

## Network Engineering 2019 Exercises - Unit 3

### 0.1 Netmask Calculation

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

0.0.0.0/0

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?**

24.64.0.0/12

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?**

26.123.64.0/18

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?**

12.206.201.48/29

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?**

72.89.98.230/31

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?**

25.95.245.32/28

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?**

93.69.92.96/29

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?**

15.224.0.0/14

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?**

86.11.52.16/31

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?**

64.0.0.0/6

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?**

40.54.0.0/15

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?**

104.52.0.0/17

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?**

113.89.252.0/22

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?**

88.0.0.0/7

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?**

20.70.199.232/30

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?**

7.60.152.164/30

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?**

104.104.35.0/24

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?**

65.50.0.0/15

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?**

111.97.205.8/30

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?**

44.32.0.0/17

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?**

18.12.0.0/16

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?**

0.0.0.0/0

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?**

29.47.0.0/16

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?**

106.248.29.238/31

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?**

37.160.0.0/12

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?**

108.64.0.0/10

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?**

48.96.0.0/12

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?**

6.32.0.0/11

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?**

0.0.0.0/1

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?**

61.224.0.0/11

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?**

48.24.39.0/24

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?**

37.171.191.168/31

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?**

100.162.144.0/20

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?**

27.99.191.32/28

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?**

52.223.216.32/27

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?**

11.191.0.0/16

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?**

13.4.21.96/27

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?**

54.61.235.0/25

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?**

18.35.236.170/31

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?**

29.109.96.192/27

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?**

78.46.190.11 netmask 255.255.255.248

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?**

5.164.148.69 netmask 254.0.0.0

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?**

94.53.132.233 netmask 128.0.0.0

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?**

32.85.96.146 netmask 255.224.0.0

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?**

107.69.175.66 netmask 248.0.0.0

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?**

61.225.170.23 netmask 192.0.0.0

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?**

35.93.111.222 netmask 0.0.0.0

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?**

51.222.34.97 netmask 255.254.0.0

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?**

74.107.209.20 netmask 255.255.0.0

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?**

92.4.120.203 netmask 254.0.0.0

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?**

22.197.209.75 netmask 255.255.255.0

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?**

70.55.220.183 netmask 255.255.252.0

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?**

46.196.94.84 netmask 255.0.0.0

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?**

77.253.7.207 netmask 255.255.255.254

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?**

29.171.208.199 netmask 254.0.0.0

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?**

120.176.210.90 netmask 255.255.192.0

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?**

117.33.205.197 netmask 0.0.0.0

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?**

106.111.158.57 netmask 255.252.0.0

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?**

10.27.206.97 netmask 255.240.0.0

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?**

87.63.134.58 netmask 224.0.0.0

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 105.0.26.177/17 dev eth0
```

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

```
112.98.17.41 netmask 255.248.0.0, but not running, TX queue length  
= 2684
```

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

```
ip address add 34.191.137.179/16 dev eth0; ip link set dev eth0 mtu  
4346; ip link set dev eth0 down
```

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 39.143.39.189/20 dev eth0; ip link set dev eth0 arp  
off; ip link set dev eth0 promisc on
```

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

```
120.121.93.70 netmask 255.255.255.128, MTU = 2663, TX queue  
length = 1880
```

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

```
ifconfig eth0 36.207.122.162 netmask 255.255.254.0
```

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

```
ifconfig eth0 109.32.247.243 netmask 255.0.0.0
```

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

```
ifconfig eth0 14.64.17.228 netmask 255.255.255.248 mtu 2673 promisc
```

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)?**

```
27.67.34.116 netmask 252.0.0.0, MTU = 2186, without ARP, TX  
queue length = 3966
```

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

```
126.191.200.130 netmask 255.255.255.248
```

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

```
ip address add 90.192.149.73/11 dev eth0; ip link set dev eth0 down;  
ip link set dev eth0 promisc on
```

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

```
ifconfig eth0 0.215.252.111 netmask 255.255.0.0 down
```

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

```
ip address add 19.8.247.47/18 dev eth0; ip link set dev eth0 down;  
ip link set dev eth0 promisc on
```

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)?**

```
46.85.192.175 netmask 255.255.128.0, TX queue length = 3166
```

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)?**

```
108.177.8.72 netmask 255.240.0.0, but not running
```

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

```
ifconfig eth0 28.46.148.224 netmask 255.254.0.0 -arp
```

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 22.65.31.31 netmask 255.252.0.0 -arp
```

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

```
ip address add 122.249.146.115/22 dev eth0; ip link set dev eth0 mtu 3659; ip link set dev eth0 down; ip link set dev eth0 txqueuelen 3444
```

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

```
ifconfig eth0 0.130.184.189 netmask 255.255.128.0 down txqueuelen 1022
```

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

