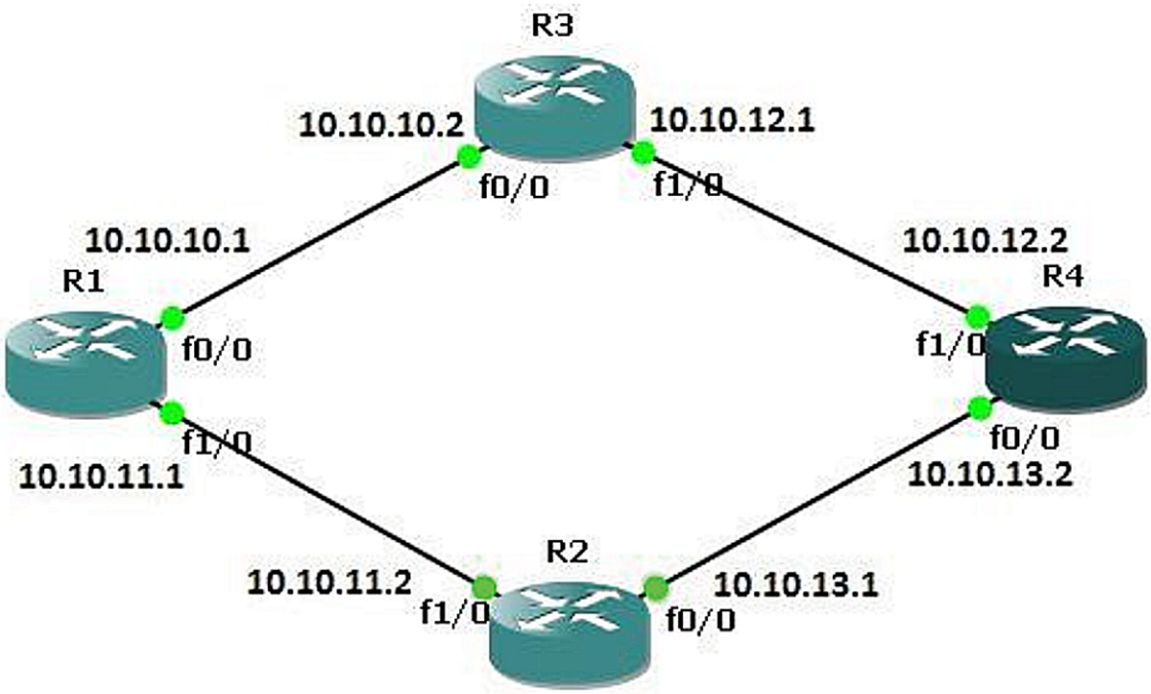
Computer Networks (CS303)

Assignment - 7

U19CS012

1) Create the below Network, which follows **Static Routing**.

Static routing is a routing type in which a **Network Administrator** configures the routes into the Routing Table **Manually** to be used by the Router to send packets to a destination network.



[Correction in Image **f1/0** -> **f0/1**]

Observations from Image

1.) There are **4** Routers with Configuration of

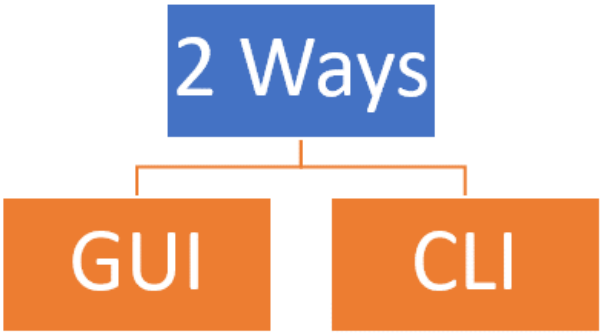
- ✓ **f0/0** {Fast Ethernet 0/0} & **f1/0** {Fast Ethernet 0/1}

2.) We can use Router **2811** [Since it has Fast Ethernet Ports]

3.) The Data in the Image can be converted in Tabular Form as Shown Below:

