TASK 1: WEB APPLICATION SECURITY TESTING

In this task we are going to test the web application for vulnerabilities by using cross site scripting, sql injections, authentication failures.

Open kali linux and first step is to update and download the mariadb server using the below commands.

sudo apt update

sudo apt install git

git cole https://github.com/digininja/DVWA.git

```
File  Actions  Edit  View  Help
MariaDB [(none)]> EXIT;
Bye

┌──(kali㉿kali)-[~]
└─$

┌──(kali㉿kali)-[~]
└─$ sudo apt update
sudo apt install git
git clone https://github.com/digininja/DVWA.git

Get:1 http://kali.download/kali kali-rolling InRelease [41.5 kB]
Get:2 http://kali.download/kali kali-rolling/main amd64 Packages [21.0 MB]
Get:3 http://kali.download/kali kali-rolling/main amd64 Contents (deb) [52.0 MB]
Fetched 73.1 MB in 28s (2,631 kB/s)
883 packages can be upgraded. Run 'apt list --upgradable' to see them.
git is already the newest version (1:2.47.2-0.1).
Summary:
  Upgrading: 0, Installing: 0, Removing: 0, Not Upgrading: 883
Cloning into 'DVWA'...
remote: Enumerating objects: 5360, done.
remote: Counting objects: 100% (176/176), done.
remote: Compressing objects: 100% (65/65), done.
remote: Total 5360 (delta 149), reused 111 (delta 111), pack-reused 5184 (from 4)
Receiving objects: 100% (5360/5360), 2.69 MiB | 5.02 MiB/s, done.
Resolving deltas: 100% (2633/2633), done.

┌──(kali㉿kali)-[~]
└─$ sudo mv DVWA /var/www/html/dvwa


┌──(kali㉿kali)-[~]
└─$ sudo chown -R www-data:www-data /var/www/html/dvwa
sudo chmod -R 755 /var/www/html/dvwa


┌──(kali㉿kali)-[~]
└─$ sudo nano /var/www/html/dvwa/config/config.inc.php


┌──(kali㉿kali)-[~]
└─$
```

After downloading I have moved to this destination path /var/www/html/dvwa then changing the owner of dvwa and permissions here 7 is for admin he can read,write, execute but group and other usres can only read and execute dvwa.

sudo systemctl restart apache2

sudo apt install apache2 mariadb-server php libapache2-mod-php php-mysqli php-gd php-curl php-xml php-zip

