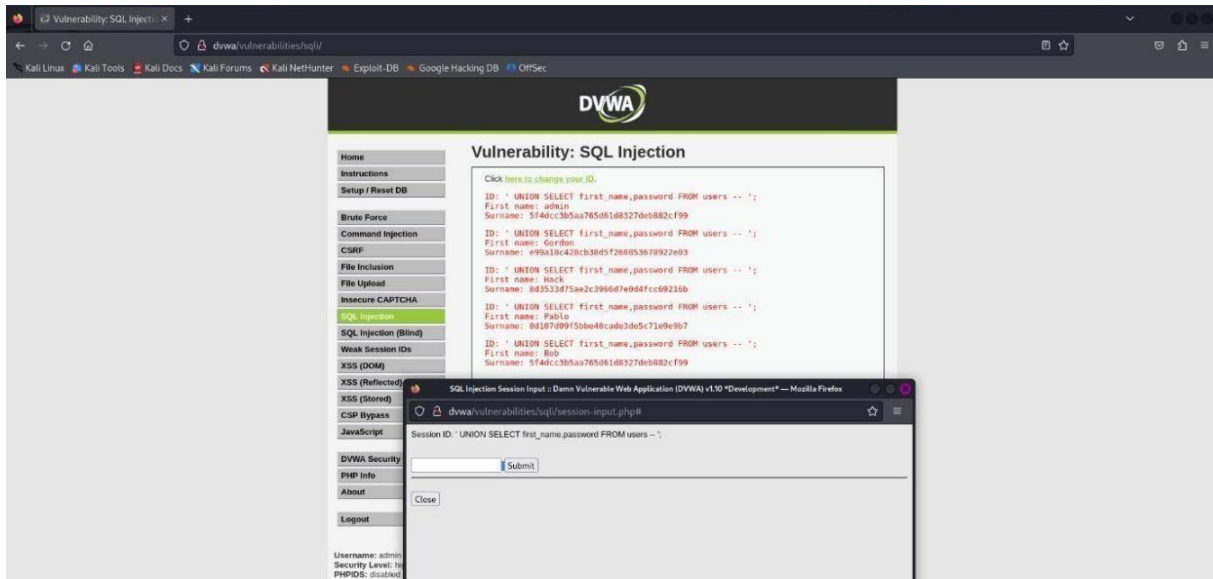
i. Injection Payload

I inserted the following SQL injection string: '
UNION SELECT user, password FROM users - -



i. Results

After executing the provided code, I was able to confirm the vulnerability even under the most stringent security settings



Conclusion

After setting up DVWA via docker,I conducted SQL injection tests at varying security levels Employing both basic and advanced SQL injection payloads along with Burp Suite for request interception,I successfully retrieved sensitive data from the database across all security configurations ,effectively showcasing the vulnerabilities.

