

TEH3261/ FTEH3261
ETHICAL HACKING AND SECURITY ASSESSMENT
PROJECT 2 – 10%

Lab Session : 1BV
Team Name : 3AM Hackers
Team Leader : 1191302861 Mayar Abdulmalik M Shenawi
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Group Member 3 : 1191201179 Rian Tiew Ming Sheen
Group Member 4 : 1171103833 Loo Wei Jun

Instructions:

1. Form a group of **3-5** students, remain in the same group for all projects and *Capture-the-Flag* (CTF) – lab tests.
2. Complete **ALL** the questions below by attaching a snapshot of your screen result as evidence.
3. Only **1 copy** to submit by Group Leader.
4. Submit latest by **4 March 2022, 5pm** to the MMLS Assignment Repository.

Netbios enumeration

Target: Windows Server 2016/2019

1. Recall from Lab Activity 1 in Lab 5, propose another Netbios Enumeration tool and try to enumerate Windows Server 2016 or 2019.

2. Snapshot your answer. Analyze the enumeration results. [2%]

```
File Actions Edit View Help

(root@kali)-[/]
# nbtscan -v -r 192.168.8.185
Doing NBT name scan for addresses from 192.168.8.185

NetBIOS Name Table for Host 192.168.8.185:

Incomplete packet, 155 bytes long.
Name           Service      Type
-----
WORKGROUP      <00>         GROUP
WIN-LAASVU42CTQ <00>         UNIQUE
WIN-LAASVU42CTQ <20>         UNIQUE

Adapter address: 00:0c:29:dd:15:80

(root@kali)-[/]
# nbtscan -v -r 192.168.8.185
Doing NBT name scan for addresses from 192.168.8.185

NetBIOS Name Table for Host 192.168.8.185:

Incomplete packet, 155 bytes long.
Name           Service      Type
-----
WORKGROUP      <00>         GROUP
WIN-LAASVU42CTQ <00>         UNIQUE
WIN-LAASVU42CTQ <20>         UNIQUE

Adapter address: 00:0c:29:dd:15:80

(root@kali)-[/]
# smbclient -L 192.168.8.185
Enter WORKGROUP\root's password:

Sharename      Type      Comment
-----
ADMIN$         Disk      Remote Admin
ATtck          Disk
C$             Disk      Default share
IPC$           IPC       Remote IPC
Users          Disk

SMB1 disabled -- no workgroup available

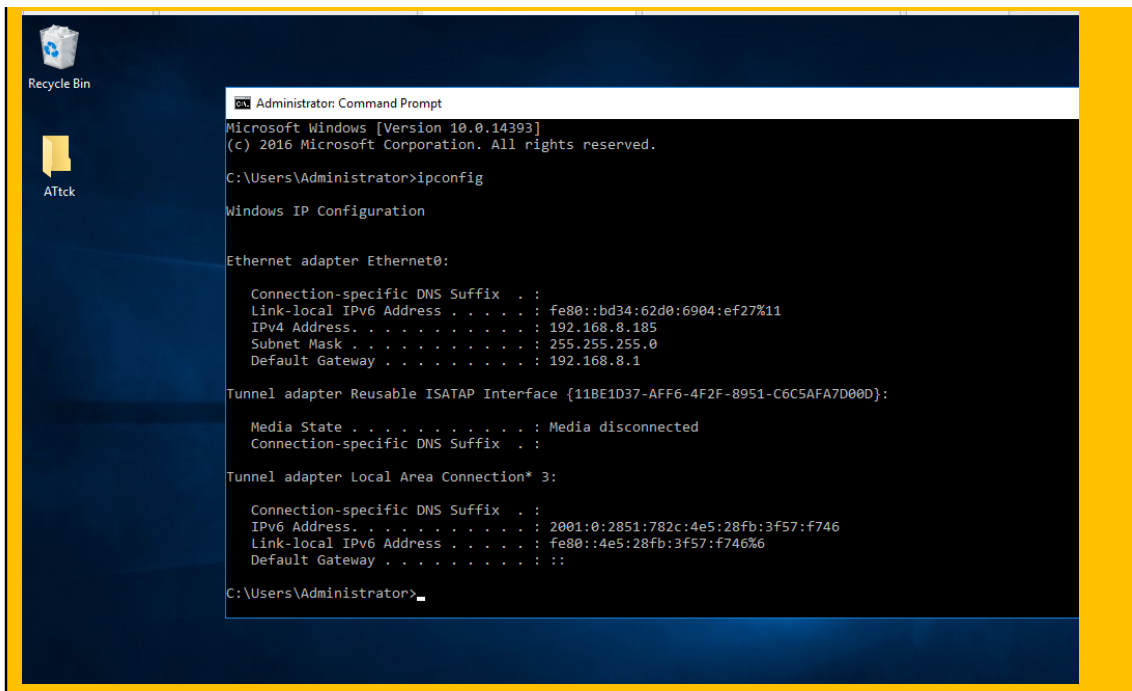
(root@kali)-[/]
# smbclient //192.168.8.185/Users
Enter WORKGROUP\root's password:
Try "help" to get a list of possible commands.
smb: \> ls

.                DR          0 Tue Feb 1 17:03:12 2022
..               DR          0 Tue Feb 1 17:03:12 2022
desktop.ini      AHS         174 Sat Jul 16 09:21:29 2016
Public           DR          0 Tue Feb 1 17:03:18 2022

15600127 blocks of size 4096. 12799448 blocks available
smb: \> cd public
smb: \public\> ls

.                DR          0 Tue Feb 1 17:03:18 2022
..               DR          0 Tue Feb 1 17:03:18 2022
AccountPictures  DHR         0 Tue Feb 1 17:03:18 2022
desktop.ini      AHS         174 Sat Jul 16 09:21:29 2016
Documents        DR          0 Wed Feb 2 03:59:31 2022
Downloads        DR          0 Sat Jul 16 09:23:24 2016
Libraries        DHR         0 Sat Jul 16 09:23:24 2016
Music            DR          0 Sat Jul 16 09:23:24 2016
Pictures         DR          0 Sat Jul 16 09:23:24 2016
Videos           DR          0 Sat Jul 16 09:23:24 2016

15600127 blocks of size 4096. 12799448 blocks available
smb: \public\>
```



Vulnerability scanner

Host: Kali (VM)

Tool: OWASP Zed Attack Proxy (ZAP)

Target: Select 1 MMU Web Server IP (in this lab, please try on mmu.edu.my, mmls2.mmu.edu.my, and any other MMU web server)

