Task 3

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Required: A script that is executed to print which WIFI network has the highest strength

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Listing Methods I found

1) Using the iw tool for listing

- a tool to manipulate wireless devices
- iwlist was the method to be used to list devices
- `iwlist [interface] scan` command is used to display some information from wireless network interface
- shows ESSID, Quality, Frequency, Mode.
- can only be accessed by root

```
     Cell 01 - Address: 88:03:55:E8:3A:D0
               Quality=23/70  Signal level=-87 dBm
               Encryption key:on
               ESSID:"VGV7519E83ADB"
               IE: WPA Version 1
                   Authentication Suites (1) : PSK
               IE: IEEE 802.11i/WPA2 Version 1
                   Authentication Suites (1) : PSK
      Cell 02 - Address: 88:03:55:E8:3A:D1
               Quality=23/70  Signal level=-87 dBm
               Encryption key:off
               ESSID:"KPN Fon"
     Cell 03 - Address: 90:5C:44:C5:B8:9D
               Quality=59/70  Signal level=-51 dBm
               Encryption key:on
               ESSID:"Doggie"
               IE: WPA Version 1
```

```
                    Authentication Suites (1) : PSK
                IE: IEEE 802.11i/WPA2 Version 1
                    Authentication Suites (1) : PSK
          Cell 04 - Address: 54:FA:3E:60:F9:B1
                    Quality=22/70  Signal level=-88 dBm
                    Encryption key:on
                    ESSID:"HZN249093067"
                    IE: IEEE 802.11i/WPA2 Version 1
                        Authentication Suites (1) : PSK
```

Output Example of iwlist

Command I used

```
output=$(iwlist wlan0 scan | awk -F':=' '/ESSID/{ssid=$2}
/Quality/{print ssid ":" $2}')
```

- Description
  - List wifi networks available
  - use delimiters : or = to separate fields
  - when you recognize the word "ESSID" store the second field in ssid
  - When you find quality append "ssid" and ":" and '$2' denoting second field after quality

Other method

- You can also parse the data by looping through networks but in my opinion the one above is better

2) Using nmlci

- it is a tool that should be manually installed to your distribution
- using the command `nmlci device wifi` you can list all the wifi networks
- you can store the output from the above command in a variable
- and then use the command `nmcli device wifi connect` to connect directly to the best wifi network

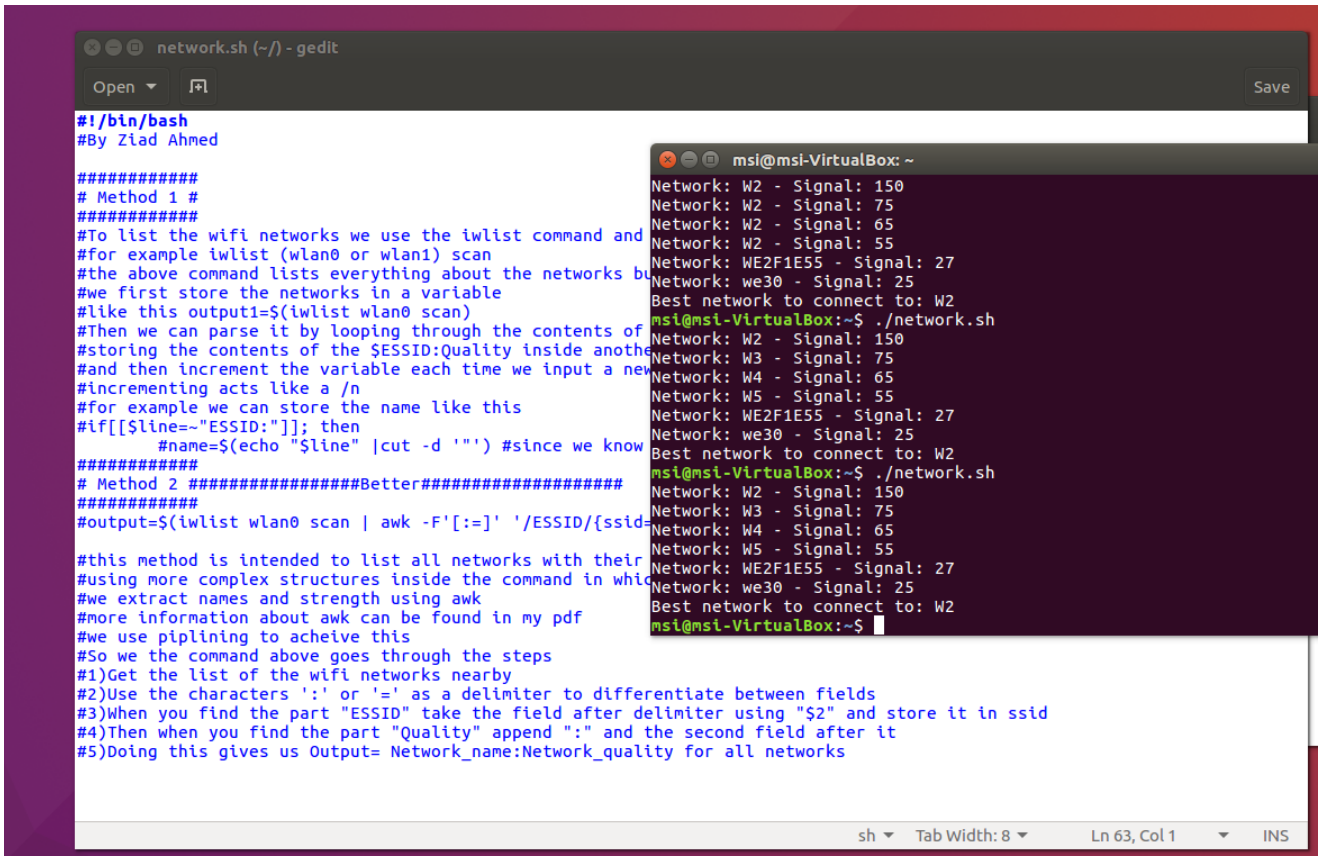
Script to print the best network

- Method used is looping through the data
- using the ':' as delimiter
- using if condition to get the greatest value
- store the name and max quality in 2 variables
- echo the best network if present
- else echo error message

```
output="W2:150
W3:75
W4:65
W5:55
:49
:30
WE2F1E55:27
we30:25"
#Now we need to parse this list into name and strength of signal

max_signal=0            #Variable to hold the maximum signal
initalized with 0
best_network=""         #variable to hold the name of the network

#First we declare the internal field separator as the ":" in which
#contents before the IFS are of another type from contents after it
#so we loop through the list by this while loop
while IFS=: read -r network signal; do
#we loop and store the data before the : in network
#store the data after the : in signal
#We used -r as read command to treat the "/" as literal chars not a
part of a path

    if [[ -n $network ]]; then                          #Check if
the signal name is empty or not for example like ""
        echo "Network: $network - Signal: $signal"      #In this
line we print the network names and strength

#in the following line we check if the signal of the network being
examined is greater than the signal in the variable best_signal
        if [[ $signal -gt $max_signal ]]; then
            max_signal=$signal                  #if true store the
signal here
```

```
            best_network=$network                #and store the
network name here
        fi
    fi
done <<< "$output"      # In this line we tell the loop to use the
list provided to us "OUTPUT"

if [[ -n $best_network ]]; then          #If we obtained a working
network
    echo "Recommended Network: $best_network"
else    #if no networks detected
    echo "Can't recommend any WIFI network"
fi
```

Output obtained



Sources

hyperlinked

- iw tool

- While loop in bash
- Bash flags
- awk parsing tool
- nmlci
- Parsing data in linux