

## Network Engineering 2019 Exercises - Unit 3

### 0.1 Netmask Calculation

**What is the netmask for this network?**

22.137.175.192/26

Put your answer on a single line in `unit3/answers.txt`, with 0: at the beginning of the line, e.g., 0:255.255.255.0

**What is the netmask for this network?**

0.0.0.0/1

Put your answer on a single line in `unit3/answers.txt`, with 1: at the beginning of the line, e.g., 1:255.255.255.0

**What is the netmask for this network?**

123.186.231.128/27

Put your answer on a single line in `unit3/answers.txt`, with 2: at the beginning of the line, e.g., 2:255.255.255.0

**What is the netmask for this network?**

24.63.252.120/29

Put your answer on a single line in `unit3/answers.txt`, with 3: at the beginning of the line, e.g., 3:255.255.255.0

**What is the netmask for this network?**

89.116.93.88/30

Put your answer on a single line in `unit3/answers.txt`, with 4: at the beginning of the line, e.g., 4:255.255.255.0

**What is the netmask for this network?**

64.0.0.0/3

Put your answer on a single line in `unit3/answers.txt`, with 5: at the beginning of the line, e.g., 5:255.255.255.0

**What is the netmask for this network?**

13.28.4.0/23

Put your answer on a single line in `unit3/answers.txt`, with 6: at the beginning of the line, e.g., 6:255.255.255.0

**What is the netmask for this network?**

28.128.0.0/11

Put your answer on a single line in `unit3/answers.txt`, with 7: at the beginning of the line, e.g., 7:255.255.255.0

**What is the netmask for this network?**

96.0.0.0/4

Put your answer on a single line in `unit3/answers.txt`, with 8: at the beginning of the line, e.g., 8:255.255.255.0

**What is the netmask for this network?**

0.0.0.0/0

Put your answer on a single line in `unit3/answers.txt`, with 9: at the beginning of the line, e.g., 9:255.255.255.0

**What is the netmask for this network?**

68.214.178.32/28

Put your answer on a single line in `unit3/answers.txt`, with 10: at the beginning of the line, e.g., 10:255.255.255.0

**What is the netmask for this network?**

20.0.0.0/6

Put your answer on a single line in `unit3/answers.txt`, with 11: at the beginning of the line, e.g., 11:255.255.255.0

**What is the netmask for this network?**

0.0.0.0/0

Put your answer on a single line in `unit3/answers.txt`, with 12: at the beginning of the line, e.g., 12:255.255.255.0

**What is the netmask for this network?**

112.138.2.120/29

Put your answer on a single line in `unit3/answers.txt`, with 13: at the beginning of the line, e.g., 13:255.255.255.0

**What is the netmask for this network?**

21.224.0.0/11

Put your answer on a single line in `unit3/answers.txt`, with 14: at the beginning of the line, e.g., 14:255.255.255.0

**What is the netmask for this network?**

122.0.0.0/9

Put your answer on a single line in `unit3/answers.txt`, with 15: at the beginning of the line, e.g., 15:255.255.255.0

**What is the netmask for this network?**

116.0.0.0/7

Put your answer on a single line in `unit3/answers.txt`, with 16: at the beginning of the line, e.g., 16:255.255.255.0

**What is the netmask for this network?**

68.10.227.200/30

Put your answer on a single line in `unit3/answers.txt`, with 17: at the beginning of the line, e.g., 17:255.255.255.0

**What is the netmask for this network?**

64.0.0.0/5

Put your answer on a single line in `unit3/answers.txt`, with 18: at the beginning of the line, e.g., 18:255.255.255.0

**What is the netmask for this network?**

109.248.124.16/28

Put your answer on a single line in `unit3/answers.txt`, with 19: at the beginning of the line, e.g., 19:255.255.255.0

**What is the netmask for this network?**

38.0.0.0/7

Put your answer on a single line in `unit3/answers.txt`, with 20: at the beginning of the line, e.g., 20:255.255.255.0