sudo systemctl restart mariadb

start the apache2 services and download mariadb server then create the database .

```
File  Actions  Edit  View  Help
886 packages can be upgraded. Run 'apt list --upgradable' to see them.
Note, selecting 'php8.4-mysql' instead of 'php-mysqli'
php is already the newest version (2:8.4+96).
libapache2-mod-php is already the newest version (2:8.4+96).
php8.4-mysql is already the newest version (8.4.6-2).
php-gd is already the newest version (2:8.4+96).
php-curl is already the newest version (2:8.4+96).
php-xml is already the newest version (2:8.4+96).
php-zip is already the newest version (2:8.4+96).
Summary:
  Upgrading: 0, Installing: 0, Removing: 0, Not Upgrading: 886

┌──(kali㉿kali)-[~]
└─$ sudo systemctl restart apache2

┌──(kali㉿kali)-[~]
└─$ echo "<?php phpinfo(); ?>" | sudo tee /var/www/html/info.php

<?php phpinfo(); ?>

┌──(kali㉿kali)-[~]
└─$ ls -l /var/www/html/dvwa/config/

total 8
-rw-r--r-- 1 root     root      117 May 12 05:51 config.inc.php
-rwxr-xr-x 1 www-data www-data 2494 May 12 05:46 config.inc.php.dist

┌──(kali㉿kali)-[~]
└─$ sudo cp /var/www/html/dvwa/config/config.inc.php.dist /var/www/html/dvwa/config/config.inc.php

┌──(kali㉿kali)-[~]
└─$ sudo nano /var/www/html/dvwa/config/config.inc.php

┌──(kali㉿kali)-[~]
└─$ sudo systemctl restart apache2

┌──(kali㉿kali)-[~]
└─$
```

```
┌──(kali㉿kali)-[~]
└─$ sudo mysql -u root -p
[sudo] password for kali:
Enter password:
ERROR 2002 (HY000): Can't connect to local server through socket '/run/mysqld/mysqld.sock' (2)

┌──(kali㉿kali)-[~]
└─$ sudo systemctl start mariadb


┌──(kali㉿kali)-[~]
└─$ sudo systemctl status mariadb

● mariadb.service - MariaDB 11.8.1 database server
     Loaded: loaded (/usr/lib/systemd/system/mariadb.service; disabled; preset: disabled)
     Active: active (running) since Mon 2025-05-12 04:56:06 EDT; 1min 57s ago
 Invocation: b412a5d6a183440486b4d913bf87e1a7
       Docs: man:mariadbd(8)
             https://mariadb.com/kb/en/library/systemd/
    Process: 7453 ExecStartPre=/usr/bin/install -m 755 -o mysql -g root -d /var/run/mysqld (code=exited, status=0/SUCCESS)
    Process: 7455 ExecStartPre=/bin/sh -c [ ! -e /usr/bin/galera_recovery ] && VAR= ||  VAR=`/usr/bin/galera_recovery`; [ $? -eq 0 ]   && echo _WSREP_START_POSITION=$VAR > /run/mysqld/wsrep-sta
    Process: 7549 ExecStartPost=/bin/rm -f /run/mysqld/wsrep-start-position (code=exited, status=0/SUCCESS)
    Process: 7551 ExecStartPost=/etc/mysql/debian-start (code=exited, status=0/SUCCESS)
   Main PID: 7508 (mariadbd)
     Status: "Taking your SQL requests now..."
      Tasks: 12 (limit: 14518)
     Memory: 331.2M (peak: 421.2M)
        CPU: 2.938s
     CGroup: /system.slice/mariadb.service
             └─7508 /usr/sbin/mariadbd

May 12 04:56:05 kali mariadbd[7508]: 2025-05-12  4:56:05 0 [Note] InnoDB: Buffer pool(s) load completed at 250512  4:56:05
May 12 04:56:06 kali mariadbd[7508]: 2025-05-12  4:56:06 0 [Note] Server socket created on IP: '127.0.0.1'.
May 12 04:56:06 kali mariadbd[7508]: 2025-05-12  4:56:06 0 [Note] mariadbd: Event Scheduler: Loaded 0 events
May 12 04:56:06 kali mariadbd[7508]: 2025-05-12  4:56:06 0 [Note] /usr/sbin/mariadbd: ready for connections.
May 12 04:56:06 kali mariadbd[7508]: Version: '11.8.1-MariaDB-4'  socket: '/run/mysqld/mysqld.sock'  port: 3306  Debian n/a
May 12 04:56:06 kali systemd[1]: Started mariadb.service - MariaDB 11.8.1 database server.
May 12 04:56:07 kali debian-start[7568]: ────────────
May 12 04:56:07 kali debian-start[7568]: SELECT count(*) FROM mysql.user WHERE user='root' and password='' and password_expired='N' and plugin in ('', 'mysql_native_password', 'mysql_old_passwor
May 12 04:56:07 kali debian-start[7568]: ────────────
May 12 04:56:07 kali debian-start[7568]: ERROR 1267 (HY000) at line 1: Illegal mix of collations (utf8mb4_general_ci,COERCIBLE) and (utf8mb4_uca1400_ai_ci,COERCIBLE) for operation '='
```

```
File  Actions  Edit  View  Help
     Status: "Taking your SQL requests now..."
      Tasks: 12 (limit: 14518)
     Memory: 331.2M (peak: 421.2M)
        CPU: 2.938s
     CGroup: /system.slice/mariadb.service
             └─7508 /usr/sbin/mariadbd

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May 12 04:56:06 kali mariadbd[7508]: 2025-05-12  4:56:06 0 [Note] Server socket created on IP: '127.0.0.1'.
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May 12 04:56:07 kali debian-start[7568]: ──────────────
May 12 04:56:07 kali debian-start[7568]: ERROR 1267 (HY000) at line 1: Illegal mix of collations (utf8mb4_general_ci,COERCIBLE) and (utf8mb4_uca1400_ai_ci,C
lines 1-28/28 (END)
zsh: suspended  sudo systemctl status mariadb

┌──(kali㉿kali)-[~]
└─$ sudo mysql -u root -p

Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 5
Server version: 11.8.1-MariaDB-4 Debian n/a

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Support MariaDB developers by giving a star at https://github.com/MariaDB/server
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> CREATE DATABASE my_database;
Query OK, 1 row affected (0.067 sec)

MariaDB [(none)]> CREATE USER 'my_user'@'localhost' IDENTIFIED BY 'my_password';
Query OK, 0 rows affected (0.069 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON my_database.* TO 'my_user'@'localhost';
Query OK, 0 rows affected (0.001 sec)
```
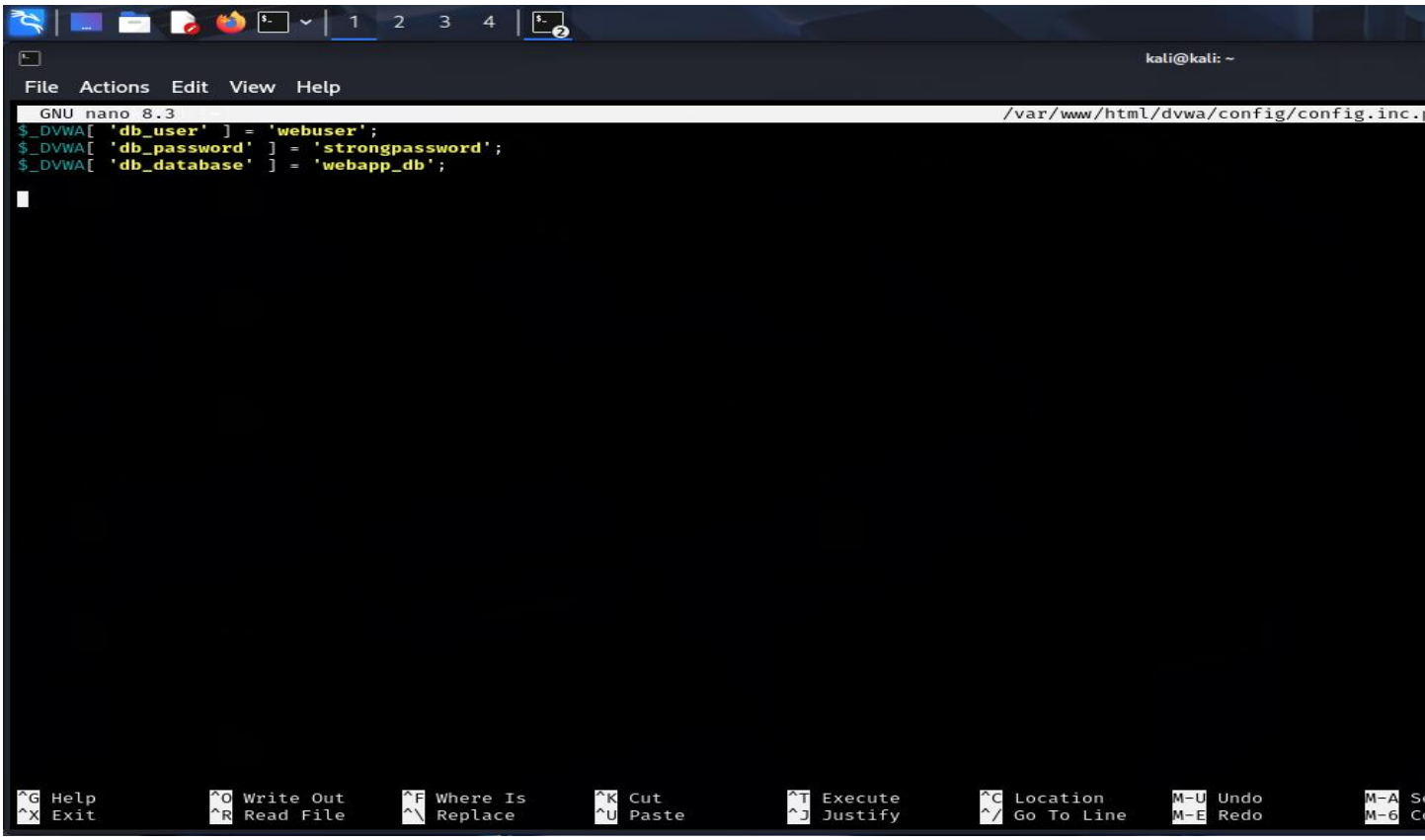

Now open config file which is at /var/www/html/dvwa/config/config.inc.php add the below commands

