

## Network Engineering 2019 Exercises - Unit 3

### 0.1 Netmask Calculation

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

104.0.0.0/6

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?**

100.60.128.0/19

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?**

116.176.220.80/31

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?**

42.224.0.0/12

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?**

35.136.0.0/13

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?**

61.0.0.0/11

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?**

46.177.65.224/27

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?**

120.0.0.0/6

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?**

64.0.0.0/2

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?**

18.32.8.0/24

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?**

2.0.0.0/8

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?**

17.144.0.0/13

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?**

20.14.15.64/26

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?**

0.0.0.0/3

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?**

127.220.194.50/31

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?**

65.167.196.192/26

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?**

78.106.192.0/18

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?**

81.155.80.0/23

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?**

63.45.186.0/24

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?**

37.113.48.128/26

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?**

67.108.97.32/29

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?**

51.58.176.0/23

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?**

36.0.0.0/9

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?**

103.99.128.0/20

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?**

8.237.128.0/18

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?**

64.0.0.0/6

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?**

24.154.112.0/20

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?**

113.243.0.0/17

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?**

0.0.0.0/2

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?**

0.0.0.0/1

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?**

30.127.245.32/29

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?**

114.0.0.0/7

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?**

34.0.0.0/9

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?**

0.0.0.0/1

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?**

0.0.0.0/1

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?**

68.0.0.0/7

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?**

0.0.0.0/1

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?**

119.36.198.0/23

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?**

36.99.185.224/28

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?**

81.234.208.0/22

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?**

88.11.215.143 netmask 255.255.255.0

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?**

56.85.88.92 netmask 255.192.0.0

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?**

106.35.66.236 netmask 255.255.0.0

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?**

29.78.212.59 netmask 255.255.255.224

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?**

44.216.154.50 netmask 255.254.0.0

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?**

122.109.141.60 netmask 255.255.240.0

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?**

84.34.137.236 netmask 255.255.255.0

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?**

56.67.127.219 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?**

50.255.249.2 netmask 255.255.255.192

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?**

87.148.120.254 netmask 224.0.0.0

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?**

61.194.64.251 netmask 255.255.255.192

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?**

121.161.222.170 netmask 255.255.255.192

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?**

18.230.133.251 netmask 255.128.0.0

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?**

82.14.237.209 netmask 252.0.0.0

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?**

79.78.240.5 netmask 255.255.255.240

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?**

100.155.183.124 netmask 255.255.240.0

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?**

57.56.101.117 netmask 255.255.255.0

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?**

24.1.21.190 netmask 128.0.0.0

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?**

71.57.140.137 netmask 255.255.255.128

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?**

21.181.175.92 netmask 255.255.255.224

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

```
13.52.182.168 netmask 255.255.255.128
```

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 47.48.93.239/23 dev eth0; ip link set dev eth0 mtu
3997
```

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)?

```
95.94.127.208 netmask 255.0.0.0
```

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

```
ip address add 84.10.71.28/27 dev eth0; ip link set dev eth0 mtu
2649
```

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

```
59.15.211.121 netmask 224.0.0.0, PPP remote address 6.165.238.100,
TX queue length = 1534
```

Put your answer on a single line in unit3/answers.txt, with 64: at the beginning of the line, e.g., 64: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)?**

111.109.217.172 netmask 255.255.192.0, PPP remote address 76.4.168.175,  
TX queue length = 3932

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

74.42.195.21 netmask 255.255.255.240

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

112.85.165.245 netmask 255.224.0.0, but not running, TX queue  
length = 4029

Put your answer on a single line in `unit3/answers.txt`, with 67: at the beginning of the line, e.g., `67: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)?**

95.53.52.164 netmask 255.255.255.224, in promiscuous mode, TX  
queue length = 1318

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 31.191.232.224/25 dev eth0; ip link set dev eth0 down;  
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 ip command sequence equivalent to the following ifconfig command (apply any options in the order listed)?**

```
ifconfig eth0 28.160.197.250 netmask 255.224.0.0 mtu 3225
```

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

```
120.223.106.85 netmask 192.0.0.0, PPP remote address 55.158.33.181,  
without ARP, in promiscuous mode
```

Put your answer on a single line in `unit3/answers.txt`, with 71: at the beginning of the line, e.g., 71: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 61.209.80.148 netmask 255.255.224.0 down -arp
```

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

```
ifconfig eth0 86.67.141.21 netmask 255.128.0.0 promisc txqueuelen  
3944
```

Put your answer on a single line in `unit3/answers.txt`, with 73: at the beginning of the line, e.g., 73: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)?**

```
117.224.133.138 netmask 255.128.0.0, MTU = 1916, without ARP
```

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

```
ip address add 14.62.71.168/4 dev eth0; ip link set dev eth0 mtu
4399; ip link set dev eth0 arp off
```

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

```
ip address add 125.255.157.9/2 dev eth0; ip link set dev eth0 down
```

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 89.123.77.132 netmask 255.255.255.254 down
```

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

```
101.150.140.28 netmask 255.240.0.0, but not running, in promiscu-
ous mode
```

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)?**

```
35.15.133.108 netmask 255.255.255.224, but not running, without
ARP, 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 2842 and MAC address `C3:3E:05:F1:EC:D9`.
- A template called `moths1`, that specifies an MTU of 5419 and MAC address `B7:99:50:A3:E3:14`.
- An interface named `jam0`, with IPv4 settings configured by DHCP.
- An interface named `eth1`, with IPv4 settings configured by DHCP, and inherits the template `castle0`.
- An interface named `eth2`, 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 1625 and MAC address `69:E6:23:D0:1A:DA`.
- A template called `ruins1`, that specifies an MTU of 8698 and MAC address `7E:4C:7E:51:25:B3`.
- An interface named `ftdi0`, with IPv4 settings configured by DHCP, and inherits the template `ruins1`.
- An interface named `ftdi1`, with IPv4 address `100.66.149.153` and netmask `255.255.0.0`.
- An interface named `eth2`, with IPv4 address `92.73.234.238` and netmask `255.255.255.224`, 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 `wealth0`, that specifies an MTU of 7813 and MAC address `E9:E2:5E:53:60:AA`.
- A template called `castle1`, that specifies an MTU of 2606 and MAC address `D0:85:FA:54:D8:35`.