1. Look for OWASP Zed Attack Proxy (ZAP) from Applications 3. Web Application Analysis owasp zap / ZAP.

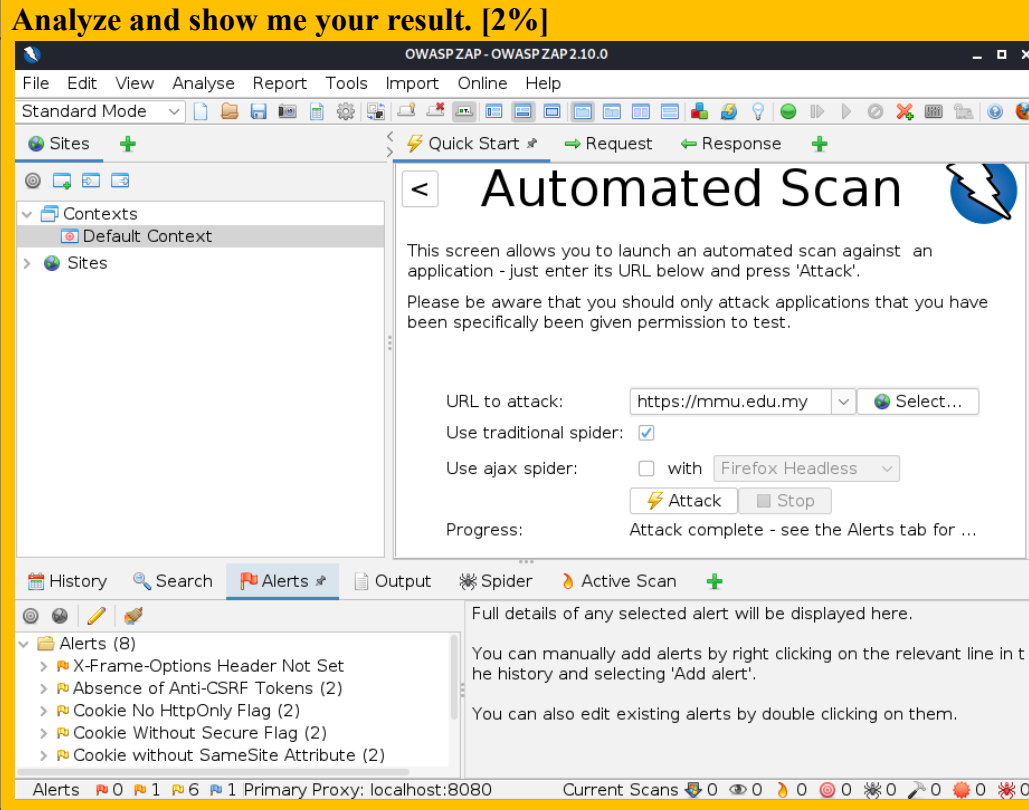


2. Insert the target URL accordingly press ATTACK and observed the results.



3. Any vulnerability found?

Analyze and show me your result. [2%]



Automated Scan

This screen allows you to launch an automated scan against an application - just enter its URL below and press 'Attack'. Please be aware that you should only attack applications that you have been specifically given permission to test.

URL to attack:

Use traditional spider: ☒

Use ajax spider: ☐ with

Progress: Attack complete - see the Alerts tab for ...

Alerts (8)

- > X-Frame-Options Header Not Set
- > Absence of Anti-CSRF Tokens (2)
- > Cookie No HttpOnly Flag (2)
- > Cookie Without Secure Flag (2)
- > Cookie without SameSite Attribute (2)

Full details of any selected alert will be displayed here.

You can manually add alerts by right clicking on the relevant line in the history and selecting 'Add alert'.

You can also edit existing alerts by double clicking on them.

Alerts 0 1 6 1 Primary Proxy: localhost:8080 Current Scans 0 0 0 0 0 0 0 0 0 0

There are multiple alerts, one of them is cookie without a secure flag which means that the cookie can be accessed via unencrypted connections.

Cookie no httponly flag: A cookie has been set without the HttpOnly flag, which means that the cookie can be accessed by JavaScript. If a malicious script can be run on this page then the cookie will be accessible and can be transmitted to another site. If this is a session cookie then session hijacking may be possible.

x-frame options header is not set. : X-Frame-Options header is not included in the HTTP response to protect against 'ClickJacking' attacks

Zap also gives you how to fix the alerts with solutions.

Patch the vulnerable C program

Recall the **hello2.c** from Lab 7.

We need to patch hello2.c code. You can make in a new version, naming as hello3:

```
cp hello2.c hello2_fixed.c
```

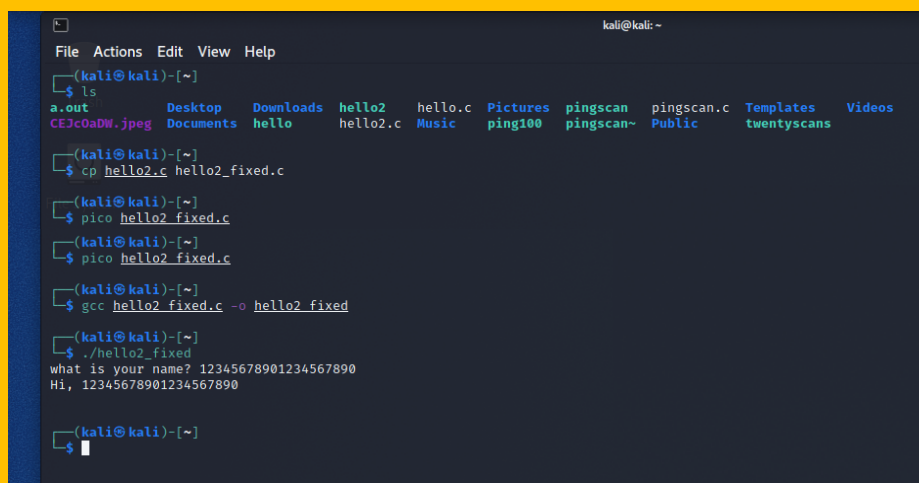
This makes a copy of **hello2.c** named **hello2_fixed.c**.

In the Kali Terminal window, enter this command, then press the Enter key:

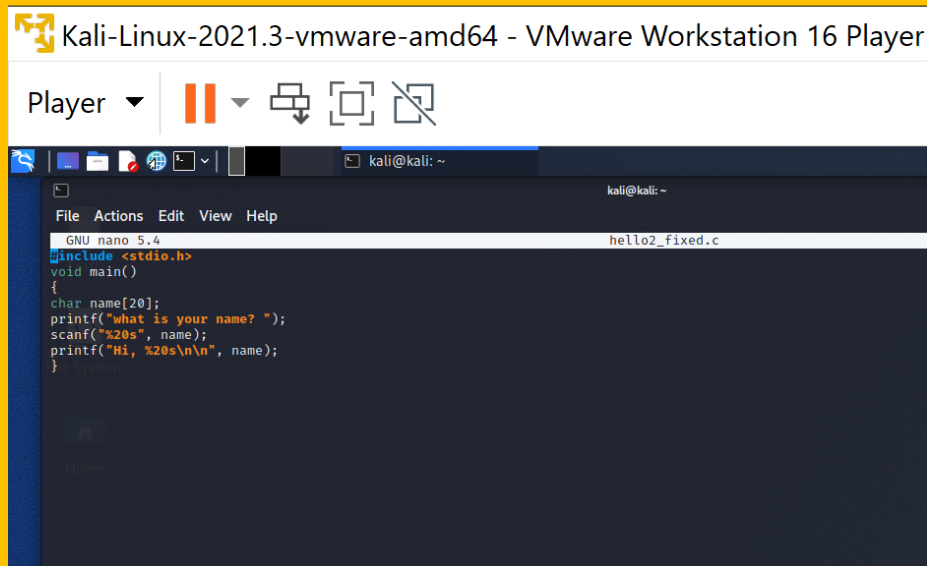
```
pico hello2_fixed.c
```

The pico editor opens.