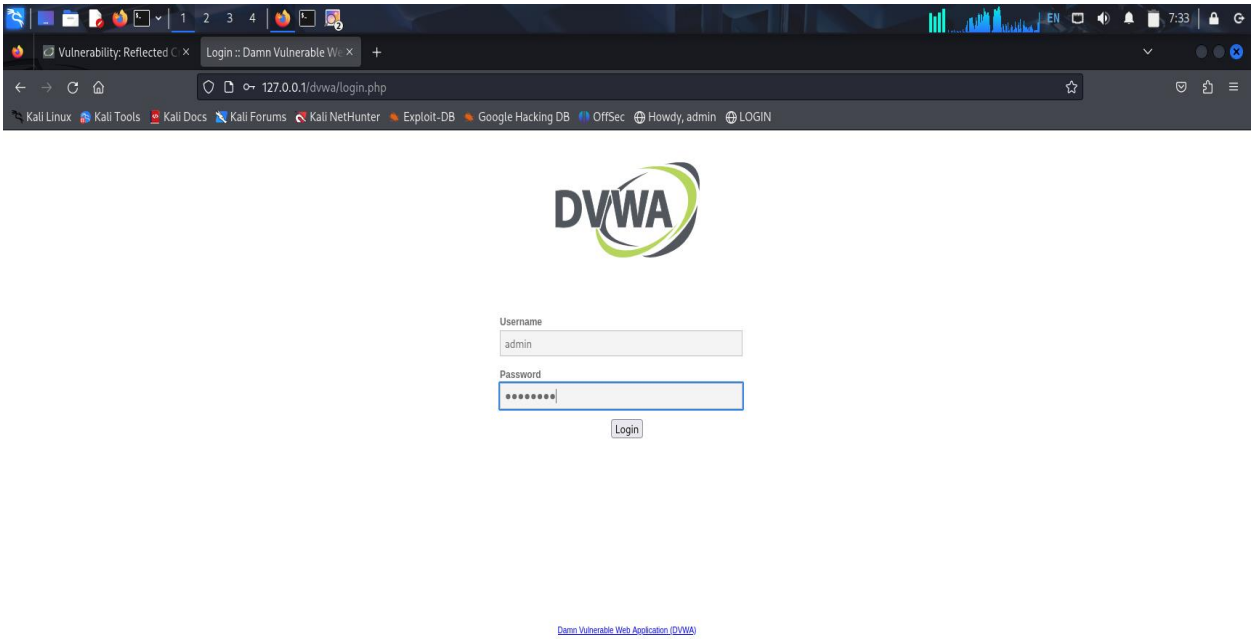
$_DVWA['db_user'] = 'webuser';

$_DVWA['db_password'] = 'strongpassword';

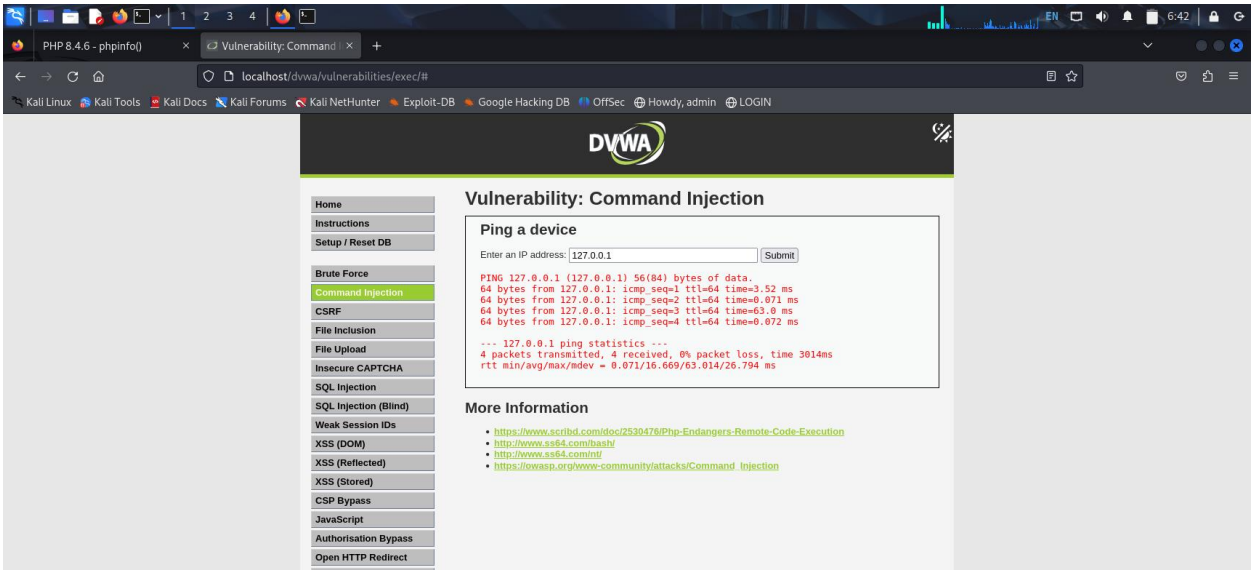
$_DVWA['db_database'] = 'webapp_db';