- A template called `wealth2`, that specifies an MTU of 4908 and MAC address `66:82:64:98:D9:A8`.
- A template called `moths3`, that specifies an MTU of 6133 and MAC address `65:70:5A:8A:3F:62`.
- A template called `wealth4`, that specifies an MTU of 7029 and MAC address `44:DE:7C:A5:89:4E`.
- An interface named `wlan0`, with IPv4 address `104.78.237.89` and netmask `255.255.224.0`.
- An interface named `eth1`, with IPv4 settings configured by DHCP, and inherits the template `moths3`.
- An interface named `eth2`, with IPv4 settings configured by DHCP.
- An interface named `eth3`, with IPv4 settings configured by DHCP, and inherits the template `wealth0`.
- An interface named `ftdi4`, with IPv4 settings configured by DHCP, and inherits the template `wealth4`.
- An interface named `ftdi5`, with IPv4 settings configured by DHCP, and inherits the template `wealth0`.
- An interface named `ftdi6`, with IPv4 address `103.167.11.105` and netmask `255.254.0.0`, and inherits the template `wealth0`.

#### 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 4292 and MAC address `07:1F:B8:6D:11:34`.
- A template called `ruins1`, that specifies an MTU of 6129 and MAC address `EF:4F:89:D4:B6:63`.
- A template called `ruins2`, that specifies an MTU of 5089 and MAC address `C7:E4:24:83:67:D8`.
- A template called `ruins3`, that specifies an MTU of 4090 and MAC address `12:EC:45:39:02:D8`.
- An interface named `wlan0`, with IPv4 address `86.123.213.10` and netmask `255.255.255.0`, and inherits the template `ruins1`.
- An interface named `wlan1`, with IPv4 settings configured by DHCP, and inherits the template `ruins1`.

- An interface named `ftdi2`, with IPv4 settings configured by DHCP, and inherits the template `ruins2`.
- An interface named `ftdi3`, with IPv4 settings configured by DHCP.
- An interface named `ftdi4`, with IPv4 settings configured by DHCP.
- An interface named `wlan5`, with IPv4 settings configured by DHCP.
- An interface named `jam6`, with IPv4 settings configured by DHCP, and inherits the template `ruins1`.

#### 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 4212 and MAC address `5E:6E:03:28:DA:4C`.
- A template called `moths1`, that specifies an MTU of 7710 and MAC address `19:ED:D2:D3:99:4C`.
- A template called `ruins2`, that specifies an MTU of 4187 and MAC address `00:22:56:9A:D4:18`.
- An interface named `wlan0`, with IPv4 address `74.149.84.254` and netmask `240.0.0.0`, and inherits the template `moths1`.
- An interface named `wlan1`, with IPv4 address `82.4.161.145` and netmask `252.0.0.0`, and inherits the template `ruins2`.
- An interface named `wlan2`, with IPv4 address `94.116.196.217` and netmask `255.255.248.0`, and inherits the template `moths0`.

### 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

- `28.12.160.0/19` via the interface to your 2nd VM
- `123.207.128.0/18` via the IP address of your 2nd VM
- `99.222.0.0/17` via the IP address of your 2nd VM
- `32.248.142.164/30` via the IP address of your 2nd VM
- `79.163.39.192/26` via the IP address of your 2nd VM
- `75.221.83.252/30` 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**

- 76.251.141.48/29 via the IP address of your 2nd VM
- 37.125.64.0/18 via the IP address of your 2nd VM
- 115.32.144.0/22 via the interface to your 2nd VM
- 15.168.0.0/16 via the interface to your 2nd VM
- 21.101.0.0/16 via the IP address of your 2nd VM
- 22.142.254.22/31 via the interface to your 2nd VM

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

- 121.52.211.0/24 via the interface to your 2nd VM
- 83.3.134.208/28 via the IP address of your 2nd VM
- 78.158.251.12/30 via the IP address of your 2nd VM
- 37.134.208.0/21 via the interface to your 2nd VM
- 72.120.20.0/22 via the IP address of your 2nd VM
- 55.70.164.0/22 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**

- 45.157.245.124/30 via the IP address of your 2nd VM
- 87.73.0.0/16 via the IP address of your 2nd VM
- 12.252.115.32/27 via the IP address of your 2nd VM
- 121.6.48.0/22 via the interface to your 2nd VM
- 74.211.128.0/18 via the interface to your 2nd VM
- 28.212.128.0/21 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**

- 68.226.224.0/19 via the IP address of your 2nd VM
- 44.124.98.192/28 via the IP address of your 2nd VM
- 51.83.124.236/30 via the IP address of your 2nd VM
- 108.44.252.128/28 via the IP address of your 2nd VM
- 67.248.225.160/27 via the interface to your 2nd VM
- 94.77.160.0/19 via the interface to your 2nd VM