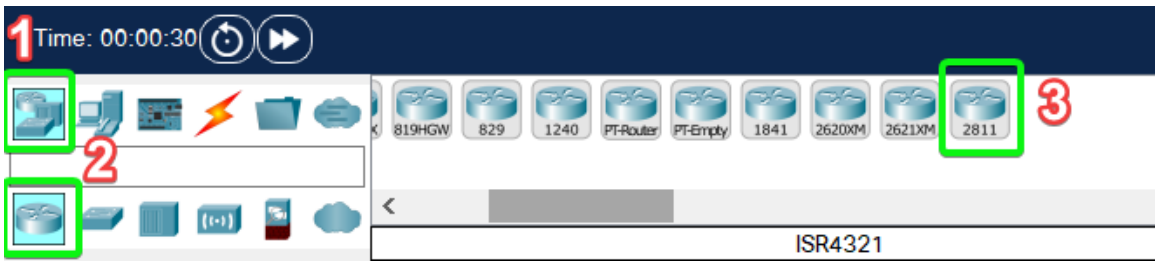
Router	Fast Ethernet 0/0	Fast Ethernet 0/1
R1	10.10.10.1	10.10.11.1
R2	10.10.13.1	10.10.11.2
R3	10.10.10.2	10.10.12.1
R4	10.10.13.2	10.10.12.2

Create the same network in two different ways:

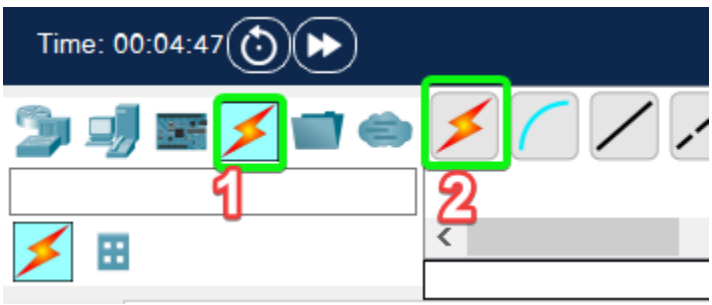


Configuring IP Address from GUI {Graphical User Interface}

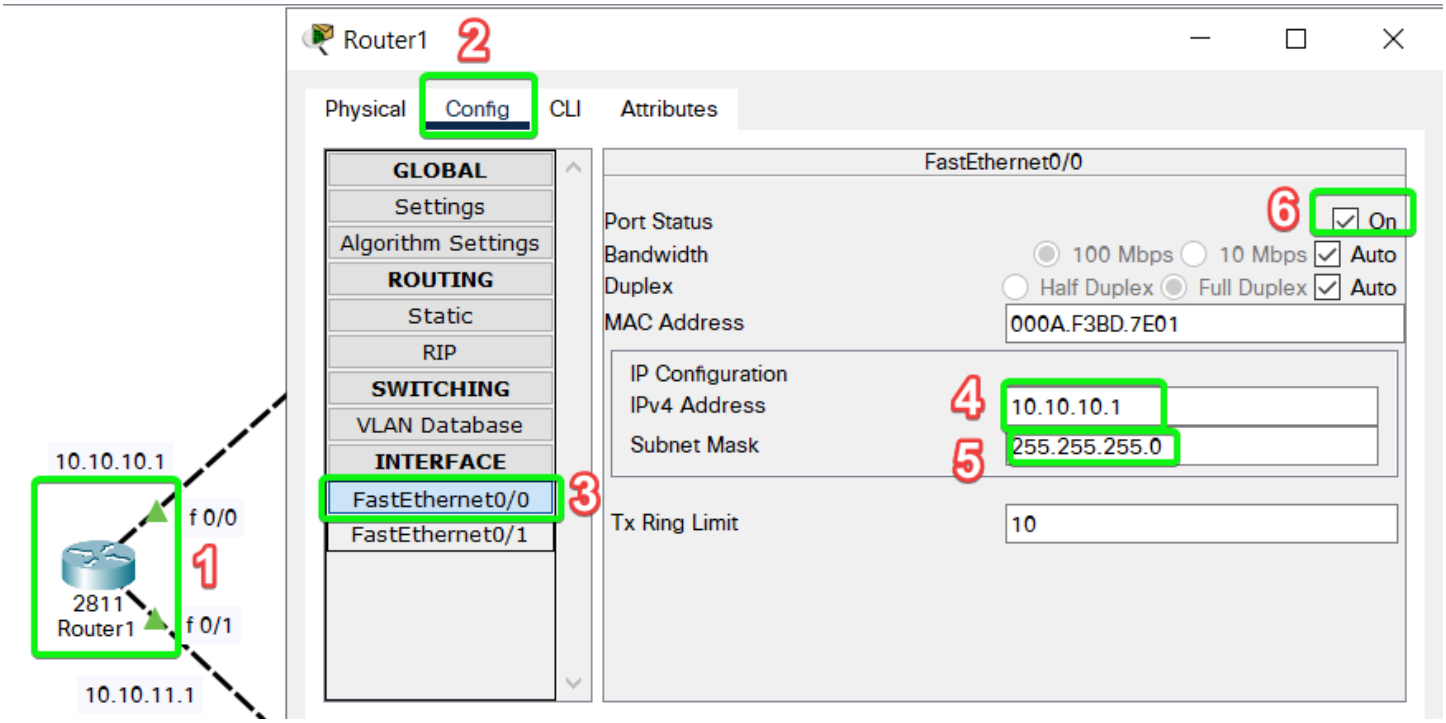
Step 1: In Network Devices > Routers > **Router 2811**, Select 4 Routers and arrange them as shown in Image.



