

Lab 05 – Scripting

Name: Christian Fernandez

Course/Section: IS-1003-ON3

Date: 10/28/2025

INTRODUCTION

In this lab we will create a script that automates a set of commands and a main driver so that we are able to execute the commands again in the future without having to type everything out again.

BREAKPOINT 1

```
fernandez@kali: ~/Documents
Session Actions Edit View Help
└──(fernandez㉿kali)-[~]
    └─$ cd documents
        cd: no such file or directory: documents

└──(fernandez㉿kali)-[~]
    └─$ cd Documents
        └──(fernandez㉿kali)-[~/Documents]
            └─$ mkdir lab-05

└──(fernandez㉿kali)-[~/Documents]
    └─$ ls
        lab-05

└──(fernandez㉿kali)-[~/Documents]
    └─$ echo $RANDOM
        28521

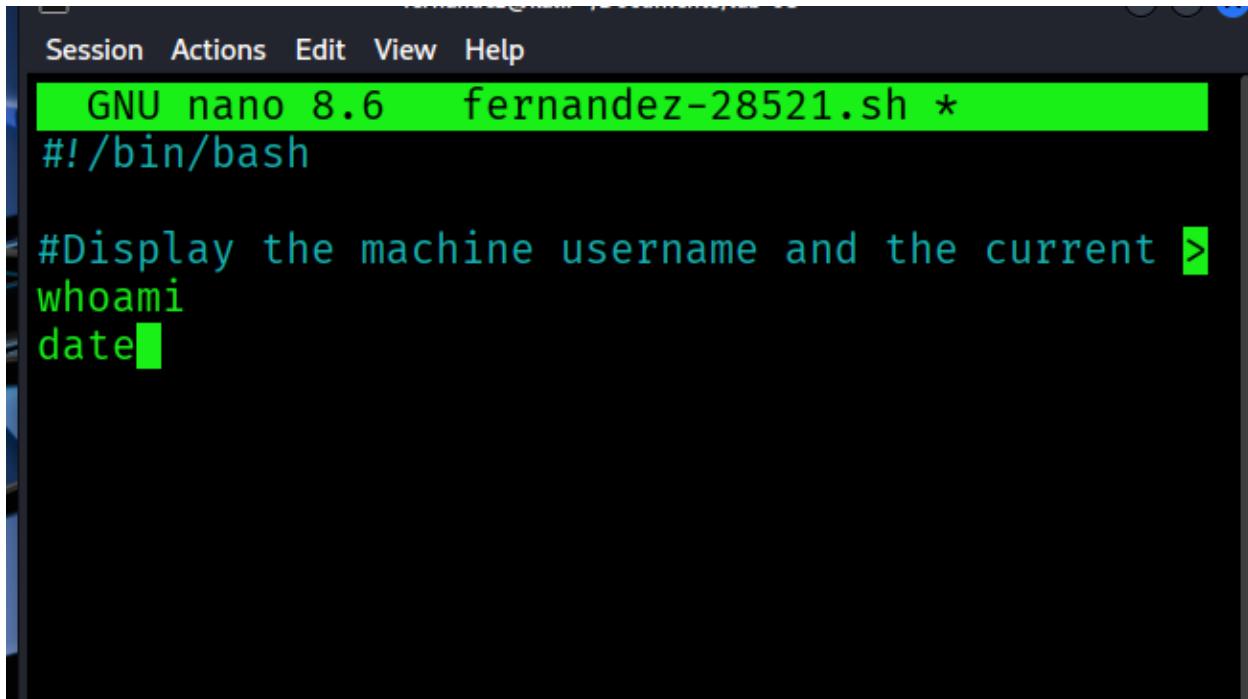
└──(fernandez㉿kali)-[~/Documents]
    └─$ touch fernandez-28521.sh

└──(fernandez㉿kali)-[~/Documents]
    └─$ ls -l
        total 4
        -rw-rw-r-- 1 fernandez fernandez 0 Oct 28 16
        :43 fernandez-28521.sh
        drwxrwxr-x 2 fernandez fernandez 4096 Oct 28 16
        :38 lab-05

└──(fernandez㉿kali)-[~/Documents]
    └─$ █
```

Figure 1: Dir and random number file created 16:50 10/28/2025

For this part of the Lab I created a directory call “lab-05” and a file using the command `echo $RANDOM` to create a random number and then used the number to create a file inside the new directory.