```
110.56.108.238 netmask 255.128.0.0, PPP remote address 62.97.99.88
```

Put your answer on a single line in `unit3/answers.txt`, with 79: at the beginning of the line, e.g., 79:ifconfig moo0 1.2.3.4 netmask 255.0.0.0 -broadcast

## 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 `moths0`, that specifies an MTU of 8952 and MAC address `FF:2F:82:55:F3:02`.
- A template called `wealth1`, that specifies an MTU of 6957 and MAC address `93:BB:5D:F7:6E:AB`.
- An interface named `ftdi0`, with IPv4 settings configured by DHCP.
- An interface named `jam1`, with IPv4 address `43.220.7.146` and netmask `255.255.255.192`.
- An interface named `wlan2`, with IPv4 settings configured by DHCP, and inherits the template `wealth1`.

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

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

- A template called `wealth0`, that specifies an MTU of 691 and MAC address `CE:00:25:E6:B1:B9`.
- A template called `ruins1`, that specifies an MTU of 6230 and MAC address `B0:10:B9:4C:E8:87`.
- A template called `castle2`, that specifies an MTU of 3390 and MAC address `85:68:04:94:B4:2C`.
- An interface named `eth0`, with IPv4 settings configured by DHCP.
- An interface named `wlan1`, with IPv4 address `6.250.237.161` and netmask `255.255.240.0`.
- An interface named `wlan2`, with IPv4 settings configured by DHCP.
- An interface named `ftdi3`, with IPv4 address `18.3.208.84` and netmask `255.0.0.0`.
- An interface named `ftdi4`, with IPv4 address `68.213.146.239` and netmask `255.255.240.0`.
- An interface named `ftdi5`, with IPv4 address `93.17.119.19` and netmask `255.255.255.252`.
- An interface named `eth6`, with IPv4 settings configured by DHCP, and inherits the template `ruins1`.

#### 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 6176 and MAC address 94:22:8F:E9:68:67.
- A template called `wealth1`, that specifies an MTU of 988 and MAC address EF:E6:C9:C4:D5:5E.
- A template called `castle2`, that specifies an MTU of 7727 and MAC address 78:81:4D:26:48:B7.
- An interface named `jam0`, with IPv4 address 65.75.183.186 and netmask 255.255.254.0.
- An interface named `ftdi1`, with IPv4 address 73.87.150.45 and netmask 128.0.0.0.
- An interface named `eth2`, with IPv4 settings configured by DHCP, and inherits the template `castle2`.

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

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

- A template called `ruins0`, that specifies an MTU of 6877 and MAC address E7:47:AF:56:56:27.
- A template called `moths1`, that specifies an MTU of 6439 and MAC address 4E:20:5A:D1:DA:B2.
- A template called `wealth2`, that specifies an MTU of 1293 and MAC address 80:05:CF:BE:C7:33.
- A template called `moths3`, that specifies an MTU of 8894 and MAC address FF:BF:FD:87:E2:6E.
- A template called `wealth4`, that specifies an MTU of 2806 and MAC address B5:88:20:0B:AF:F7.
- An interface named `wlan0`, with IPv4 settings configured by DHCP, and inherits the template `moths3`.
- An interface named `jam1`, with IPv4 settings configured by DHCP.
- An interface named `wlan2`, with IPv4 settings configured by DHCP, and inherits the template `ruins0`.

- An interface named jam3, with IPv4 address 49.188.101.67 and netmask 192.0.0.0, and inherits the template wealth2.
- An interface named jam4, with IPv4 address 29.138.35.239 and netmask 252.0.0.0.
- An interface named eth5, with IPv4 settings configured by DHCP.
- An interface named eth6, with IPv4 settings configured by DHCP.

#### 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 1306 and MAC address DD:B8:AA:5E:3C:8F.
- A template called castle1, that specifies an MTU of 4727 and MAC address 72:E5:A5:C3:C4:94.
- A template called ruins2, that specifies an MTU of 2760 and MAC address A4:DB:43:AB:9C:57.
- A template called ruins3, that specifies an MTU of 4785 and MAC address 3A:D9:EA:C4:68:A9.
- A template called moths4, that specifies an MTU of 2469 and MAC address 62:A5:A3:9E:34:81.
- An interface named jam0, with IPv4 address 11.196.42.166 and netmask 252.0.0.0, and inherits the template moths0.
- An interface named jam1, with IPv4 settings configured by DHCP.
- An interface named wlan2, with IPv4 settings configured by DHCP.
- An interface named ftdi3, with IPv4 settings configured by DHCP.
- An interface named jam4, with IPv4 address 113.168.174.163 and netmask 255.224.0.0.
- An interface named wlan5, with IPv4 settings configured by DHCP.
- An interface named wlan6, with IPv4 address 87.98.177.107 and netmask 224.0.0.0.



## 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**

- 61.223.104.0/24 via the interface to your 2nd VM
- 102.42.2.156/30 via the IP address of your 2nd VM
- 12.92.209.208/28 via the interface to your 2nd VM
- 63.220.171.0/24 via the interface to your 2nd VM
- 76.232.149.128/26 via the IP address of your 2nd VM
- 28.24.69.28/31 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**

- 69.247.6.192/27 via the interface to your 2nd VM
- 40.181.220.192/27 via the interface to your 2nd VM
- 17.254.67.0/24 via the interface to your 2nd VM
- 94.170.40.152/30 via the IP address of your 2nd VM
- 122.194.109.176/29 via the IP address of your 2nd VM
- 64.185.116.0/25 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**

- 69.226.107.32/28 via the interface to your 2nd VM
- 98.59.118.32/27 via the IP address of your 2nd VM
- 70.156.104.192/26 via the interface to your 2nd VM
- 88.154.128.0/18 via the interface to your 2nd VM
- 42.127.148.30/31 via the interface to your 2nd VM
- 117.106.246.0/24 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**

- 25.75.0.0/16 via the IP address of your 2nd VM
- 120.51.223.0/24 via the IP address of your 2nd VM
- 90.111.64.0/19 via the interface to your 2nd VM
- 58.1.160.0/20 via the interface to your 2nd VM
- 119.113.0.0/18 via the IP address of your 2nd VM
- 51.177.0.0/16 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**

- 114.47.21.216/29 via the interface to your 2nd VM
- 21.20.192.0/19 via the IP address of your 2nd VM
- 48.11.223.0/24 via the interface to your 2nd VM
- 121.147.73.160/27 via the interface to your 2nd VM
- 40.92.250.104/30 via the interface to your 2nd VM
- 53.5.45.0/24 via the interface to your 2nd VM