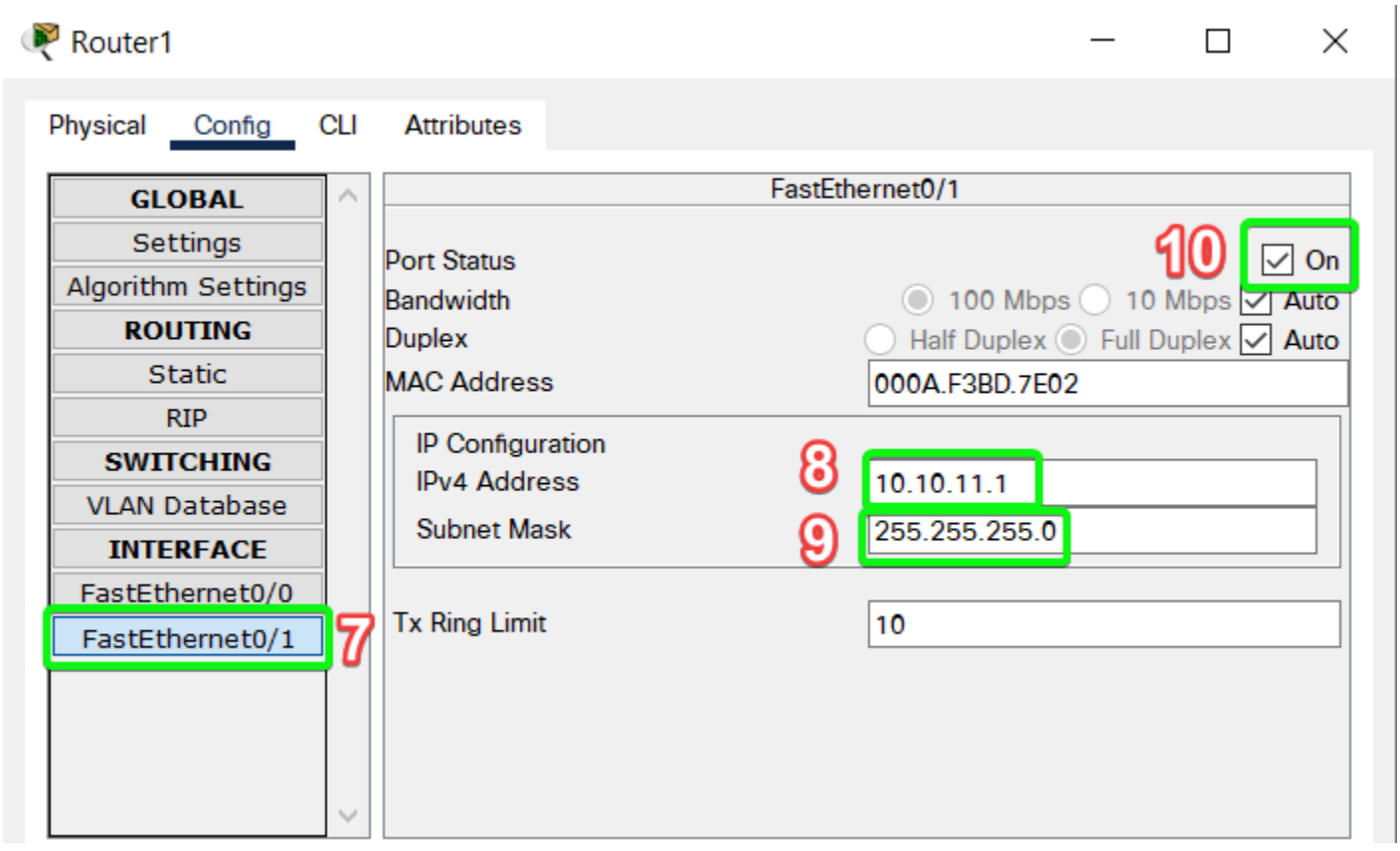
Step 2: Connect them Using "Automatically Chosen Connection Type" as shown in image.