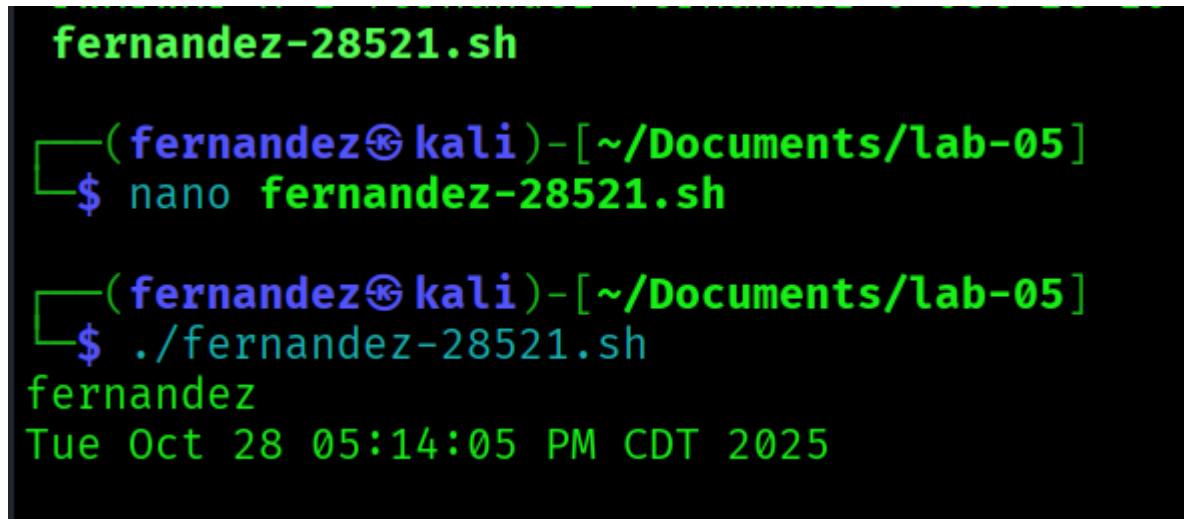
The screenshot shows a terminal window with a dark background and light-colored text. At the top, there's a menu bar with "Session", "Actions", "Edit", "View", and "Help". Below the menu, the title bar says "GNU nano 8.6 fernandez-28521.sh *". The main area of the terminal contains the following text:

```
#!/bin/bash

#Display the machine username and the current time
whoami
date
```

Figure 2: nano file creation 17:11 10/28/2025

In the above screen shot I opened my file I created with the nano command and added the text above.



The screenshot shows a terminal window with a dark background and light-colored text. It displays the following session:

```
fernandez-28521.sh

(fernandez㉿kali)-[~/Documents/lab-05]
$ nano fernandez-28521.sh

(fernandez㉿kali)-[~/Documents/lab-05]
$ ./fernandez-28521.sh
fernandez
Tue Oct 28 05:14:05 PM CDT 2025
```

Figure 3:output 17:19 10/28/2025

From the screenshot above we can see that the program we wrote with nano provides the correct output so no need for debugging.

```
└─(fernandez㉿kali)-[~/Documents/lab-05]
└─$ ./fernandez-28521.sh
./fernandez-28521.sh: line 16: $===: command not found
fernandez
Tue Oct 28 05:30:59 PM CDT 2025
Testing display_ips
Testing scan_localhost
Testing run_cipher

└─(fernandez㉿kali)-[~/Documents/lab-05]
└─$ nano fernandez-28521.sh

└─(fernandez㉿kali)-[~/Documents/lab-05]
└─$ ./fernandez-28521.sh
fernandez
Tue Oct 28 05:32:35 PM CDT 2025
Testing display_ips
Testing scan_localhost
Testing run_cipher

└─(fernandez㉿kali)-[~/Documents/lab-05]
└─$ █
```

