

## Network Engineering 2019 Exercises - Unit 3

### 0.1 Netmask Calculation

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

9.2.160.0/19

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?**

64.0.0.0/2

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?**

72.0.0.0/5

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?**

71.5.80.0/20

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?**

16.61.0.0/17

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?**

40.0.0.0/5

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?**

96.0.0.0/4

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?**

58.32.149.208/28

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?**

20.0.0.0/6

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?**

6.56.0.0/14

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?**

77.51.173.160/28

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?**

0.0.0.0/1

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?**

111.192.0.0/11

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?**

55.96.0.0/11

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?**

53.0.0.0/12

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?**

1.34.89.0/27

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?**

122.128.0.0/9

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?**

46.5.0.0/17

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?**

16.0.0.0/4

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?**

0.0.0.0/0

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?**

14.0.0.0/7

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?**

17.246.0.0/15

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?**

0.0.0.0/1

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?**

0.0.0.0/0

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?**

20.10.128.0/17

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?**

0.0.0.0/9

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?**

14.0.0.0/8

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?**

88.0.0.0/7

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?**

53.15.0.0/18

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?**

56.0.0.0/6

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?**

64.0.0.0/9

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?**

40.18.96.224/29

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?**

38.114.198.178/31

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?**

0.0.0.0/0

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?**

75.34.128.0/19

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?**

95.189.222.128/26

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?**

16.0.0.0/6

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?**

76.0.0.0/6

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?**

61.206.24.0/21

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?**

28.18.0.0/15

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?**

82.251.181.134 netmask 255.255.252.0

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?**

51.23.46.56 netmask 255.255.224.0

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?**

54.18.119.158 netmask 192.0.0.0

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?**

96.104.6.155 netmask 255.255.192.0

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?**

27.217.189.212 netmask 255.252.0.0

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?**

85.48.232.184 netmask 255.255.192.0

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?**

84.6.82.151 netmask 255.255.255.192

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?**

22.242.50.111 netmask 255.128.0.0

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?**

83.91.23.89 netmask 255.255.255.248

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?**

53.114.188.201 netmask 255.255.255.248

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?**

78.158.164.112 netmask 255.192.0.0

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?**

121.73.4.23 netmask 255.224.0.0

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?**

6.230.79.17 netmask 128.0.0.0

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?**

46.61.208.17 netmask 255.255.255.0

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?**

86.112.222.246 netmask 255.255.255.0

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?**

22.141.61.39 netmask 255.255.255.248

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?**

102.111.172.206 netmask 255.255.255.254

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?**

11.51.107.176 netmask 255.248.0.0

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?**

85.103.126.98 netmask 255.224.0.0

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?**

7.163.173.95 netmask 255.255.252.0

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

5.65.114.89 netmask 255.255.255.0, PPP remote address 90.23.223.178

Put your answer on a single line in `unit3/answers.txt`, with 60: at the beginning of the line, e.g., `60: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 75.201.71.198 netmask 255.248.0.0 mtu 3621 txqueuelen 2319`

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

`ifconfig eth0 13.143.108.213 netmask 255.192.0.0 -arp`

Put your answer on a single line in `unit3/answers.txt`, with 62: at the beginning of the line, e.g., `62: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 9.159.189.42/14 dev eth0; ip link set dev eth0 down; ip link set dev eth0 arp off; ip link set dev eth0 promisc on; ip link set dev eth0 txqueuelen 3458`

Put your answer on a single line in `unit3/answers.txt`, with 63: at the beginning of the line, e.g., `63: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 97.30.250.245 netmask 255.255.240.0`

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

`ip address add 24.45.114.175/4 dev eth0`

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)?**

`66.222.2.218 netmask 255.255.255.240, in promiscuous mode`

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)?**

`102.13.162.116 netmask 255.255.254.0, but not running`

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

`7.180.134.212 netmask 255.255.255.0, 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: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)?**

`27.154.129.255 netmask 255.255.248.0, TX queue length = 2345`

Put your answer on a single line in `unit3/answers.txt`, with 69: at the beginning of the line, e.g., `69: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)?**

35.35.159.244 netmask 0.0.0.0, without ARP

Put your answer on a single line in `unit3/answers.txt`, with 70: at the beginning of the line, e.g., 70:`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 51.68.175.198/5 dev eth0; ip link set dev eth0 arp off`

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 equivalent to the following `ifconfig` command (apply any options in the order listed)?**

`ifconfig eth0 19.139.115.145 netmask 255.255.0.0 mtu 1348`

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)?**

123.50.170.169 netmask 255.0.0.0, but not running, without ARP,  
TX queue length = 3212

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

29.137.196.67 netmask 255.0.0.0, PPP remote address 102.132.41.166

Put your answer on a single line in `unit3/answers.txt`, with 74: at the beginning of the line, e.g., 74:`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)?**

8.163.46.247 netmask 255.255.255.224, PPP remote address 19.20.131.65,  
TX queue length = 691

Put your answer on a single line in `unit3/answers.txt`, with 75: at the beginning of the line, e.g., 75:`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)?**

123.38.207.115 netmask 255.255.255.248, MTU = 663, but not running, in promiscuous mode

Put your answer on a single line in `unit3/answers.txt`, with 76: at the beginning of the line, e.g., 76:`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)?**

60.34.220.162 netmask 255.255.255.0, without ARP

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

`ip address add 126.190.26.156/4 dev eth0`

Put your answer on a single line in `unit3/answers.txt`, with 78: at the beginning of the line, e.g., 78:`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 106.39.152.43 netmask 255.255.255.224 down`

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 1678 and MAC address 81:40:36:AB:7F:F4.
- A template called `moths1`, that specifies an MTU of 3232 and MAC address DD:1C:C0:01:AA:E5.
- A template called `moths2`, that specifies an MTU of 1022 and MAC address 58:E2:95:83:1D:EB.
- An interface named `jam0`, with IPv4 address 93.46.203.182 and netmask 255.252.0.0.
- An interface named `ftdi1`, with IPv4 address 30.109.19.160 and netmask 255.255.0.0.
- An interface named `jam2`, with IPv4 settings configured by DHCP, and inherits the template `ruins0`.