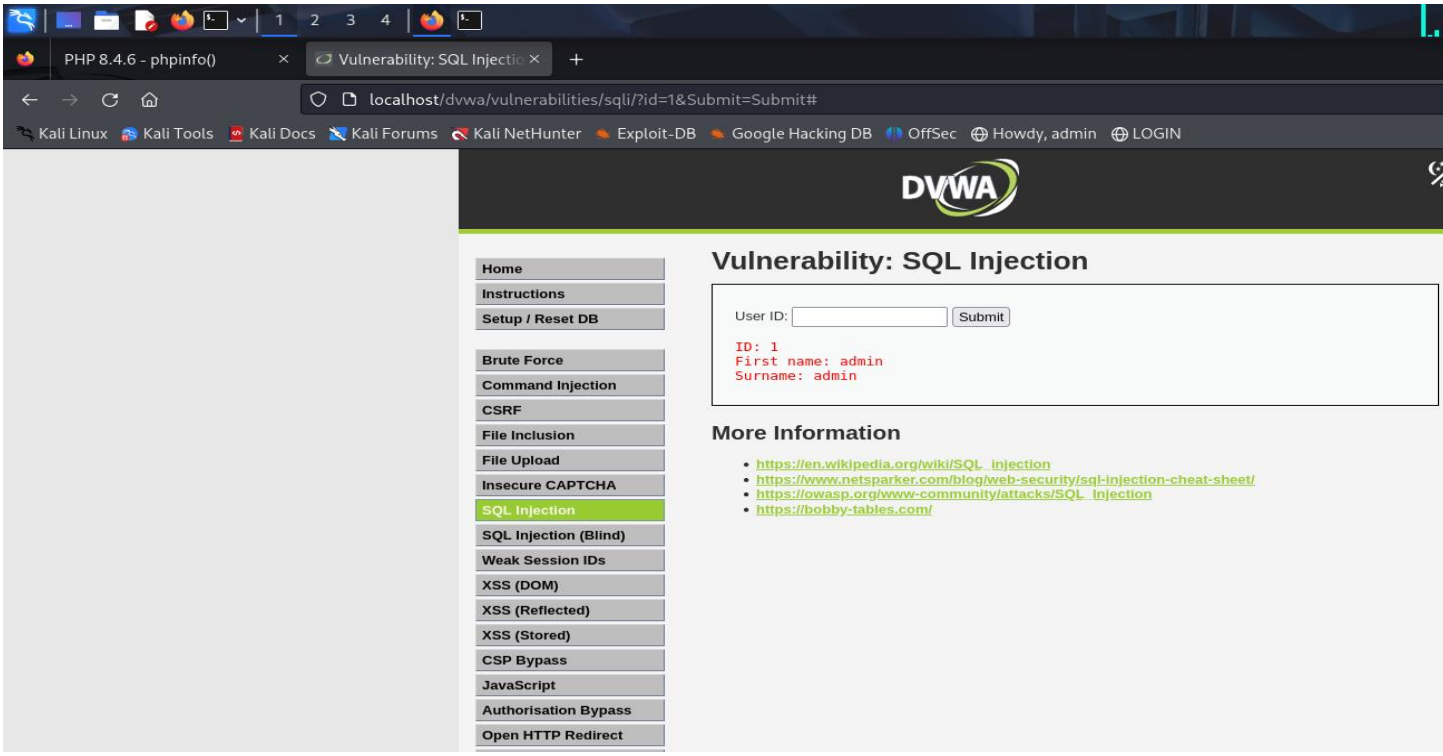
Now open browser type http://localhost/dvwa you can see the below interface.



Login using password and username.

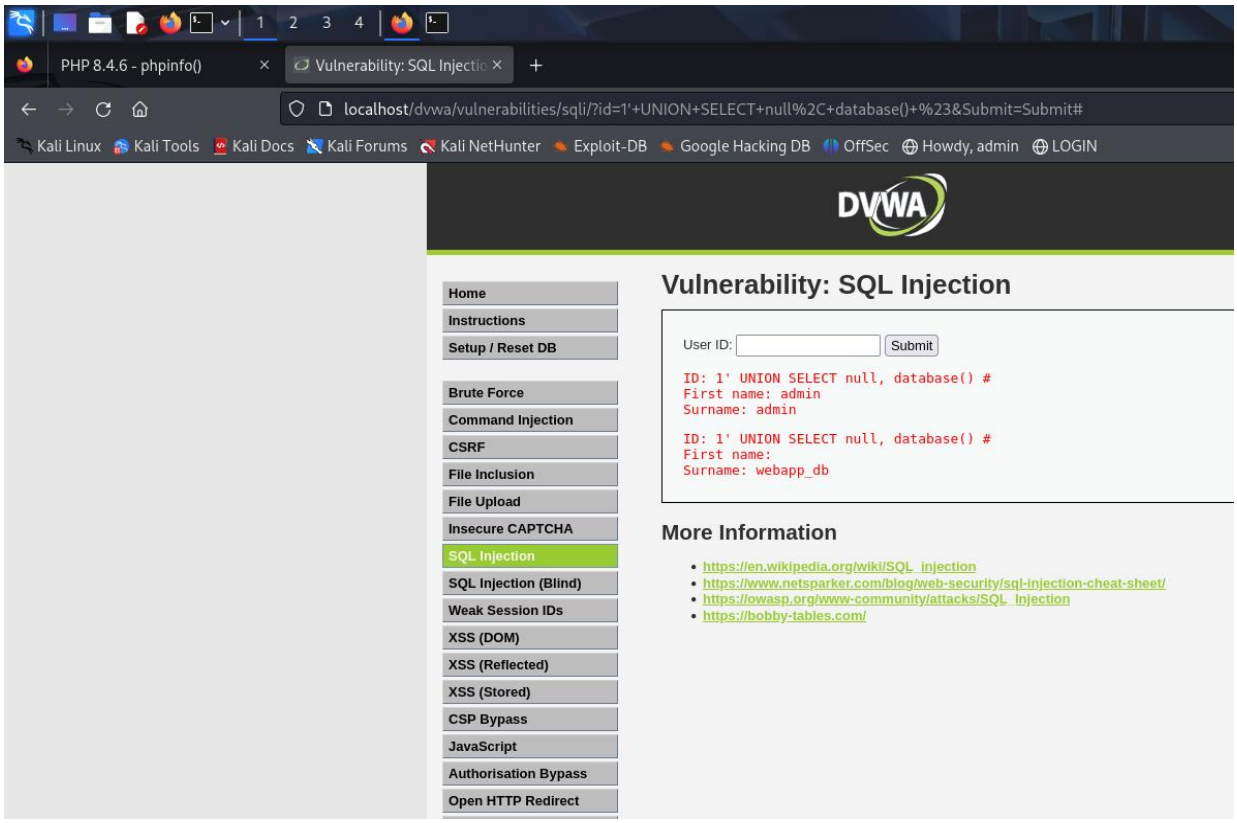


go to command injection and add 127.0.0.1 ip address and submit it then we are ready for sql injection.