Figure 4 program output 17:34 10/28/2025

```
fernandez@kali: ~/Documents/lab-03
Session Actions Edit View Help
GNU nano 8.6    fernandez-28521.sh
#!/bin/bash

# Display your public and private (local network) IP address
display_ips(){
    echo "Testing display_ips"
}

# Run a network scan of our local machine
scan_localhost(){
    echo "Testing scan_localhost"
}

# Encrypt and decrypt a string
run_cipher(){
    echo "Testing run_cipher"
}

# === Main Menu ===

# Display username and date
whoami
date

#call the functions
display_ips
scan_localhost
run_cipher
```

Figure 5:program input 17:35 10/28/2025

The above step shows the program and the output into the terminal. This part did require debugging because at line 16 I first put a \$ instead of a #. The design of the program was key to keeping the script organized and the comments helped show what each function was used for.

BREAKPOINT 2

```
(fernandez㉿kali)-[~/Documents/lab-05]
$ curl -4s ifconfig.me
104.181.71.212

(fernandez㉿kali)-[~/Documents/lab-05]
$ ifconfig | grep 'inet' | grep -v '127.0
' | awk '{print $2}' | head -n1
192.168.1.157

(fernandez㉿kali)-[~/Documents/lab-05]
$ nano fernandez-28521.sh

(fernandez㉿kali)-[~/Documents/lab-05]
$ ./fernandez-28521.sh
My public IP address: 104.181.71.212
My private IP address: 192.168.1.157

fernandez
Tue Oct 28 06:57:11 PM CDT 2025
My public IP address: 104.181.71.212
My private IP address: 192.168.1.157

Testing scan_localhost
Testing run_cipher
```

Figure 6:display_ips 18:57 10/28/2025

```
# Display your public and private (local network) IP address
display_ips(){
    # Get public IP
    public_ip=$(curl -4s ifconfig.me)

    # Get private IP
    private_ip=$(ifconfig | grep 'inet ' | grep -v 'loopback' | grep -v 'inet6' | grep -v 'inet brd' | grep -v 'inet netm')

    # Display public IP
    echo "My public IP address: $public_ip"

    #Display private IP
    echo -e "My private IP address: $private_ip"
}

# Function call
display_ips
```

Figure 7:Display_ips pt 2 19:00 10/28/2025

In the above section I finished the `display_ips` function. The output is also shown above and did not require any debugging. In the example you used a file header to show what the content of the script are going to be. Function comments are also used to keep the script organized and helps the reader understand what each part of the script does.

BREAKPOINT 3

```
scan_localhost(){
    target= "127.0.0.1" # Scan localhost o>

    # present safe scanning options
    echo "≡≡≡ Nmap scan options for localhost"
    echo "[1] Basic Ping scan (Host Discovery)"
    echo "[2] TCP Connect Scan (Top 10 Ports)"
    echo "[3] Service Version Detection (RST Scan)"
    echo "[4] OS detection [requires sudo]"
    echo "[5] Full port scan (all ports)"
    echo "[6] return to main menu"
    echo -n "please choose an option: "
    read choice

    #perform the type of scan based on option
    case $choice in
        1) nmap -sn "$target"
        2) nmap --top-ports 10 -sT "$target" ;;
        3) nmap -sV "$target" ;;
        4) sudo nmap -O "$target" ;;
        5) nmap -p- "$target" ;;
        6) echo -e "Returning to main menu ... >
    esac
}

#function call
scan_localhost
```

Figure 8: nmap script 19:32 10/28/2025

The above script did require some debugging as I forgot to add the “;;” in line 37 which was stopping the script from running correctly. The program allows the user to automate nmap commands by making a selection from the list and running the nmap script. The curl command is used to transfer data and the nmap command is used when using the nmap tool which is a penetration testing tool that can be used for reconnaissance such as port scans.