Patch the code to avoid the buffer overflow. Snapshot your screen to prove that the buffer overflow will not occur again with this patched code. [2%]



```
kali@kali: ~  
File Actions Edit View Help  
~  
(kali@kali)-[~]  
$ ls  
a.out Desktop Downloads hello2 hello2.c Pictures pingscan pingscan.c Templates Videos  
CE3c0aDW.jpeg Documents hello hello2.c Music ping100 pingscan~ pingscan~ Public twentyscans  
~  
(kali@kali)-[~]  
$ cp hello2.c hello2_fixed.c  
~  
(kali@kali)-[~]  
$ pico hello2_fixed.c  
~  
(kali@kali)-[~]  
$ pico hello2_fixed.c  
~  
(kali@kali)-[~]  
$ gcc hello2_fixed.c -o hello2_fixed  
~  
(kali@kali)-[~]  
$ ./hello2_fixed  
what is your name? 12345678901234567890  
Hi, 12345678901234567890  
~  
(kali@kali)-[~]  
$
```



```
Kali-Linux-2021.3-vmware-amd64 - VMware Workstation 16 Player  
Player ▾ || ⏏ ⏏ ⏏  
kali@kali: ~  
File Actions Edit View Help  
GNU nano 5.4 hello2_fixed.c  
#include <stdio.h>  
void main()  
{  
char name[20];  
printf("what is your name? ");  
scanf("%20s", name);  
printf("Hi, %20s\n\n", name);  
}
```

Recalling the hello2.c from Lab 7. First, creating a copy of hello2.c named hello2_fixed.c. So that we can fix the hello2 program to avoid the machine being exposed by hackers. The problem is that it takes the name from typed input and puts it in the name string, but the names longer than 10 characters will cause user-input data to overwrite parts of memory that were not intended to store data, making the

program crash. This is a Buffer Overflow. When users type in the prompt "12345678901234567890", It will show an error message. *** stack smashing detected *** OR *** Segmentation fault ***

Therefore, to fix this buffer overflow, in the pico editor, the string size limit needs to be changed from "%s" to "%20s". This is because the name string has a size limit; it only has enough room for 10 characters only.

Familiarize with *Capture-the-Flag (CTF)*

Platform: Hack This Site (<https://hackthissite.org/>)

1. Be warned: in this project, you will be learning real criminal techniques from real criminals. Do not reveal your real name or address or trust these people.
2. Open a browser and go to **hackthissite.org**
3. In the upper left, click on the word **register**.
4. Fill out the form to create an account. Do **NOT** give these people your real name or any correct information, not even a real email address (you may create another new email, mainly for this game).

Support HackThisSite
ADVERTISE WITH US

I take my desires for reality because I believe in the reality of my desires.

Training the hacker underground

HackThisSite.org is a free, safe and legal training ground for hackers to test and expand their ethical hacking skills with challenges, CTFs, and more. Active since 2003, we are more than just another hacker wargames site. We are a living, breathing community devoted to learning and sharing ethical hacking knowledge, technical hobbies, programming expertise, with many active projects in development. Join our IRC, Discord, and our forums where users can discuss hacking, network security, and more. Tune in to the hacker underground and get involved with the project!

First timers should read the [HTS Project Guide](#) and [create an account](#) to get started. All users are also required to read and adhere to our [Terms and Conditions](#). Get involved on our [IRC server](#) ([irc.hackthissite.org](#) SSL port 7000), [Discord](#), and our [web forums](#).

STAFF BLOGS / SHORT NEWS:
[blog](#) Status Pages 2.0 - N...
[news](#) Application 2
[blog](#) Github for Status Pa...
[blog](#) Internetwache CTF 20...

LATEST ARTICLES:
How are websites defaced?
What is OSINT and what are t...
How to stay anonymous &a...
Realistic mission 1 tutorial
Cryptanalysis

HackThisSite on GitHub:

Repositories	20
Forks	102
Watchers	312
Stargazers	312
Contributors	15
Commits This Week	0

CONTRIBUTE:
» [IRC / Discord](#) (745 online, 0 voice) - Chat
» [Forums](#) - Discussion
» [GitHub](#) - Open Source

LAST CHALLENGE COMPLETED:
» [Basic 2](#) completed 1 minute 33 seconds ago by [mrchurch](#)

LATEST FORUM POSTS:
(02/24/22 7:35) Re: Which is the Right VPN for Australia?
(02/24/22 7:28) streaming services
(01/08/22 4:47) Re: [#coffeshOp](#)
(12/22/21 12:31) Re: Destination Wedding Planner in Jaipur
(11/30/21 7:31) Cloning APP&Crackin Passwords

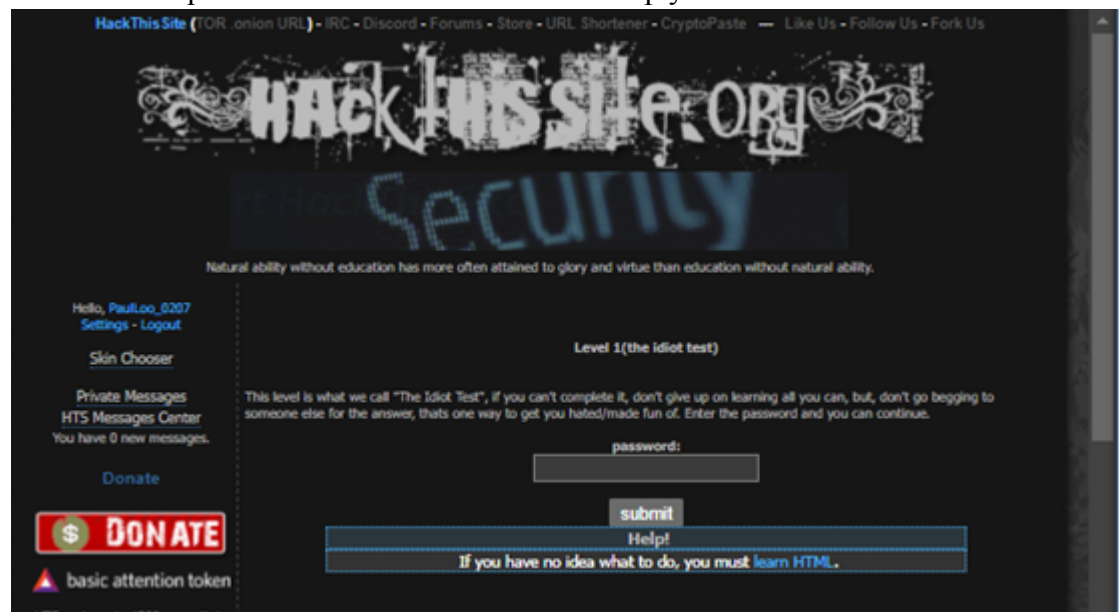
LATEST IRC LINES: (WEB CHAT)
([#hackthissite](#)) <Discord> <Wuelle> np, I wasnt exactly helpful though ;)
([#hackthissite](#)) <weekend> @Wuelle, remind me this weekend to start a revival ...
([#hackthissite](#)) <weekend> I am saying it now, so I will be peer pressured to ...
([#hackthissite](#)) <Discord> <Wuelle> will try to remember it ;)
([#hackthissite](#)) <rik> hi