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

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

- A template called `moths0`, that specifies an MTU of 1216 and MAC address 63:E2:D9:CA:44:31.
- A template called `wealth1`, that specifies an MTU of 3205 and MAC address B4:CA:C4:D6:80:92.
- A template called `castle2`, that specifies an MTU of 8119 and MAC address 6F:1A:83:C9:3C:14.
- An interface named `ftdi0`, with IPv4 settings configured by DHCP, and inherits the template `castle2`.
- An interface named `jam1`, with IPv4 address 10.124.186.91 and netmask 255.224.0.0.
- An interface named `wlan2`, with IPv4 address 63.254.48.109 and netmask 128.0.0.0.

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

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

- A template called `moths0`, that specifies an MTU of 3391 and MAC address `E0:63:B1:5A:96:20`.
- A template called `wealth1`, that specifies an MTU of 5898 and MAC address `EA:B0:2E:44:B9:51`.
- A template called `castle2`, that specifies an MTU of 4785 and MAC address `A8:62:38:F3:05:76`.
- An interface named `eth0`, with IPv4 settings configured by DHCP.
- An interface named `wlan1`, with IPv4 settings configured by DHCP, and inherits the template `moths0`.
- An interface named `jam2`, with IPv4 settings configured by DHCP, and inherits the template `castle2`.
- An interface named `wlan3`, with IPv4 settings configured by DHCP, and inherits the template `castle2`.
- An interface named `ftdi4`, with IPv4 address `102.244.41.107` and netmask `255.224.0.0`, and inherits the template `castle2`.
- An interface named `ftdi5`, with IPv4 address `22.42.158.25` and netmask `255.255.252.0`, and inherits the template `moths0`.
- An interface named `wlan6`, with IPv4 settings configured by DHCP, and inherits the template `wealth1`.

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

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

- A template called `moths0`, that specifies an MTU of 6882 and MAC address `39:C3:29:66:98:DB`.
- A template called `moths1`, that specifies an MTU of 5042 and MAC address `DE:6B:91:89:61:35`.
- A template called `wealth2`, that specifies an MTU of 8832 and MAC address `4E:DF:CA:5F:02:C4`.
- A template called `castle3`, that specifies an MTU of 275 and MAC address `2E:96:8A:6A:8D:29`.

- An interface named `ftdi0`, with IPv4 address 113.152.126.198 and netmask 255.240.0.0, and inherits the template `moths1`.
- An interface named `jam1`, with IPv4 address 28.30.116.4 and netmask 255.224.0.0, and inherits the template `moths0`.
- An interface named `wlan2`, with IPv4 address 67.214.172.208 and netmask 255.255.192.0.

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

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

- A template called `moths0`, that specifies an MTU of 500 and MAC address 86:BC:E2:21:EA:79.
- A template called `moths1`, that specifies an MTU of 2516 and MAC address 06:D4:65:CC:C0:9F.
- An interface named `ftdi0`, with IPv4 address 20.122.47.69 and netmask 255.255.240.0, and inherits the template `moths1`.
- An interface named `ftdi1`, with IPv4 settings configured by DHCP.
- An interface named `eth2`, with IPv4 settings configured by DHCP.

### 0.5 Create and delete routes

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

- 65.243.227.208/30 via the IP address of your 2nd VM
- 97.93.105.220/30 via the IP address of your 2nd VM
- 70.22.128.0/18 via the interface to your 2nd VM
- 28.104.128.0/19 via the IP address of your 2nd VM
- 69.83.145.0/24 via the IP address of your 2nd VM
- 26.40.32.0/19 via the IP address of your 2nd VM



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

- 33.189.0.0/17 via the IP address of your 2nd VM
- 41.153.148.160/28 via the interface to your 2nd VM
- 69.33.228.244/31 via the interface to your 2nd VM
- 66.136.213.64/26 via the interface to your 2nd VM
- 35.230.63.0/25 via the IP address of your 2nd VM
- 75.185.6.0/23 via the IP address of your 2nd VM

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

- 123.241.156.0/22 via the IP address of your 2nd VM
- 18.227.253.172/30 via the IP address of your 2nd VM
- 106.30.224.0/19 via the interface to your 2nd VM
- 85.186.128.160/27 via the interface to your 2nd VM
- 77.60.0.0/19 via the IP address of your 2nd VM
- 94.184.64.0/23 via the interface to 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**

- 108.178.215.128/26 via the IP address of your 2nd VM
- 52.99.0.0/16 via the IP address of your 2nd VM
- 22.49.189.84/30 via the interface to your 2nd VM
- 115.103.97.204/30 via the interface to your 2nd VM
- 73.33.226.128/25 via the interface to your 2nd VM
- 85.38.41.0/24 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**

- 96.7.236.192/26 via the IP address of your 2nd VM
- 83.142.251.144/29 via the IP address of your 2nd VM
- 111.250.0.0/16 via the IP address of your 2nd VM
- 70.87.224.0/19 via the IP address of your 2nd VM
- 116.251.160.0/20 via the IP address of your 2nd VM
- 85.54.0.0/16 via the IP address of your 2nd VM