**What is the netmask for this network?**

88.112.21.0/26

Put your answer on a single line in `unit3/answers.txt`, with 21: at the beginning of the line, e.g., `21:255.255.255.0`

**What is the netmask for this network?**

30.0.0.0/7

Put your answer on a single line in `unit3/answers.txt`, with 22: at the beginning of the line, e.g., `22:255.255.255.0`

**What is the netmask for this network?**

99.128.0.0/9

Put your answer on a single line in `unit3/answers.txt`, with 23: at the beginning of the line, e.g., `23:255.255.255.0`

**What is the netmask for this network?**

31.198.192.0/18

Put your answer on a single line in `unit3/answers.txt`, with 24: at the beginning of the line, e.g., `24:255.255.255.0`

**What is the netmask for this network?**

40.148.0.0/15

Put your answer on a single line in `unit3/answers.txt`, with 25: at the beginning of the line, e.g., `25:255.255.255.0`

**What is the netmask for this network?**

63.53.152.0/21

Put your answer on a single line in `unit3/answers.txt`, with 26: at the beginning of the line, e.g., `26:255.255.255.0`

**What is the netmask for this network?**

0.0.0.0/0

Put your answer on a single line in `unit3/answers.txt`, with 27: at the beginning of the line, e.g., `27:255.255.255.0`

**What is the netmask for this network?**

98.204.0.0/14

Put your answer on a single line in `unit3/answers.txt`, with 28: at the beginning of the line, e.g., `28:255.255.255.0`

**What is the netmask for this network?**

44.69.74.120/29

Put your answer on a single line in `unit3/answers.txt`, with 29: at the beginning of the line, e.g., `29:255.255.255.0`

**What is the netmask for this network?**

0.0.0.0/1

Put your answer on a single line in `unit3/answers.txt`, with 30: at the beginning of the line, e.g., `30:255.255.255.0`

**What is the netmask for this network?**

37.67.37.134/31

Put your answer on a single line in `unit3/answers.txt`, with 31: at the beginning of the line, e.g., `31:255.255.255.0`

**What is the netmask for this network?**

39.162.0.0/17

Put your answer on a single line in `unit3/answers.txt`, with 32: at the beginning of the line, e.g., `32:255.255.255.0`

**What is the netmask for this network?**

127.0.0.0/10

Put your answer on a single line in `unit3/answers.txt`, with 33: at the beginning of the line, e.g., `33:255.255.255.0`

**What is the netmask for this network?**

69.152.233.128/26

Put your answer on a single line in `unit3/answers.txt`, with 34: at the beginning of the line, e.g., `34:255.255.255.0`

**What is the netmask for this network?**

5.153.114.96/27

Put your answer on a single line in `unit3/answers.txt`, with 35: at the beginning of the line, e.g., 35:255.255.255.0

**What is the netmask for this network?**

48.0.0.0/5

Put your answer on a single line in `unit3/answers.txt`, with 36: at the beginning of the line, e.g., 36:255.255.255.0

**What is the netmask for this network?**

33.213.239.148/31

Put your answer on a single line in `unit3/answers.txt`, with 37: at the beginning of the line, e.g., 37:255.255.255.0

**What is the netmask for this network?**

82.255.156.32/27

Put your answer on a single line in `unit3/answers.txt`, with 38: at the beginning of the line, e.g., 38:255.255.255.0

**What is the netmask for this network?**

87.232.68.0/23

Put your answer on a single line in `unit3/answers.txt`, with 39: at the beginning of the line, e.g., 39:255.255.255.0

## **0.2 Variable Length Sub-net Masking**

**What is the VLSM name of the network corresponding to the following?**

112.47.183.174 netmask 255.255.128.0

Put your answer on a single line in `unit3/answers.txt`, with 40: at the beginning of the line, e.g., 40:10.0.0.0/8

**What is the VLSM name of the network corresponding to the following?**

87.100.29.39 netmask 255.255.255.248

Put your answer on a single line in `unit3/answers.txt`, with 41: at the beginning of the line, e.g., 41:10.0.0.0/8