BREAKPOINT 4

```
fernandez@fernandez-28521:~$ main_menu
ease choose an option: 6
turning to main menu ...

rnandez
e Oct 28 07:42:42 PM CDT 2025
  public IP address: 104.181.71.212
  private IP address: 192.168.1.157

fernandez-28521.sh: line 22: 127.0.0.1: command not found
≡ Nmap scan options for localhost () ≡
] Basic Ping scan (Host Discovery)
] TCP Connect Scan (Top 10 Ports)
] Service Version Detection (Running Software)
] OS detection [requires sudo] (operating system)
] Full port scan (all ports)
] return to main menu
ease choose an option: 6
turning to main menu ...

ts encrypt a string! Enter a string of your choice (or '0' to quit):
Hello
encrypted: Khoor
encrypted: Hello
ts encrypt a string! Enter a string of your choice (or '0' to quit):
█
```

Figure 9: encryption script 19:43 10/28/2025

```

:~$ an_localhost

Encrypt and decrypt a string
in_cipher(){
    This is an unformatted cipher function; please try to pretty it up!
    run=true

    #This while loop runs until the user types a 0 to quit
    while $run; do
        read -p "Lets encrypt a string! Enter a string of you>
        if [[ "$input" == "0" ]]; then
            echo "Than you! Bye !!""
            run=false
        else
            encrypted=$(echo "$input" | tr 'a-zA-Z' 'd-zA-Z')
            decrypted=$(echo "$encrypted" | tr 'a-zA-Z' 'n-zA-m')
            echo "encrypted: $encrypted"
            echo "decrypted: $decrypted"
        fi
    done

    === Main Menu ===

```

Figure 10: encryption script 19:45 10/28/2025

The script above is used to automate the encryption process for a string. It uses the looped Caesar cipher demo which applies a ROT-3 shift to encrypt strings. And it will continue to do so until the user selects the “quit” option.

```

encrypted=$(echo "$input" | tr 'a-z' 'n-zA-m')
decrypted=$(echo "$encrypted" | tr 'a-zA-Z' 'n-zA-m')
echo "encrypted: $encrypted"
echo "decrypted: $decrypted"

```

Figure 11: ROT 13 19:51 10/28/2025

```
running to main menu  
Is encrypt a string! E  
hello  
trypted: uryyb  
trypted: hello  
Is encrypt a string! E
```

Figure 12:ROT 13 output 19:52 10/28/2025

Above, the change in script from a rot 3 to a rot 5 encryption is shown. For this cipher I changed the arguments for “tr” to ‘a-z’ ‘n-za-m’.

```
BREAKPOINT 5  
Oct 28 20:33:03, TM EST, 2025  
/ public IP address: 104.181.71.212  
/ private IP address: 192.168.1.157  
  
≡ Main Menu ≡  
1] Localhost Nmap Scan  
2] Caesar Cipher  
3] Exit  
choose an option
```

Figure 13: main menu 20:32 10/28/2025

```

Display public and private IPs
display_ips

while true; do
    # Display main menu options
    echo -e "\n==== Main Menu ====\n"
    echo "[1] Localhost Nmap Scan"
    echo "[2] Caesar Cipher"
    echo "[3] Exit"
    echo -n "Choose an option"
    read option # Read user input

    #Call the corresponding function based on user's menu selection
    case $option in
        1) scan_localhost ;;          # Run localhost scanning menu
        2) run_cipher ;;           # Run caesar cipher
        3) echo "Goodbye!"; exit ;; # Exit script completely
        *) echo "Invalid option. Try again." ;; #Handle bad input
    esac

    # Pause before looping again so users can see output
    echo
    read -p "press enter to continue ... "
done

§ Help      ^O Write Out  ^F Where Is  ^K Cut      ^T Execute

```

Figure 14: main menu script 20:34 10/28/2025

This part of the program is what directs the rest of the script. From here users can choose what tool they would like to use whether that is Nmap or the cipher. This just being the first version of my script I think for the update I would add some more cosmetics to it. In a way it reminds of the “Lazy script” that it available on github. With a few less tools but the same idea of automating tools.

CONCLUSION/LIMITATIONS

There were a few instances in this lab where debugging was necessary however it was never a big problem. For the most part it was missing characters.

REFERENCES

R. Mitra, “*Lab-05 scripting*,” The University of Texas at San Antonio (2025). Last accessed: 10/28/2025.

GENERATIVE AI SEARCHES

I did not use generative AI to complete this lab report.

COLLABORATION

I worked independently on this lab.