Latest site news:

5. After creating your account, log in. Then, on the left tab of the main page, in the **challenges** section, click "**Basic Missions**"



6. There is a Help! Link at the bottom which can help you.

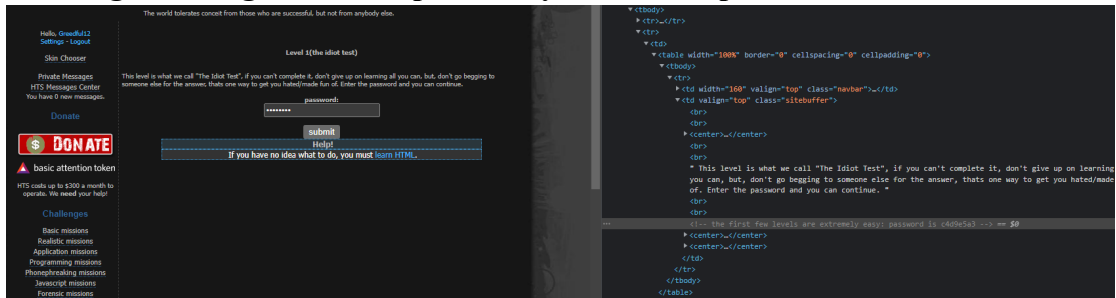


7. The Web hacking challenges includes **eleven** Basic Web Challenges. Solve at least **eight (8)** puzzles. You get **0.5 point** per level completed.

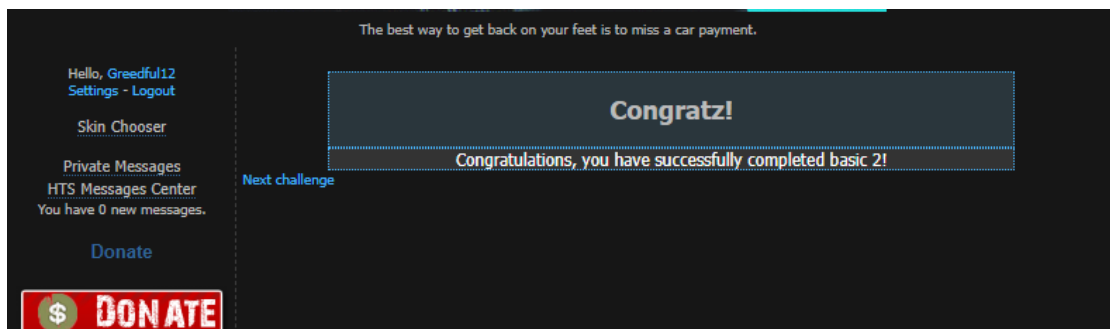
Show your steps on how you solved the challenge. [4%]

Notes: your account name must be shown when you snapshot your answer – to prove that you attempted the challenges/ puzzles by using your account.

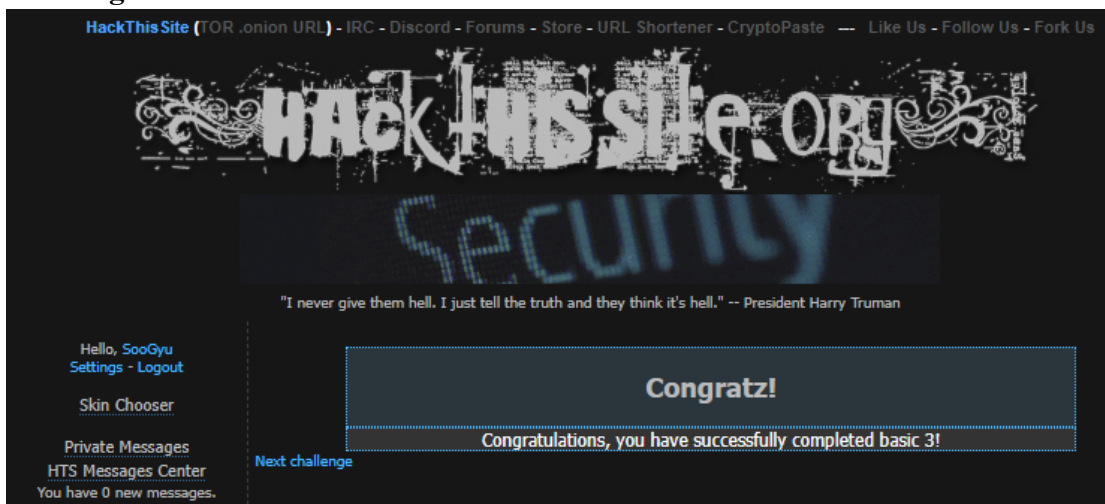
Challenge 1 > Right click inspect and you find the password which is c4d9e5a3



Challenge 2 > Since he neglected to upload the file, you can login with an empty password

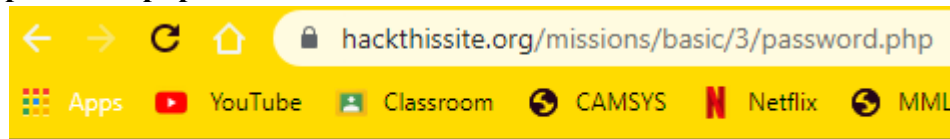


Challenge 3 >



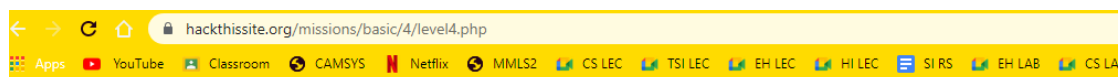
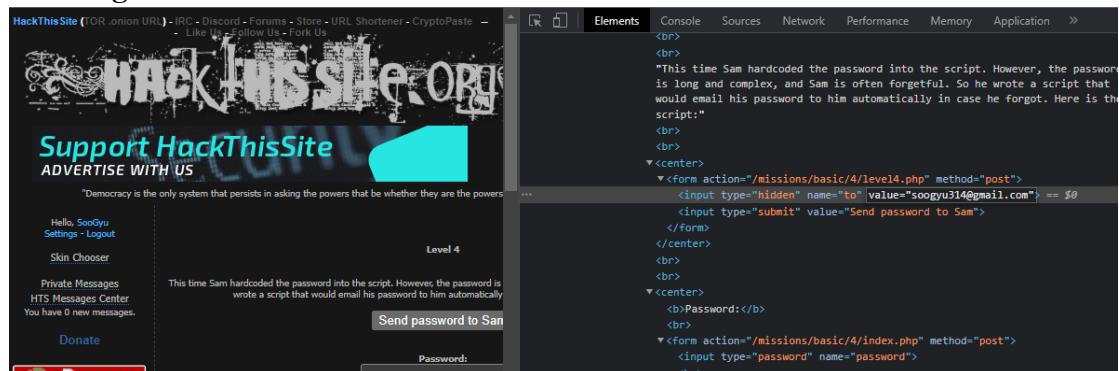
Solution 3 >