**What is the VLSM name of the network corresponding to the following?**

61.60.163.7 netmask 255.255.255.240

Put your answer on a single line in `unit3/answers.txt`, with 42: at the beginning of the line, e.g., `42:10.0.0.0/8`

**What is the VLSM name of the network corresponding to the following?**

102.67.181.189 netmask 255.255.255.240

Put your answer on a single line in `unit3/answers.txt`, with 43: at the beginning of the line, e.g., `43:10.0.0.0/8`

**What is the VLSM name of the network corresponding to the following?**

107.111.163.202 netmask 255.255.255.192

Put your answer on a single line in `unit3/answers.txt`, with 44: at the beginning of the line, e.g., `44:10.0.0.0/8`

**What is the VLSM name of the network corresponding to the following?**

24.208.223.26 netmask 240.0.0.0

Put your answer on a single line in `unit3/answers.txt`, with 45: at the beginning of the line, e.g., `45:10.0.0.0/8`

**What is the VLSM name of the network corresponding to the following?**

57.11.151.123 netmask 128.0.0.0

Put your answer on a single line in `unit3/answers.txt`, with 46: at the beginning of the line, e.g., `46:10.0.0.0/8`

**What is the VLSM name of the network corresponding to the following?**

18.146.38.99 netmask 224.0.0.0

Put your answer on a single line in `unit3/answers.txt`, with 47: at the beginning of the line, e.g., `47:10.0.0.0/8`

**What is the VLSM name of the network corresponding to the following?**

39.98.13.242 netmask 128.0.0.0

Put your answer on a single line in `unit3/answers.txt`, with 48: at the beginning of the line, e.g., `48:10.0.0.0/8`

**What is the VLSM name of the network corresponding to the following?**

74.145.130.13 netmask 255.128.0.0

Put your answer on a single line in `unit3/answers.txt`, with 49: at the beginning of the line, e.g., `49:10.0.0.0/8`

**What is the VLSM name of the network corresponding to the following?**

126.150.119.187 netmask 255.255.224.0

Put your answer on a single line in `unit3/answers.txt`, with 50: at the beginning of the line, e.g., `50:10.0.0.0/8`

**What is the VLSM name of the network corresponding to the following?**

90.36.97.164 netmask 255.255.255.240

Put your answer on a single line in `unit3/answers.txt`, with 51: at the beginning of the line, e.g., `51:10.0.0.0/8`

**What is the VLSM name of the network corresponding to the following?**

46.52.123.248 netmask 255.255.255.192

Put your answer on a single line in `unit3/answers.txt`, with 52: at the beginning of the line, e.g., `52:10.0.0.0/8`

**What is the VLSM name of the network corresponding to the following?**

7.188.236.28 netmask 248.0.0.0

Put your answer on a single line in `unit3/answers.txt`, with 53: at the beginning of the line, e.g., `53:10.0.0.0/8`



**What is the VLSM name of the network corresponding to the following?**

1.86.94.213 netmask 240.0.0.0

Put your answer on a single line in `unit3/answers.txt`, with 54: at the beginning of the line, e.g., `54:10.0.0.0/8`

**What is the VLSM name of the network corresponding to the following?**

115.250.155.188 netmask 224.0.0.0

Put your answer on a single line in `unit3/answers.txt`, with 55: at the beginning of the line, e.g., `55:10.0.0.0/8`

**What is the VLSM name of the network corresponding to the following?**

96.34.50.182 netmask 224.0.0.0

Put your answer on a single line in `unit3/answers.txt`, with 56: at the beginning of the line, e.g., `56:10.0.0.0/8`

**What is the VLSM name of the network corresponding to the following?**

32.235.105.32 netmask 255.255.255.248

Put your answer on a single line in `unit3/answers.txt`, with 57: at the beginning of the line, e.g., `57:10.0.0.0/8`

**What is the VLSM name of the network corresponding to the following?**

52.131.152.32 netmask 255.255.255.248

Put your answer on a single line in `unit3/answers.txt`, with 58: at the beginning of the line, e.g., `58:10.0.0.0/8`