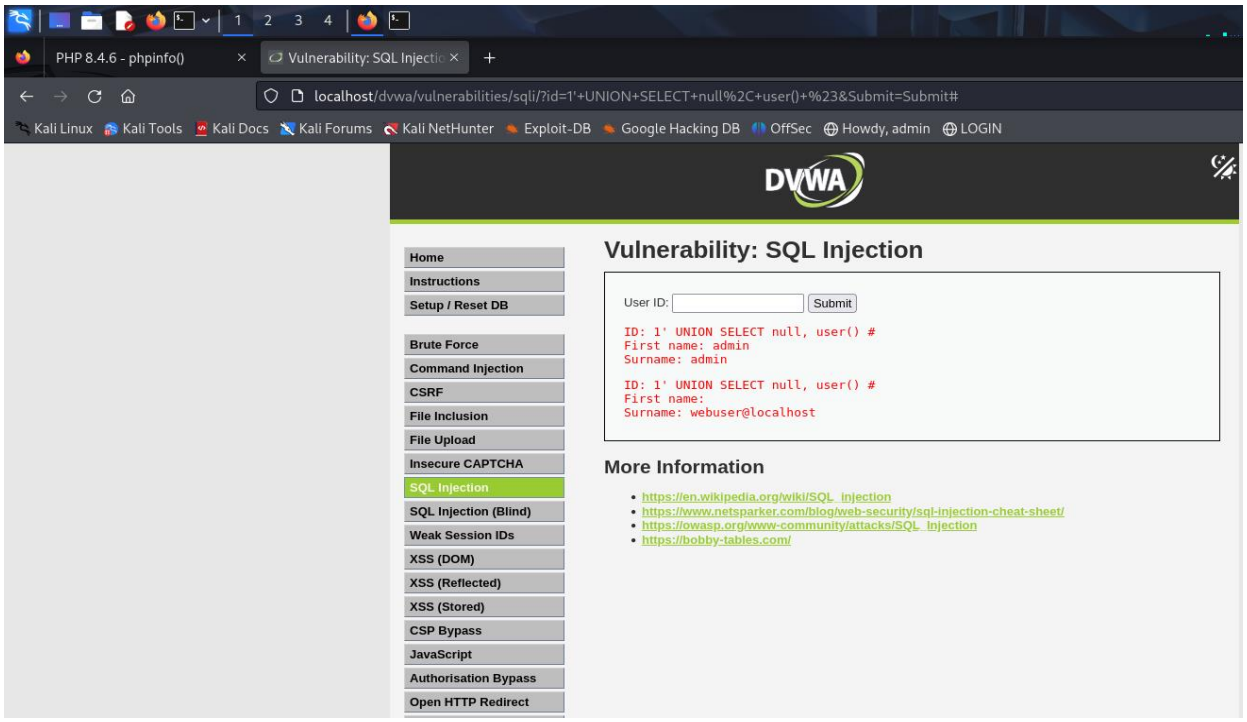


The application is showing data from the database and proves the SQL Injection vulnerability exists.

1' UNION SELECT null, database()

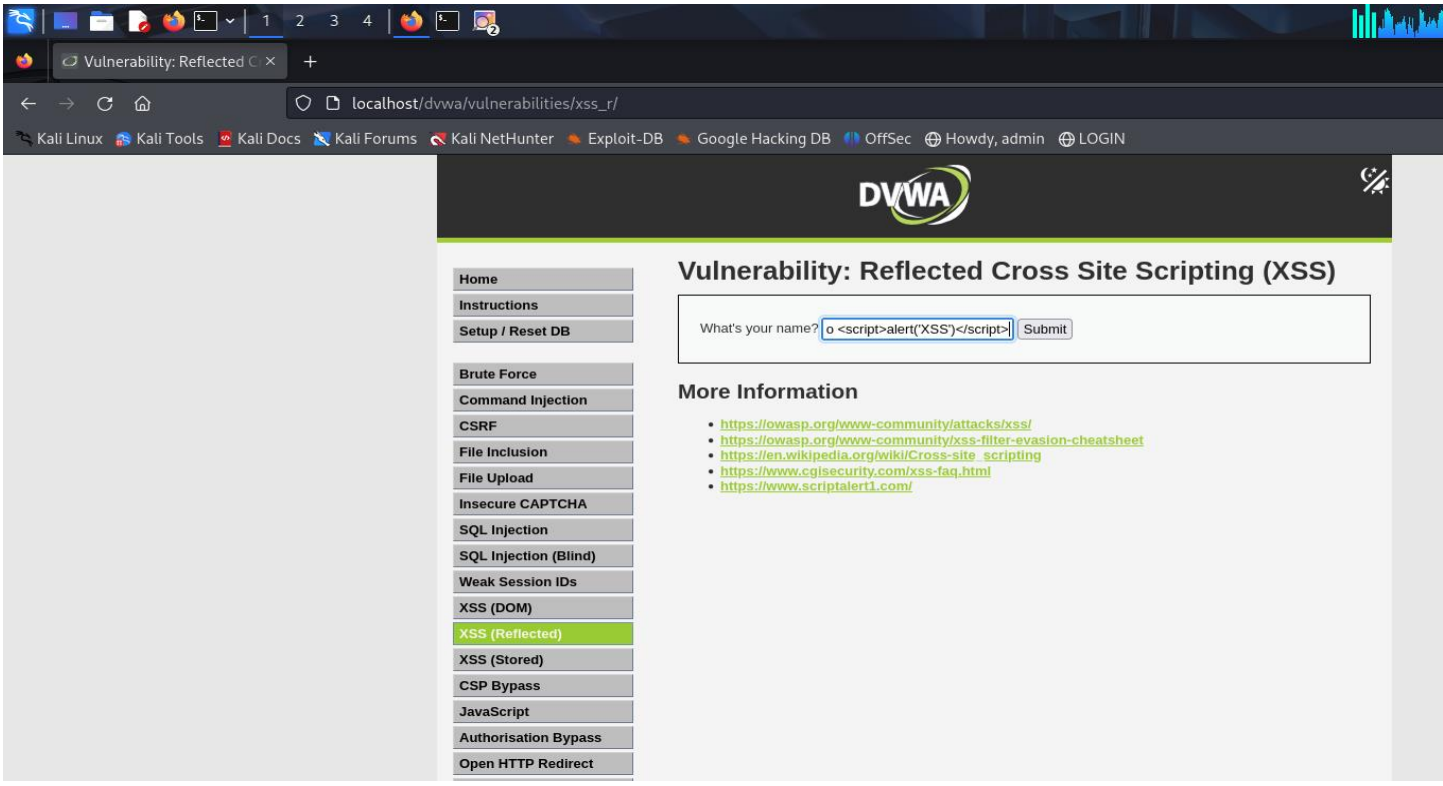


1' UNION SELECT null, version()