Step 3: Configure the IPv4 Address of Router 1 as Shown Below [10 Steps]



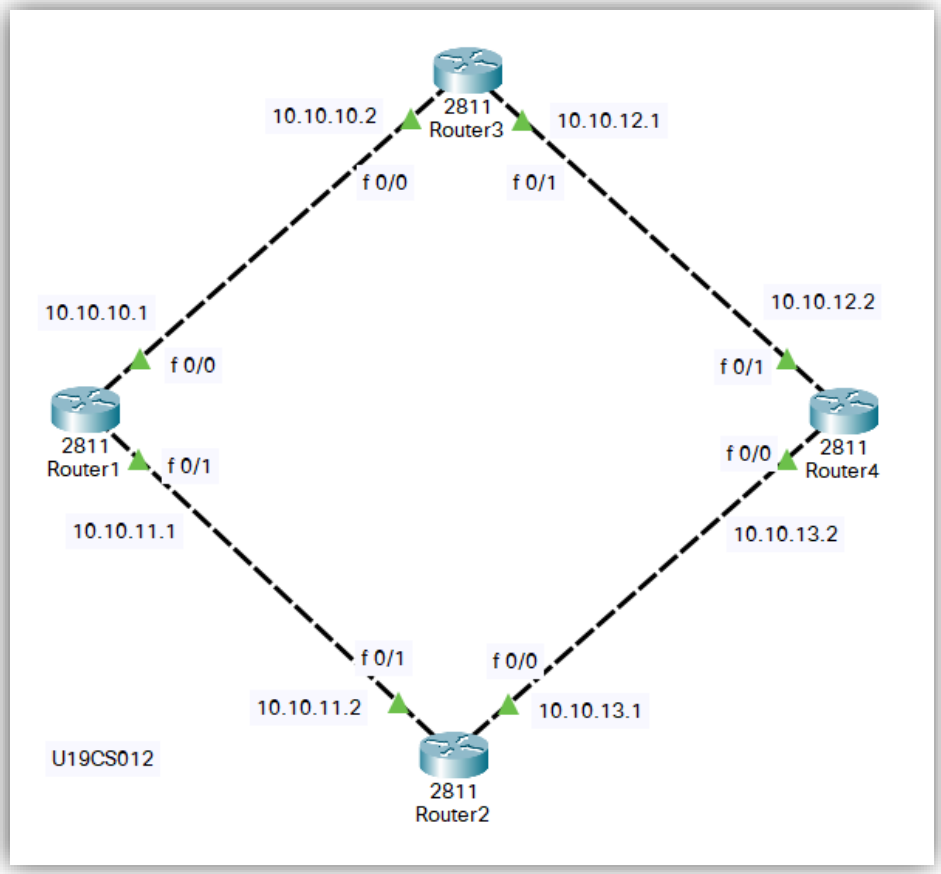
Now, Configure for Fast Ethernet 0/1 as shown below:



Step 4: Repeat Step 3 for Router 2, 3 & 4.

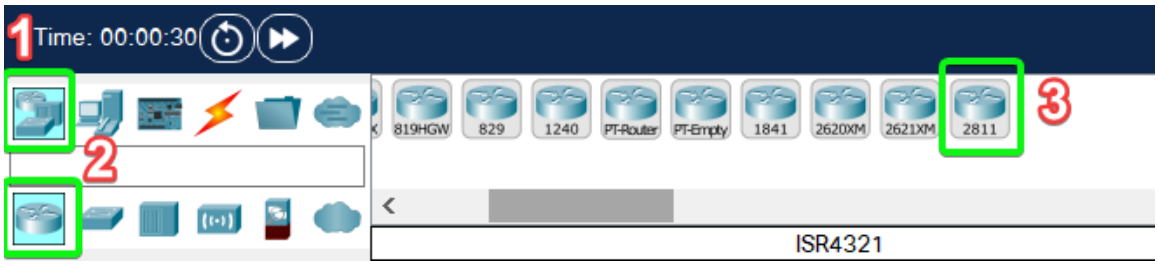
Step 5: Label Each Node in the Network as Shown in Image.