password.php added at the end of the url



36511067

Challenge 4 >

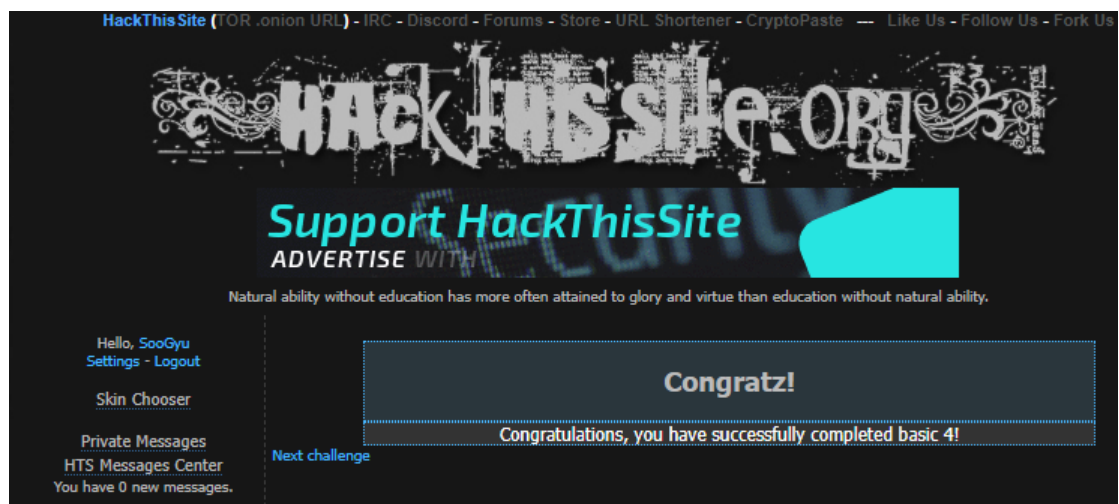
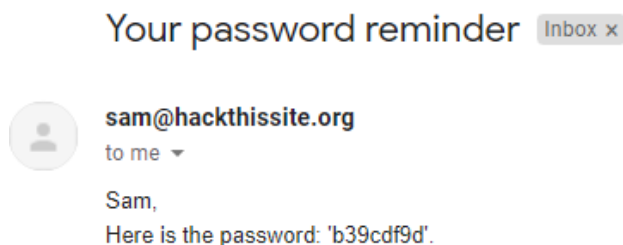


Password reminder successfully sent to soogyu314@gmail.com

(Note: If this is not the email address on your HackThisSite profile, no email will actually be sent.)

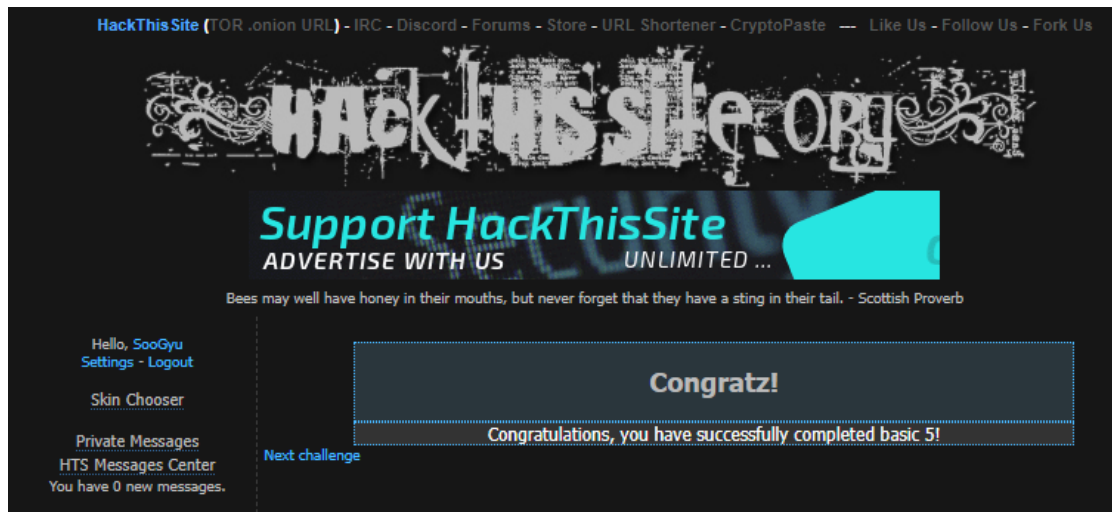
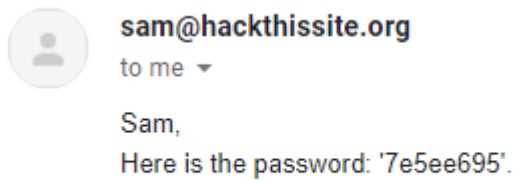
Solution 4 >

personal email is edited into the source code for the email to be sent

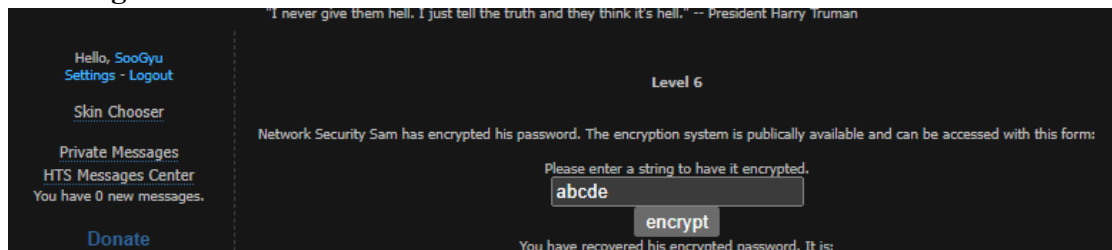


Prepared by: SY Ooi

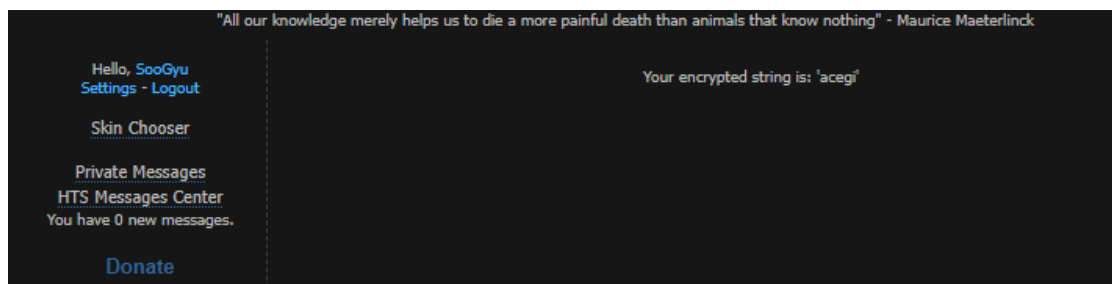
Challenge 5 is equivalent to Challenge 4



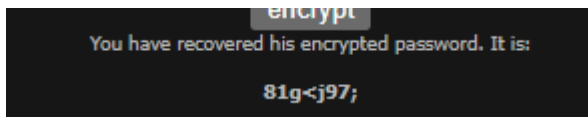
Challenge 6 >



Solution 6 > Assuming the password we have is “abcde”, and we click on the encrypt button