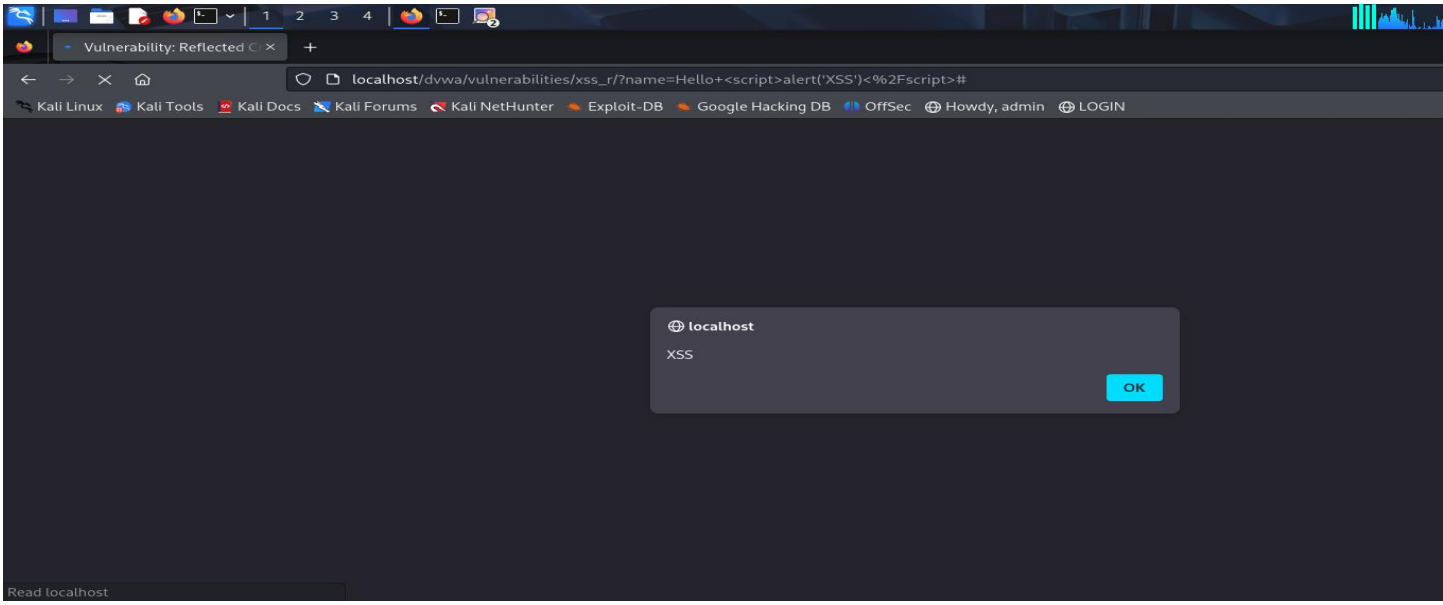


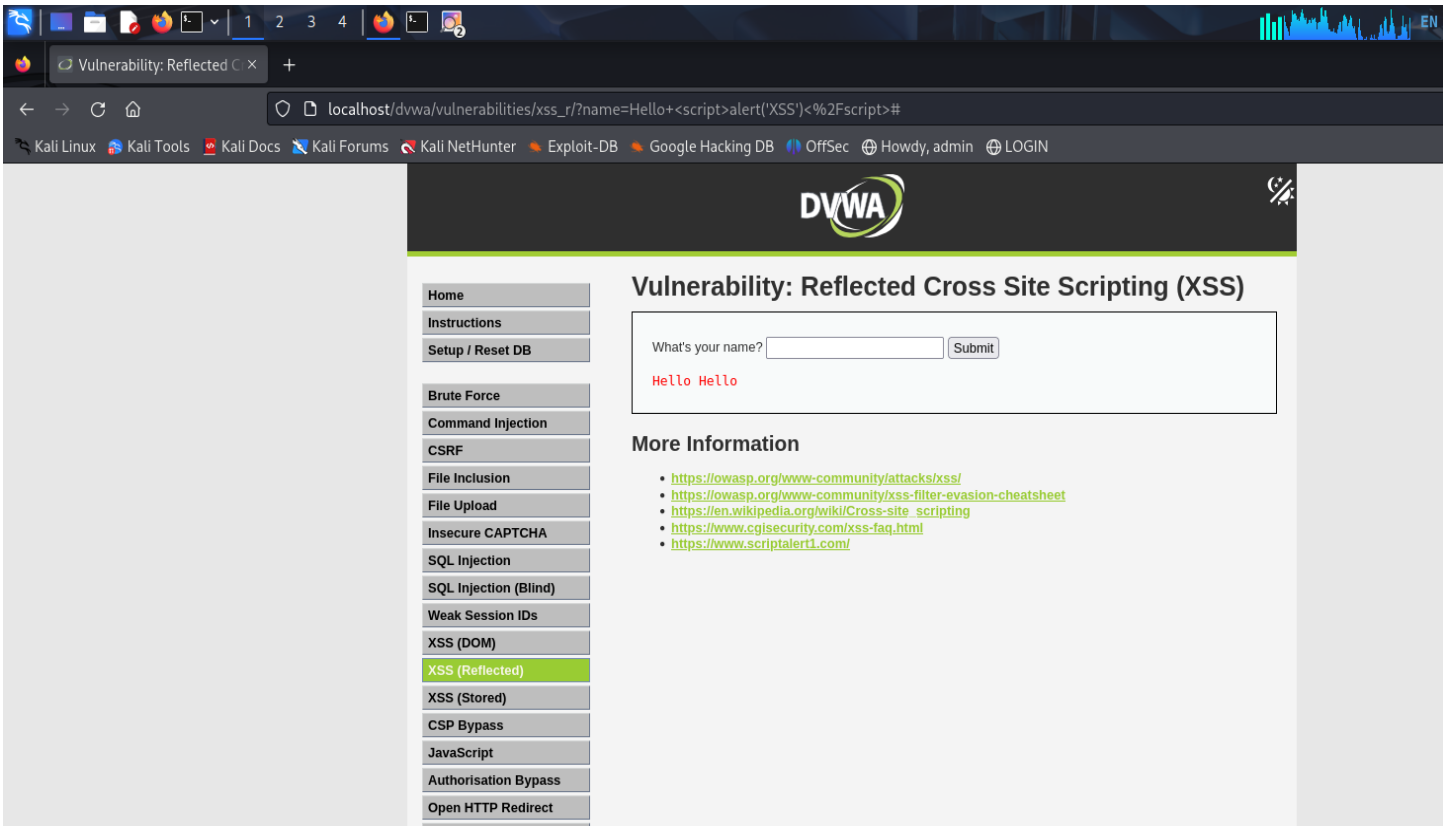
Cross site scripting(xxs)