Final Network Diagram after Labelling

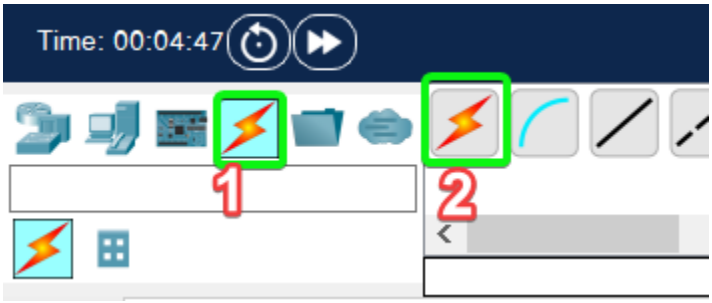


Command line

Step 1: In Network Devices > Routers > **Router 2811**, Select 4 Routers and arrange them as shown in Image.



Step 2: Connect them Using "Automatically Chosen Connection Type" as shown in image.



Step 3: Follow the Given below Steps to Configure the Router using CLI.

1.) Press Return [Enter Key]

```
Press RETURN to get started.
```

2.) Write "`enable`" {Router> -> Router#}

```
Router>enable
Router#
```

3.) Write "`configure terminal`" {Router# -> Router(config)#}

```
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#
```

4.) Write "`interface FastEthernet 0/0`"

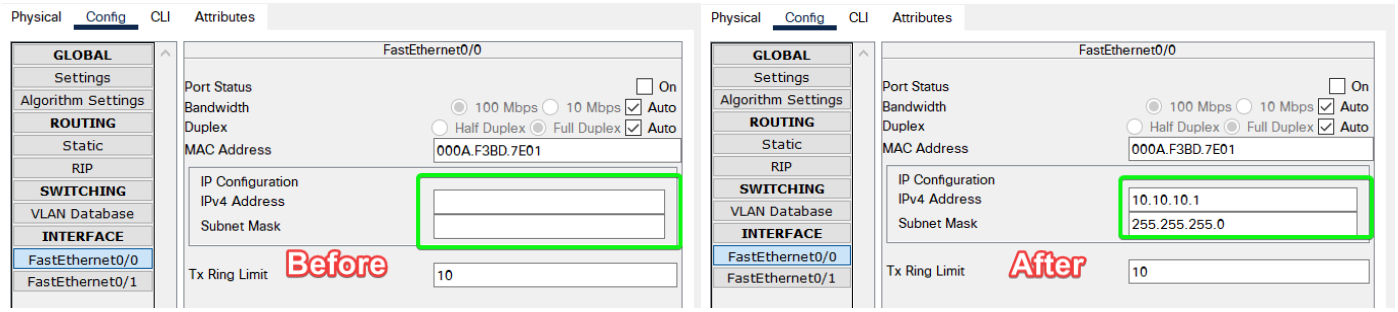
```
Router(config)#interface FastEthernet 0/0
Router(config-if)#
```

5.) To Configure IP Address of Fast Ethernet 0/0, using CLI,

`ip address  <IPv4_ADDRESS_HERE> <SUBNET_MASK_HERE>`

Eg: ip address 10.10.10.1 255.255.255.0

```
Router(config-if)#ip address 10.10.10.1 255.255.255.0
Router(config-if)#
```

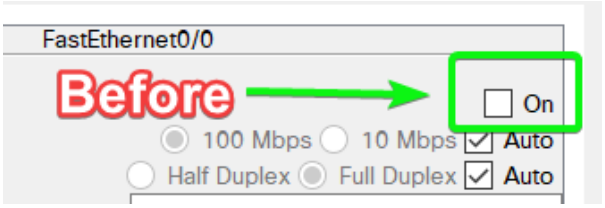


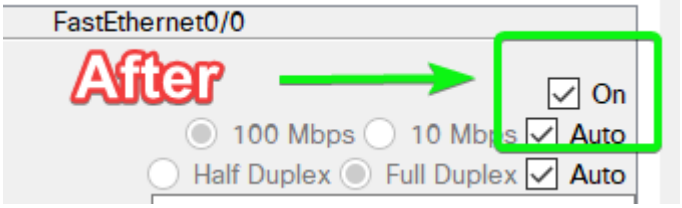
6.) Write "`no shutdown`" to make the Fast Ethernet 0/0 Port On.

```
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed
state to up
```





