

## Network Engineering 2019 Exercises - Unit 3

### 0.1 Netmask Calculation

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

82.127.224.0/20

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?**

99.79.70.212/30

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?**

0.0.0.0/2

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?**

64.92.0.0/14

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?**

0.0.0.0/5

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?**

0.0.0.0/0

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?**

55.0.176.0/20

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?**

120.7.186.100/31

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?**

92.0.0.0/6

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?**

45.46.0.0/17

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?**

60.0.0.0/7

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?**

11.16.43.192/30

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?**

118.98.0.0/15

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?**

81.8.0.0/13

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?**

21.142.136.224/30

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?**

31.80.0.0/12

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?**

97.127.49.176/30

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?**

21.51.42.10/31

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?**

104.0.0.0/5

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?**

0.0.0.0/2

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?**

103.176.124.0/24

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?**

72.0.0.0/5

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?**

62.0.0.0/7

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?**

79.223.108.0/23

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?**

52.125.128.0/17

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?**

112.118.141.72/29

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?**

108.192.0.0/10

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?**

59.23.112.0/20

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?**

31.0.0.0/8

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?**

7.133.230.128/25

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?**

66.64.0.0/10

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?**

29.49.31.0/26

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?**

41.137.0.0/16

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?**

6.0.0.0/9

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?**

4.0.0.0/6

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?**

11.154.250.202/31

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?**

31.152.0.0/14

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?**

14.64.0.0/11

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?**

31.0.0.0/8

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?**

96.0.0.0/3

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?**

91.67.11.122 netmask 255.192.0.0

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?**

69.182.252.224 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?**

100.166.27.180 netmask 255.255.255.224

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?**

43.56.255.199 netmask 255.248.0.0

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?**

12.239.115.132 netmask 255.128.0.0

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?**

57.92.225.71 netmask 255.224.0.0

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?**

89.158.231.51 netmask 255.248.0.0

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?**

115.28.207.133 netmask 255.255.255.240

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?**

8.242.73.93 netmask 255.255.255.252

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?**

26.36.85.165 netmask 255.255.224.0

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?**

7.188.1.4 netmask 255.255.0.0

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?**

0.138.215.178 netmask 224.0.0.0

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?**

127.85.102.31 netmask 255.255.254.0

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?**

5.121.5.174 netmask 255.255.240.0

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?**

109.21.172.191 netmask 255.255.0.0

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?**

115.4.197.87 netmask 255.255.255.128

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?**

103.65.61.186 netmask 255.255.254.0

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?**

16.101.73.236 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?**

57.138.56.243 netmask 255.255.240.0

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?**

80.33.147.123 netmask 255.255.254.0

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)?

110.93.48.61 netmask 192.0.0.0, PPP remote address 96.12.117.15,  
but not running

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

9.183.246.105 netmask 192.0.0.0

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 52.170.164.74/13 dev eth0; ip link set 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 the ifconfig command to setup interface eth0 with the following network settings (apply any options in the order listed)?

55.244.206.238 netmask 255.252.0.0, MTU = 1508, PPP remote address 65.27.180.48, TX queue length = 2498

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 127.97.79.230 netmask 255.255.0.0

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

27.164.128.247 netmask 255.255.240.0, MTU = 1904, PPP remote address 12.109.0.227, but not running, in promiscuous mode

Put your answer on a single line in `unit3/answers.txt`, with 65: at the beginning of the line, e.g., 65:`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 24.203.177.13 netmask 255.254.0.0 -arp`

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)?**

73.45.105.7 netmask 255.128.0.0, without ARP, TX queue length = 3039

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

`ip address add 11.213.71.96/31 dev eth0; ip link set eth0 down; ip link set dev eth0 txqueuelen 1012`

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

`ip address add 38.120.136.134/6 dev eth0; ip link set dev eth0 mtu 1897; ip link set dev eth0 arp off`

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

62.44.71.84 netmask 192.0.0.0, MTU = 2139, PPP remote address  
53.162.196.163, but not running, 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 `ip` command sequence to setup interface `eth0` with the following network settings (apply any options in the order listed)?**

44.7.30.54 netmask 255.254.0.0, MTU = 3234

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)?**

21.215.227.175 netmask 255.248.0.0

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)?**

84.74.174.18 netmask 255.224.0.0, but not running, TX queue length  
= 1689

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

`ip address add 119.221.158.165/17 dev eth0`

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 2.47.58.39 netmask 248.0.0.0 mtu 4074
```

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

```
127.202.50.10 netmask 224.0.0.0, MTU = 842, PPP remote address  
7.209.80.142
```

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

```
15.86.239.155 netmask 254.0.0.0, PPP remote address 81.75.3.224,  
without ARP
```

Put your answer on a single line in `unit3/answers.txt`, with 77: at the beginning of the line, e.g., 77: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 77.158.26.142/12 dev eth0; ip link set dev eth0 arp  
off
```

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

```
61.205.64.14 netmask 252.0.0.0, but not running, in promiscuous  
mode
```

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 `castle0`, that specifies an MTU of 1424 and MAC address `D6:37:11:B6:9A:5F`.
- A template called `castle1`, that specifies an MTU of 5888 and MAC address `D5:D3:A2:21:B7:98`.
- A template called `wealth2`, that specifies an MTU of 2287 and MAC address `83:C2:CA:91:E8:CF`.
- A template called `moths3`, that specifies an MTU of 7024 and MAC address `5E:0F:A3:E3:FE:19`.
- An interface named `wlan0`, with IPv4 settings configured by DHCP.
- An interface named `ftdi1`, with IPv4 address `71.21.253.116` and netmask `255.248.0.0`.
- An interface named `jam2`, with IPv4 address `42.14.4.161` and netmask `255.192.0.0`, and inherits the template `moths3`.
- An interface named `wlan3`, with IPv4 address `80.123.242.188` and netmask `255.255.255.248`, and inherits the template `castle1`.
- An interface named `jam4`, with IPv4 settings configured by DHCP.
- An interface named `wlan5`, with IPv4 address `122.202.132.207` and netmask `255.255.192.0`.
- An interface named `eth6`, with IPv4 settings configured by DHCP.