Go to xxs(Reflected) and execute scripting commands

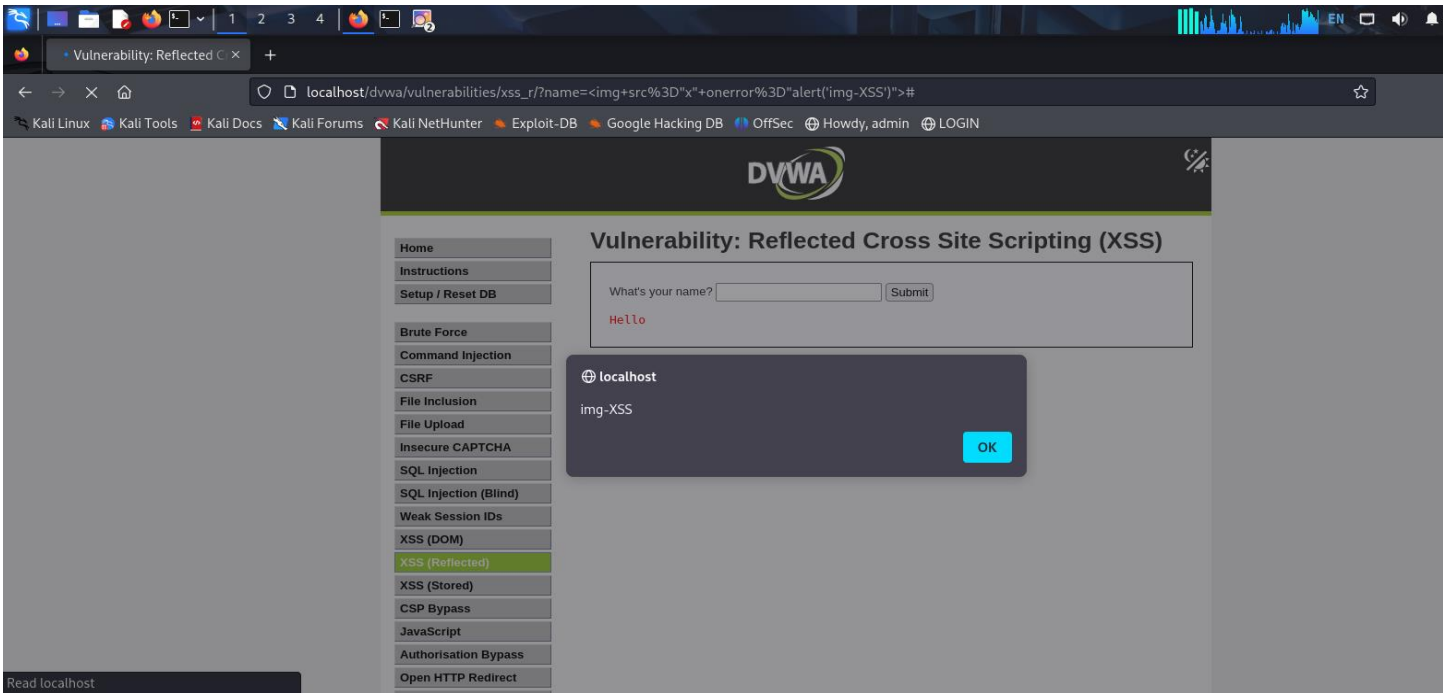


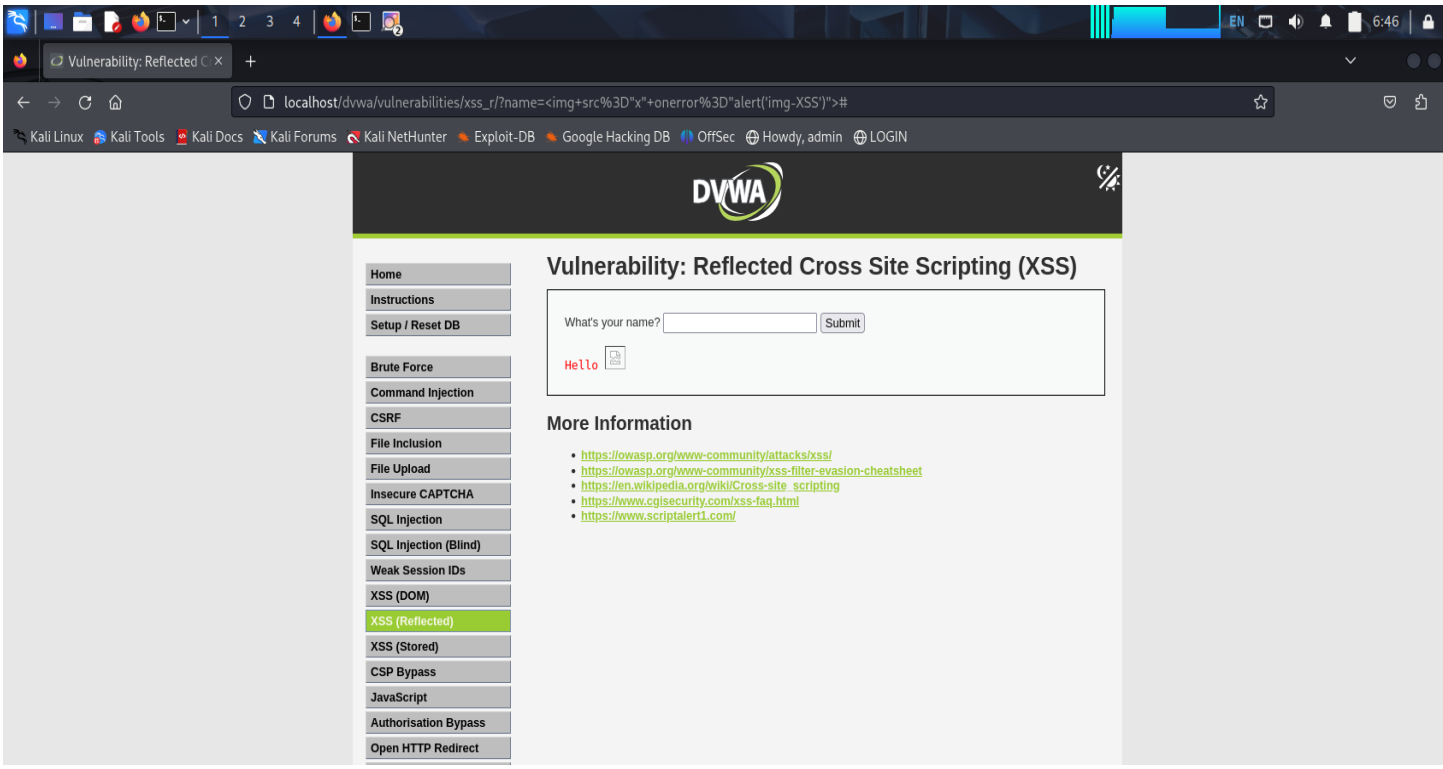
Submit command and we can see a pop up message.