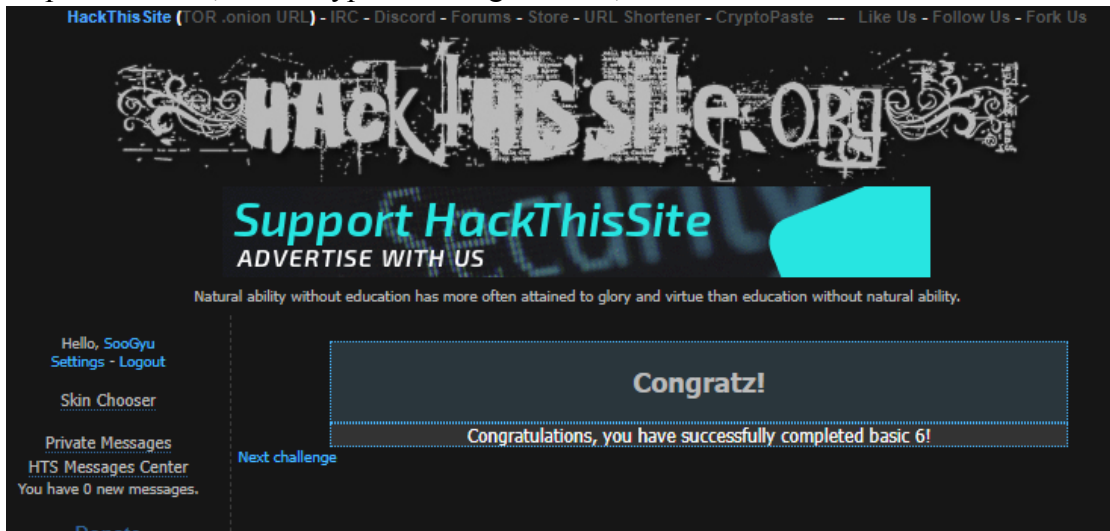


As we can see that there is a pattern of increment in string value (ASCII) where the string value is increased in a pattern of string position. For example, ‘a’ is in the position of 0 in computer language. Therefore, ‘a’ + 0 in (ASCII) is equalled to ‘a’, whereas ‘b’ + (position of 1) = ‘c’, thus, so forth. That is how we obtained the encrypted string equal to ‘acegi’.

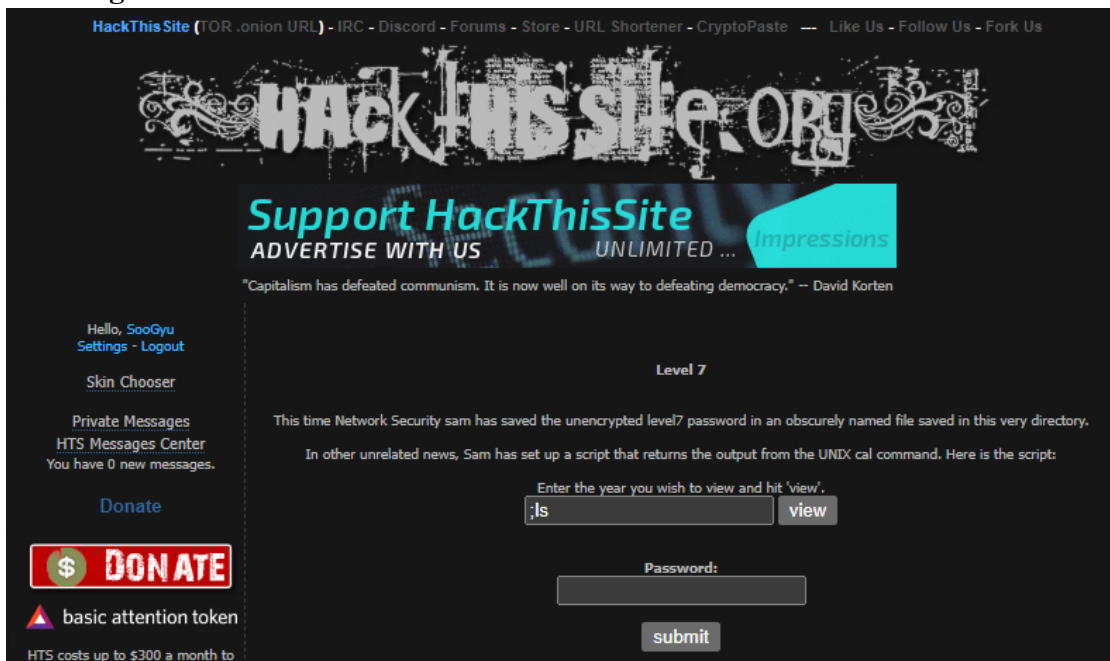


Since we have this pattern of encryption, we can decrypt the encrypted password as simply as subtracting the position value. For example, 8 is at the position of zero, so we subtract 8 with 0 which equals to 8; 1 is at position 1 so $1-1 = 0$; 'g' is at the position of 2 so 'g' reverse sequence by 2 is 'e'; '<' requires reference of ASCII table, (<https://www.asciitable.com/>) we may see that '<' has the decimal value of 60. By subtracting $60 - 3$, we get value 57, which refers to '9' in the ASCII table.

As per reference, the decrypted message will be, **80e9f414**



Challenge 7 >



```

<form action="/missions/basic/7/cal.pl" method="post">
  <input type="text" name="cal">
  <input type="submit" value="view">
</form>
<br>
<br>

```

Since the form did not specify the input type, any special characters can be input even command characters. Thus, we can insert commands to retrieve and trigger information from the site. This is a best example of an injection attack.

Since there is a hint that the system is using Unix command, therefore we can input ‘;ls’ to list the files within this site.

```

      March 2022
Mon Tue Wed Thu Fri Sat Sun
      1  2  3  4  5  6
  7  8  9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30 31

index.php
level7.php
cal.pl
.
..
k1kh31b1n55h.php

```

As shown, there is an obscurely named file at the bottom section.

← → ↻ 🏠 hackthissite.org/missions/basic/7/k1kh31b1n55h.php

📱 Apps 📺 YouTube 👤 Classroom 🔄 CAMSYS 📺 Netflix 🔄 MMLS2

c372077d

After inserting the weird php into the url, the password is shown.

In all large corporations, there is a pervasive fear that someone, somewhere is having fun with a computer on company time. Networks help alleviate that fear.

Hello, SooGyu
Settings - Logout

Skin Chooser

Private Messages
HTS Messages Center
You have 0 new messages.

Donate

Congratz!

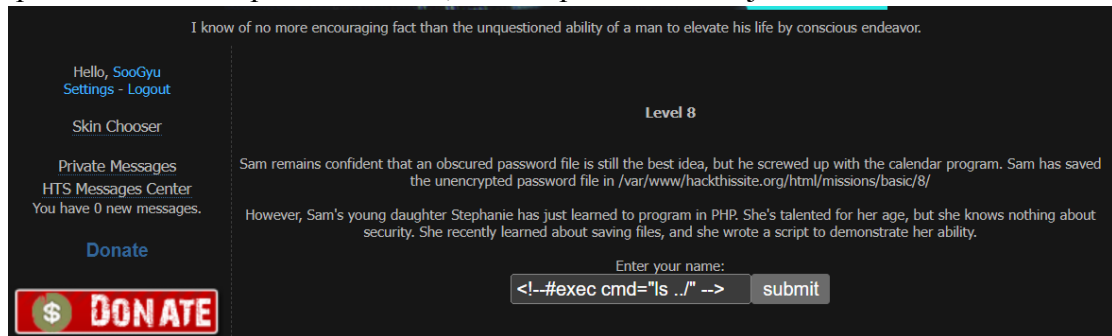
Congratulations, you have successfully completed basic 7!