**What is the VLSM name of the network corresponding to the following?**

61.107.36.57 netmask 255.192.0.0

Put your answer on a single line in `unit3/answers.txt`, with 59: at the beginning of the line, e.g., `59:10.0.0.0/8`

### 0.3 Configure Network Interfaces using the `ifconfig` and `ip` commands

What is `ifconfig` command equivalent to the following `ip` command sequence (apply any options in the order listed)?

```
ip address add 25.184.31.23/19 dev eth0; ip link set eth0 down
```

Put your answer on a single line in `unit3/answers.txt`, with 60: at the beginning of the line, e.g., 60:`ip blah blah; ip again with other options; ip again with yet other options`

What is `ifconfig` command equivalent to the following `ip` command sequence (apply any options in the order listed)?

```
ip address add 126.3.16.34/16 dev eth0
```

Put your answer on a single line in `unit3/answers.txt`, with 61: at the beginning of the line, e.g., 61:`ip blah blah; ip again with other options; ip again with yet other options`

What is the `ifconfig` command to setup interface `eth0` with the following network settings (apply any options in the order listed)?

```
125.150.152.179 netmask 240.0.0.0, MTU = 2051, PPP remote address 66.36.26.66, but not running
```

Put your answer on a single line in `unit3/answers.txt`, with 62: at the beginning of the line, e.g., 62:`ifconfig moo0 1.2.3.4 netmask 255.0.0.0 -broadcast`

What is the `ifconfig` command to setup interface `eth0` with the following network settings (apply any options in the order listed)?

```
17.102.193.93 netmask 255.255.255.248, MTU = 4032, PPP remote address 7.122.31.128, TX queue length = 1036
```

Put your answer on a single line in `unit3/answers.txt`, with 63: at the beginning of the line, e.g., 63:`ifconfig moo0 1.2.3.4 netmask 255.0.0.0 -broadcast`

What is `ip` command sequence equivalent to the following `ifconfig` command (apply any options in the order listed)?

```
ifconfig eth0 5.225.54.29 netmask 255.248.0.0 mtu 607 promisc
```

Put your answer on a single line in `unit3/answers.txt`, with 64: at the beginning of the line, e.g., 64:`ip blah blah; ip again with other options; ip again with yet other options`

**What is ip command sequence to setup interface eth0 with the following network settings (apply any options in the order listed)?**

95.64.199.8 netmask 128.0.0.0, but not running, without ARP

Put your answer on a single line in `unit3/answers.txt`, with 65: at the beginning of the line, e.g., `65:ip blah blah; ip again with other options; ip again with yet other options`

**What is ip command sequence to setup interface eth0 with the following network settings (apply any options in the order listed)?**

63.18.0.52 netmask 248.0.0.0

Put your answer on a single line in `unit3/answers.txt`, with 66: at the beginning of the line, e.g., `66:ip blah blah; ip again with other options; ip again with yet other options`

**What is ip command sequence to setup interface eth0 with the following network settings (apply any options in the order listed)?**

54.179.230.114 netmask 248.0.0.0

Put your answer on a single line in `unit3/answers.txt`, with 67: at the beginning of the line, e.g., `67:ip blah blah; ip again with other options; ip again with yet other options`

**What is the ifconfig command to setup interface eth0 with the following network settings (apply any options in the order listed)?**

62.179.34.153 netmask 255.252.0.0, MTU = 3547, without ARP, in promiscuous mode

Put your answer on a single line in `unit3/answers.txt`, with 68: at the beginning of the line, e.g., `68:ifconfig moo0 1.2.3.4 netmask 255.0.0.0 -broadcast`

**What is ifconfig command equivalent to the following ip command sequence (apply any options in the order listed)?**

`ip address add 106.10.138.31/7 dev eth0; ip link set eth0 down; ip link set dev eth0 promisc on`

Put your answer on a single line in `unit3/answers.txt`, with 69: at the beginning of the line, e.g., `69:ip blah blah; ip again with other options; ip again with yet other options`