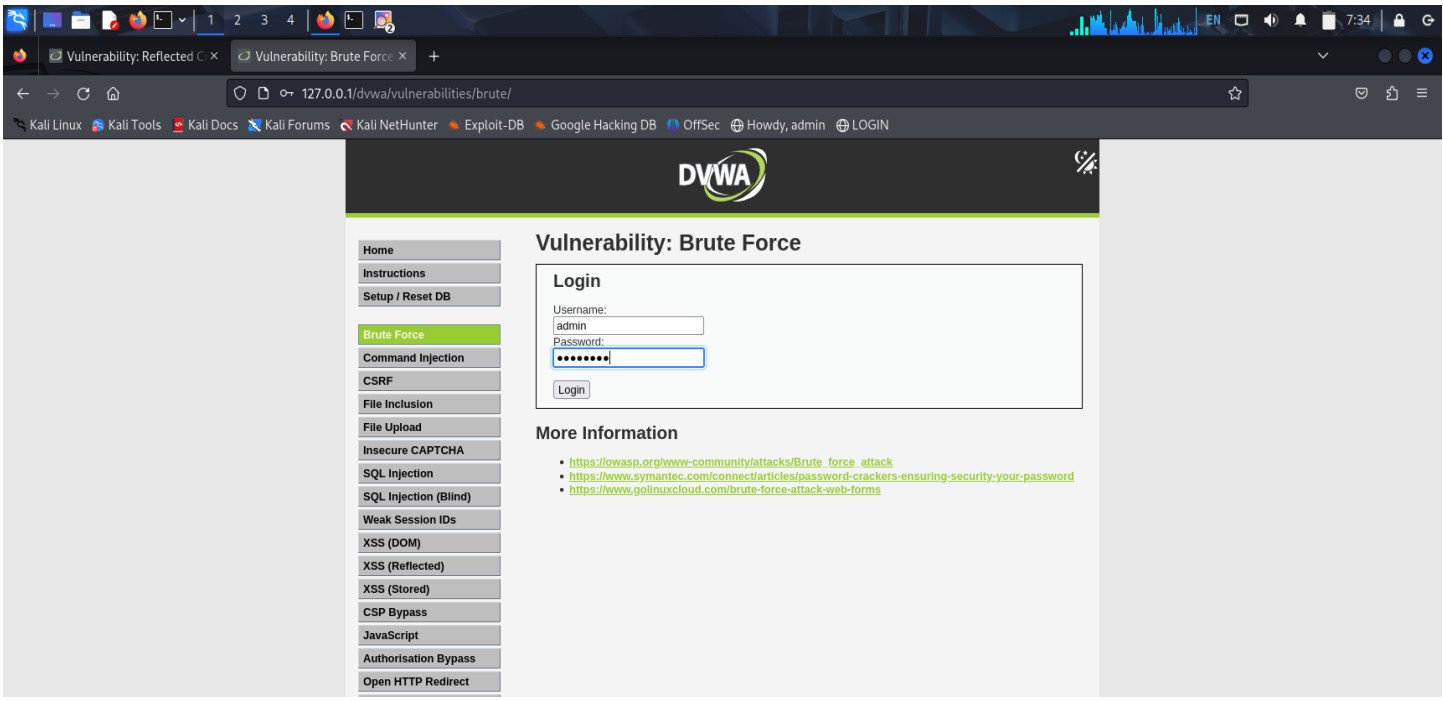


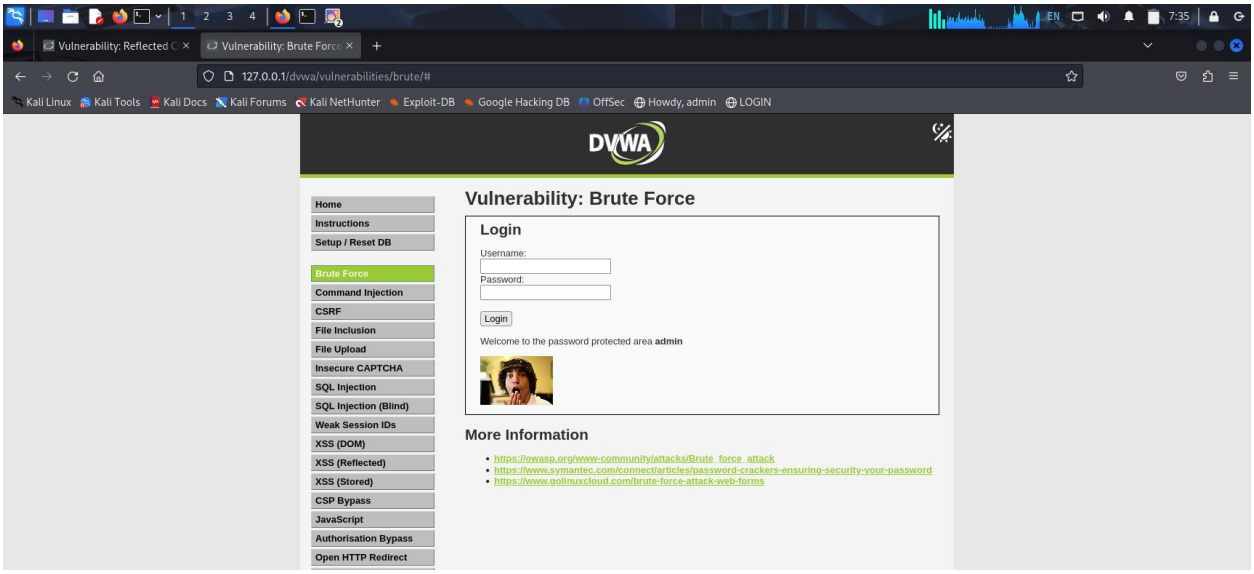
<img src="x" onerror="alert('img-XSS')">





Authentication flaws





to know passwords we can use hydra by using hydra we found 16 passwords and successfully tested vulnerabilities .