Next challenge

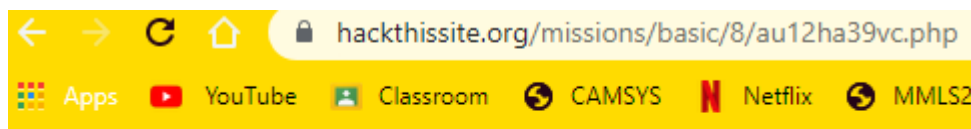
Challenge 8 >

```
<form action="/missions/basic/8/level8.php" method="post">
  <input type="text" name="name">
  <input type="submit" value="submit">
```

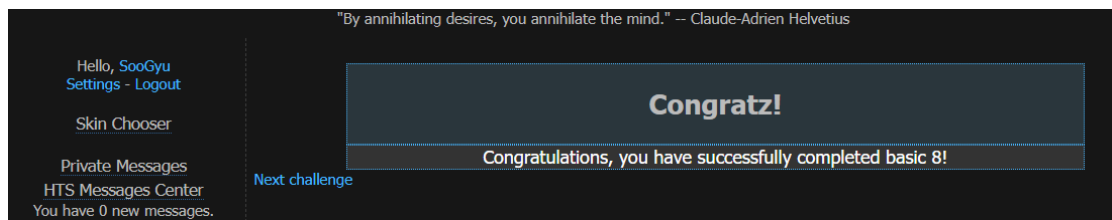
Based on this screenshot of codes, we can see that the developer hasn't restricted special character inputs. Therefore, we can perform SSI injection attack.



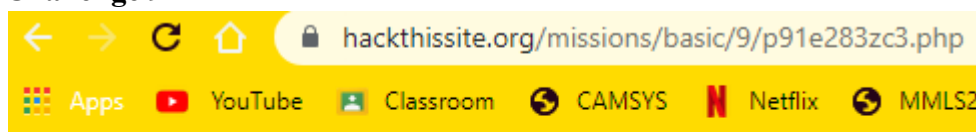
Hi, au12ha39vc.php index.php level8.php tmp! Your name contains 39 characters.



2f3e388d

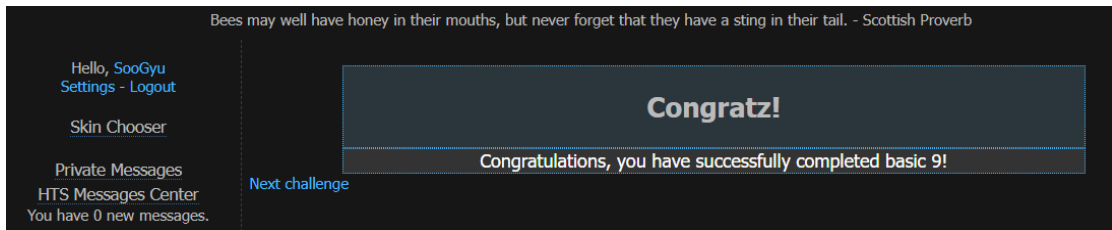


Challenge 9 >



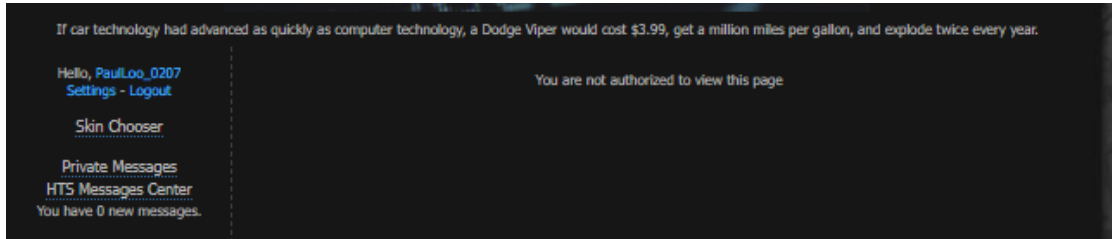
1e78b9bc

In this mission, there is no input box in the site, therefore, we went back to mission 8's input box to paste the command "<!--#exec cmd='ls ../9' -->".
../9 stands for website name/ sub file/ subfile/9