**What is ip command sequence equivalent to the following ifconfig command (apply any options in the order listed)?**

`ifconfig eth0 109.109.210.194 netmask 255.255.255.254 mtu 2376`

Put your answer on a single line in `unit3/answers.txt`, with 70: at the beginning of the line, e.g., 70:`ip blah blah; ip again with other options; ip again with yet other options`

**What is ip command sequence to setup interface eth0 with the following network settings (apply any options in the order listed)?**

`21.15.181.4 netmask 255.0.0.0, MTU = 2406, TX queue length = 3749`

Put your answer on a single line in `unit3/answers.txt`, with 71: at the beginning of the line, e.g., 71:`ip blah blah; ip again with other options; ip again with yet other options`

**What is ip command sequence to setup interface eth0 with the following network settings (apply any options in the order listed)?**

`107.36.151.164 netmask 255.255.0.0, MTU = 2470, in promiscuous mode`

Put your answer on a single line in `unit3/answers.txt`, with 72: at the beginning of the line, e.g., 72:`ip blah blah; ip again with other options; ip again with yet other options`

**What is the ifconfig command to setup interface eth0 with the following network settings (apply any options in the order listed)?**

`92.130.91.94 netmask 255.255.252.0, TX queue length = 3945`

Put your answer on a single line in `unit3/answers.txt`, with 73: at the beginning of the line, e.g., 73:`ifconfig moo0 1.2.3.4 netmask 255.0.0.0 -broadcast`

**What is ip command sequence to setup interface eth0 with the following network settings (apply any options in the order listed)?**

`35.125.174.20 netmask 255.255.255.248, MTU = 1530, without ARP, in promiscuous mode`

Put your answer on a single line in `unit3/answers.txt`, with 74: at the beginning of the line, e.g., 74:`ip blah blah; ip again with other options; ip again with yet other options`

**What is ip command sequence equivalent to the following ifconfig command (apply any options in the order listed)?**

```
ifconfig eth0 100.88.122.5 netmask 255.255.255.0 txqueuelen 3590
```

Put your answer on a single line in `unit3/answers.txt`, with 75: at the beginning of the line, e.g., 75:ip blah blah; ip again with other options; ip again with yet other options

**What is ip command sequence equivalent to the following ifconfig command (apply any options in the order listed)?**

```
ifconfig eth0 44.165.108.237 netmask 255.255.0.0 mtu 2586
```

Put your answer on a single line in `unit3/answers.txt`, with 76: at the beginning of the line, e.g., 76:ip blah blah; ip again with other options; ip again with yet other options

**What is ip command sequence equivalent to the following ifconfig command (apply any options in the order listed)?**

```
ifconfig eth0 73.43.164.75 netmask 255.252.0.0 mtu 2667 promisc
```

Put your answer on a single line in `unit3/answers.txt`, with 77: at the beginning of the line, e.g., 77:ip blah blah; ip again with other options; ip again with yet other options

**What is the ifconfig command to setup interface eth0 with the following network settings (apply any options in the order listed)?**

```
5.100.85.230 netmask 0.0.0.0, PPP remote address 123.37.228.62,  
TX queue length = 1295
```

Put your answer on a single line in `unit3/answers.txt`, with 78: at the beginning of the line, e.g., 78:ifconfig moo0 1.2.3.4 netmask 255.0.0.0 -broadcast

**What is ip command sequence to setup interface eth0 with the following network settings (apply any options in the order listed)?**

```
42.21.16.16 netmask 255.224.0.0
```

Put your answer on a single line in `unit3/answers.txt`, with 79: at the beginning of the line, e.g., 79:ip blah blah; ip again with other options; ip again with yet other options

## 0.4 Configure Network Interfaces using `/etc/network/interfaces` file

### 0.4.1 Prepare `unit3/iface0-solution.txt`

Produce an `interfaces` file in `unit3/iface0-solution.txt`, that contains the following:

- A template called `ruins0`, that specifies an MTU of 625 and MAC address `2C:D1:07:4F:D6:A1`.
- A template called `castle1`, that specifies an MTU of 6032 and MAC address `41:94:F4:7F:0D:42`.
- A template called `wealth2`, that specifies an MTU of 5071 and MAC address `42:9B:7E:52:86:B3`.
- An interface named `wlan0`, with IPv4 settings configured by DHCP, and inherits the template `wealth2`.
- An interface named `jam1`, with IPv4 address `53.100.5.7` and netmask `255.255.255.0`, and inherits the template `wealth2`.
- An interface named `eth2`, with IPv4 address `55.94.127.175` and netmask `0.0.0.0`.
- An interface named `wlan3`, with IPv4 settings configured by DHCP, and inherits the template `ruins0`.
- An interface named `wlan4`, with IPv4 address `32.95.32.117` and netmask `224.0.0.0`, and inherits the template `wealth2`.
- An interface named `jam5`, with IPv4 address `96.83.147.167` and netmask `255.255.255.128`.
- An interface named `wlan6`, with IPv4 address `116.226.66.202` and netmask `255.0.0.0`.

### 0.4.2 Prepare `unit3/iface1-solution.txt`

Produce an `interfaces` file in `unit3/iface1-solution.txt`, that contains the following:

- A template called `castle0`, that specifies an MTU of 4751 and MAC address `76:59:7F:7B:C4:81`.
- A template called `wealth1`, that specifies an MTU of 6367 and MAC address `03:BA:C4:25:30:A7`.
- An interface named `ftdi0`, with IPv4 settings configured by DHCP, and inherits the template `castle0`.

- An interface named `eth1`, with IPv4 address `5.196.112.59` and netmask `255.255.255.240`, and inherits the template `wealth1`.
- An interface named `eth2`, with IPv4 settings configured by DHCP, and inherits the template `wealth1`.

#### 0.4.3 Prepare `unit3/iface2-solution.txt`

Produce an `interfaces` file in `unit3/iface2-solution.txt`, that contains the following:

- A template called `castle0`, that specifies an MTU of `8622` and MAC address `23:E2:CD:26:9D:92`.
- A template called `moths1`, that specifies an MTU of `5441` and MAC address `39:2E:F0:16:54:BB`.
- A template called `moths2`, that specifies an MTU of `3590` and MAC address `F6:27:AA:BA:AC:8C`.
- A template called `ruins3`, that specifies an MTU of `981` and MAC address `18:40:DD:FD:E2:AB`.
- An interface named `wlan0`, with IPv4 settings configured by DHCP, and inherits the template `ruins3`.
- An interface named `eth1`, with IPv4 address `92.228.163.119` and netmask `255.255.255.0`.
- An interface named `jam2`, with IPv4 settings configured by DHCP.
- An interface named `jam3`, with IPv4 settings configured by DHCP.
- An interface named `jam4`, with IPv4 address `96.164.216.203` and netmask `255.255.128.0`, and inherits the template `castle0`.
- An interface named `eth5`, with IPv4 settings configured by DHCP, and inherits the template `moths2`.
- An interface named `wlan6`, with IPv4 settings configured by DHCP.

#### 0.4.4 Prepare `unit3/iface3-solution.txt`

Produce an `interfaces` file in `unit3/iface3-solution.txt`, that contains the following:

- A template called `wealth0`, that specifies an MTU of `7114` and MAC address `01:9B:DC:A5:1D:70`.
- A template called `moths1`, that specifies an MTU of `4946` and MAC address `AF:93:1C:7A:04:FC`.

- A template called `ruins2`, that specifies an MTU of 6414 and MAC address `B8:3E:49:20:C6:E2`.
- An interface named `jam0`, with IPv4 address `80.221.60.195` and netmask `254.0.0.0`.
- An interface named `ftdi1`, with IPv4 settings configured by DHCP.
- An interface named `jam2`, with IPv4 settings configured by DHCP.
- An interface named `wlan3`, with IPv4 settings configured by DHCP.
- An interface named `ftdi4`, with IPv4 address `82.250.4.205` and netmask `192.0.0.0`, and inherits the template `wealth0`.
- An interface named `ftdi5`, with IPv4 address `46.132.172.205` and netmask `255.255.255.224`.
- An interface named `wlan6`, with IPv4 settings configured by DHCP, and inherits the template `moths1`.