### 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 7506 and MAC address `BE:77:10:F5:B0:AB`.
- A template called `wealth1`, that specifies an MTU of 6500 and MAC address `08:A6:B9:4D:33:DE`.
- A template called `castle2`, that specifies an MTU of 7010 and MAC address `12:B2:ED:44:4F:C0`.

- An interface named `ftdi0`, with IPv4 address 56.2.65.61 and netmask 255.0.0.0, and inherits the template `castle2`.
- An interface named `ftdi1`, with IPv4 address 29.218.73.235 and netmask 255.224.0.0, 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 `ruins0`, that specifies an MTU of 2889 and MAC address 17:EB:AB:29:9E:99.
- A template called `ruins1`, that specifies an MTU of 5069 and MAC address 59:B7:2A:02:92:3F.
- A template called `moths2`, that specifies an MTU of 5170 and MAC address 2B:B2:80:8E:6D:4B.
- An interface named `wlan0`, with IPv4 settings configured by DHCP, and inherits the template `ruins1`.
- An interface named `ftdi1`, with IPv4 settings configured by DHCP.
- An interface named `jam2`, with IPv4 address 28.168.79.156 and netmask 255.192.0.0.

#### 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 4558 and MAC address 86:53:E2:8D:FD:0D.
- A template called `moths1`, that specifies an MTU of 6113 and MAC address 9B:AD:C8:3C:81:C8.
- An interface named `wlan0`, with IPv4 settings configured by DHCP.
- An interface named `ftdi1`, with IPv4 address 6.242.75.43 and netmask 255.255.224.0, and inherits the template `moths1`.
- An interface named `wlan2`, with IPv4 settings configured by DHCP.
- An interface named `ftdi3`, with IPv4 address 18.99.83.208 and netmask 248.0.0.0.

- An interface named jam4, with IPv4 settings configured by DHCP.
- An interface named jam5, with IPv4 address 91.245.80.39 and netmask 255.255.255.252.
- An interface named wlan6, with IPv4 address 115.205.115.145 and netmask 255.255.128.0, 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 moths0, that specifies an MTU of 4956 and MAC address 48:78:F9:FD:C1:8B.
- A template called ruins1, that specifies an MTU of 1173 and MAC address 70:8F:EF:52:D6:8C.
- A template called ruins2, that specifies an MTU of 936 and MAC address D6:D9:D7:A1:C8:53.
- A template called castle3, that specifies an MTU of 1561 and MAC address 89:8A:F2:EA:94:A5.
- An interface named eth0, with IPv4 settings configured by DHCP, and inherits the template castle3.
- An interface named eth1, with IPv4 address 38.3.241.47 and netmask 255.255.0.0, and inherits the template ruins2.
- An interface named eth2, with IPv4 settings configured by DHCP, and inherits the template ruins1.

### 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

- 18.198.181.0/24 via the IP address of your 2nd VM
- 112.7.109.0/25 via the IP address of your 2nd VM
- 37.34.37.180/31 via the interface to your 2nd VM
- 31.34.66.144/28 via the interface to your 2nd VM
- 69.23.78.96/27 via the IP address of your 2nd VM
- 101.60.157.128/25 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**

- 103.27.0.0/16 via the interface to your 2nd VM
- 97.95.8.0/21 via the IP address of your 2nd VM
- 114.191.128.0/17 via the IP address of your 2nd VM
- 122.57.0.0/16 via the IP address of your 2nd VM
- 104.192.247.206/31 via the interface to your 2nd VM
- 38.72.24.0/25 via the interface to your 2nd VM

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

- 11.132.128.0/18 via the IP address of your 2nd VM
- 45.216.140.34/31 via the interface to your 2nd VM
- 79.121.239.128/25 via the IP address of your 2nd VM
- 76.10.176.0/20 via the interface to your 2nd VM
- 57.168.82.0/23 via the interface to your 2nd VM
- 34.105.72.0/23 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**

- 72.177.0.0/16 via the interface to your 2nd VM
- 86.106.210.0/24 via the interface to your 2nd VM
- 93.118.30.0/23 via the IP address of your 2nd VM
- 14.197.240.0/21 via the IP address of your 2nd VM
- 56.93.138.0/24 via the IP address of your 2nd VM
- 18.230.182.128/25 via the interface to 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**

- 122.246.64.0/21 via the IP address of your 2nd VM
- 105.68.25.0/25 via the IP address of your 2nd VM
- 52.11.4.208/31 via the IP address of your 2nd VM
- 79.35.48.0/20 via the interface to your 2nd VM
- 58.114.128.0/17 via the interface to your 2nd VM
- 78.55.58.160/27 via the IP address of your 2nd VM