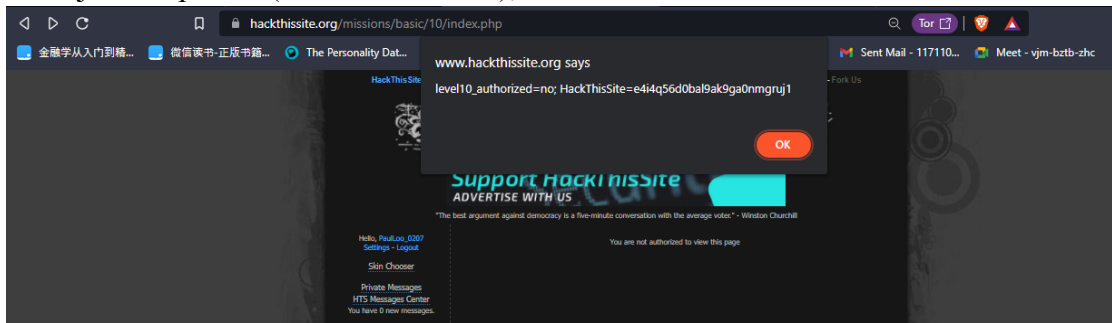


Challenge 10 >

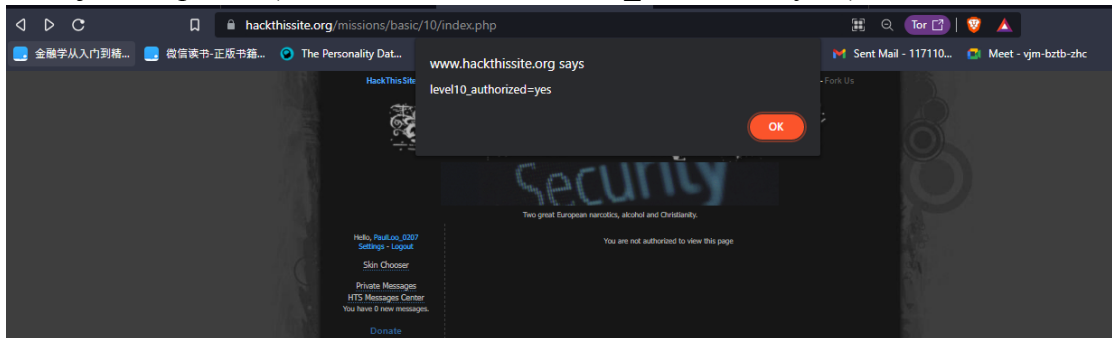
Enter password



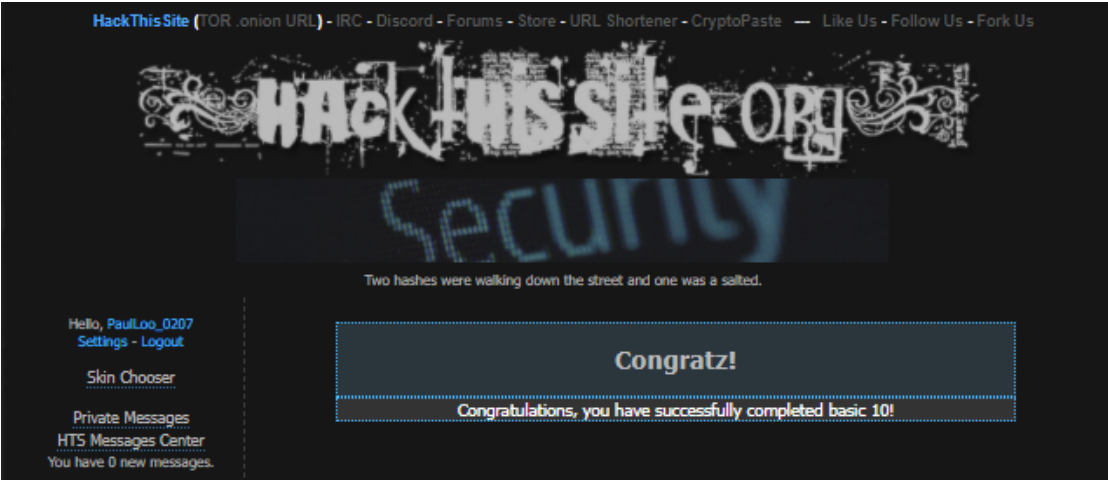
Enter javascript:alert(document.cookie);



Enter javascript:alert(document.cookie="level10_authorized=yes");

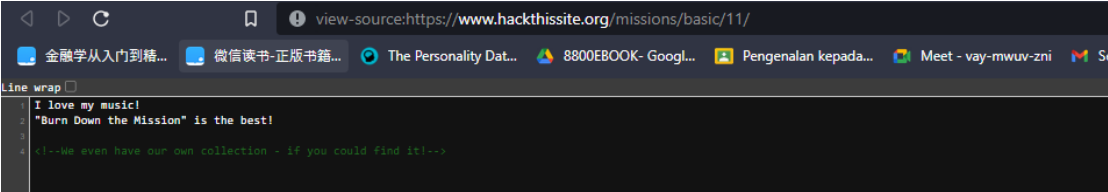


Reload and the it submitted successfully

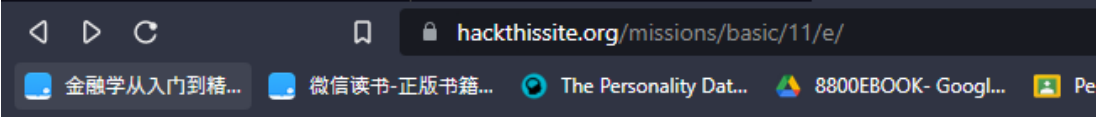


Challenge 11 >

View page source



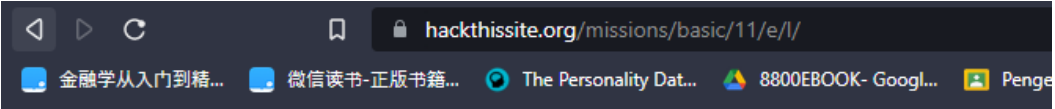
put e in the end



Index of /missions/basic/11/e

Name	Last modified	Size	Description
Parent Directory		-	
l/	2013-12-30 05:28	-	

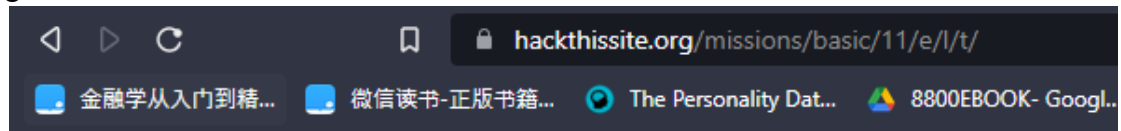
go with l



Index of /missions/basic/11/e/l

Name	Last modified	Size	Description
Parent Directory		-	
t/	2013-12-30 05:28	-	

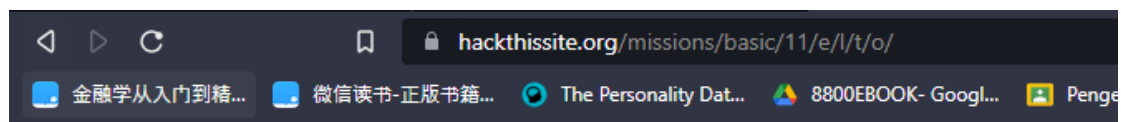
go with t



Index of /missions/basic/11/e/l/t

Name	Last modified	Size Description
Parent Directory	-	-
o/	2013-12-30 05:28	-

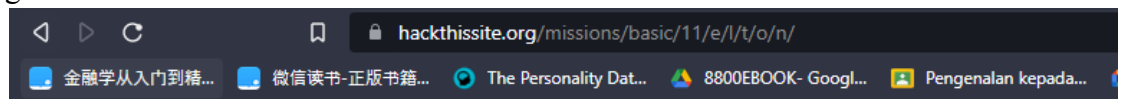
go with o



Index of /missions/basic/11/e/l/t/o

Name	Last modified	Size Description
Parent Directory	-	-
n/	2019-03-01 20:34	-

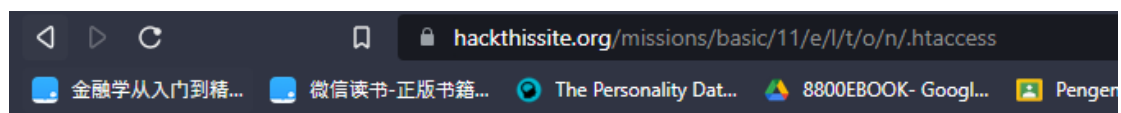
go with n



Index of /missions/basic/11/e/l/t/o/n

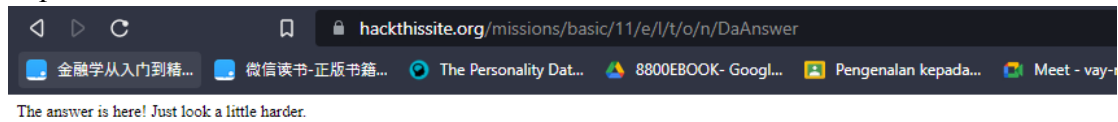
Name	Last modified	Size Description
Parent Directory	-	-

Put .htaccess in the end

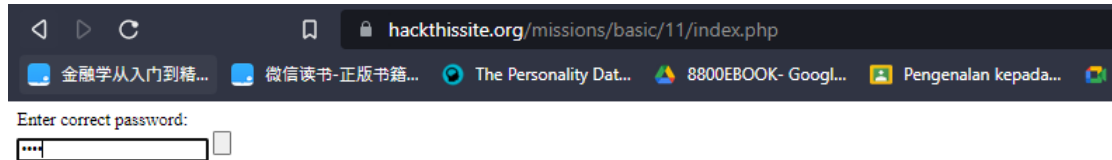


```
IndexIgnore DaAnswer.* .htaccess
<Files .htaccess>
require all granted
</Files>
```

Replace .htaccess with DaAnswer



The password is “here”



All the basic exercises are completed