#### 0.4.5 Prepare `unit3/iface4-solution.txt`

Produce an `interfaces` file in `unit3/iface4-solution.txt`, that contains the following:

- A template called `ruins0`, that specifies an MTU of 4932 and MAC address `DA:A3:63:9D:B5:99`.
- A template called `moths1`, that specifies an MTU of 4835 and MAC address `62:CE:B4:2F:70:4E`.
- A template called `moths2`, that specifies an MTU of 2635 and MAC address `26:80:47:C4:2F:D9`.
- A template called `ruins3`, that specifies an MTU of 7642 and MAC address `A2:4D:C1:BC:80:C2`.
- A template called `wealth4`, that specifies an MTU of 5514 and MAC address `65:8B:F8:1B:24:1F`.
- An interface named `ftdi0`, with IPv4 settings configured by DHCP.
- An interface named `wlan1`, with IPv4 settings configured by DHCP, and inherits the template `ruins3`.
- An interface named `wlan2`, with IPv4 address `41.84.124.126` and netmask `255.255.255.0`, and inherits the template `moths2`.



## 0.5 Create and delete routes

**0.5.1 Create files `unit3/routes0add.sh` and `unit3/routes0del.sh` that contains commands that will respectively establish and delete the following routes**

- 50.138.128.0/17 via the IP address of your 2nd VM
- 75.148.76.128/28 via the IP address of your 2nd VM
- 19.22.44.0/22 via the IP address of your 2nd VM
- 110.213.12.208/28 via the IP address of your 2nd VM
- 52.244.128.0/17 via the interface to your 2nd VM
- 112.60.187.196/30 via the interface to your 2nd VM

**0.5.2 Create files `unit3/routes1add.sh` and `unit3/routes1del.sh` that contains commands that will respectively establish and delete the following routes**

- 68.56.206.64/26 via the IP address of your 2nd VM
- 26.239.195.212/30 via the interface to your 2nd VM
- 39.243.45.160/28 via the IP address of your 2nd VM
- 112.253.8.0/26 via the interface to your 2nd VM
- 21.180.51.0/24 via the interface to your 2nd VM
- 43.232.100.60/31 via the interface to your 2nd VM

**0.5.3 Create files `unit3/routes2add.sh` and `unit3/routes2del.sh` that contains commands that will respectively establish and delete the following routes**

- 52.153.94.0/23 via the IP address of your 2nd VM
- 92.140.128.0/20 via the IP address of your 2nd VM
- 49.189.116.12/30 via the IP address of your 2nd VM
- 71.113.164.0/22 via the interface to your 2nd VM
- 115.90.8.0/21 via the interface to your 2nd VM
- 82.226.157.176/28 via the IP address of your 2nd VM

**0.5.4 Create files `unit3/routes3add.sh` and `unit3/routes3del.sh` that contains commands that will respective establish and delete the following routes**

- 18.227.52.0/24 via the interface to your 2nd VM
- 71.124.0.0/16 via the IP address of your 2nd VM
- 111.154.147.224/28 via the IP address of your 2nd VM
- 49.107.89.64/27 via the IP address of your 2nd VM
- 109.58.100.0/23 via the IP address of your 2nd VM
- 31.15.176.0/20 via the IP address of your 2nd VM

**0.5.5 Create files `unit3/routes4add.sh` and `unit3/routes4del.sh` that contains commands that will respective establish and delete the following routes**

- 109.166.55.176/28 via the interface to your 2nd VM
- 67.41.172.240/29 via the interface to your 2nd VM
- 82.176.198.0/28 via the interface to your 2nd VM
- 41.169.128.0/17 via the interface to your 2nd VM
- 115.252.82.160/28 via the IP address of your 2nd VM
- 89.52.164.200/29 via the IP address of your 2nd VM