7.) Write "`interface FastEthernet 0/1`"

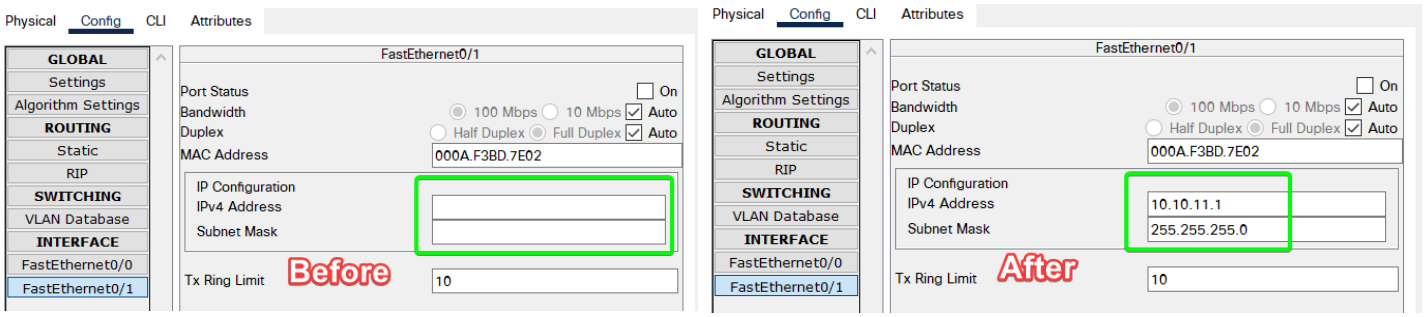
```
Router(config-if)#interface FastEthernet 0/1
Router(config-if)#
```

8.) To Configure IP Address of Fast Ethernet 0/1, using CLI,

`ip address  <IPv4_ADDRESS_HERE> <SUBNET_MASK_HERE>`

Eg: ip address 10.10.11.1 255.255.255.0

```
Router(config-if)#ip address 10.10.11.1 255.255.255.0
Router(config-if)#
```

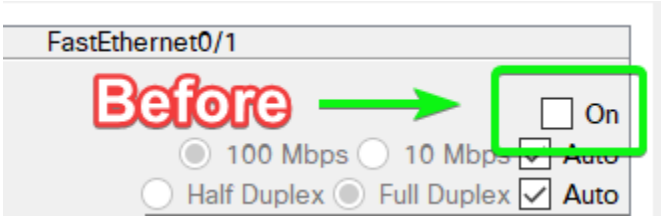


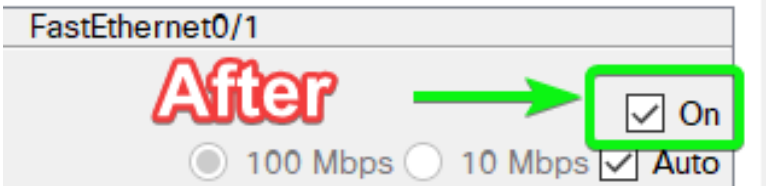
9.) Write "`no shutdown`" to make the Fast Ethernet 0/1 Port On.

```
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed
state to up
```





10.) Write "exit" {To Exit from CLI Mode}

Step 4: Repeat Step 3 for Router 2, 3 & 4.

Advantages of Static Routing

- ✓ It provides **Easy** routing table **Maintenance** in networks.
- ✓ Static routing consumes **Less Bandwidth** when compared to dynamic routing as no CPU cycles are-used in route calculation and communication.
- ✓ Because static routes do not advertise their route over the network, it results in **better Network Security**.

Dis-Advantages of Static Routing

- ✓ In large networks, **configuring and adding** a static route to the routing table is **very difficult**.
- ✓ Configuring static routes requires **background knowledge** of the network topology by the network administrator.
- ✓ Static route is **error-prone**.

[Reference: https://www.section.io/engineering-education/understanding-static-dynamic-routing/]

SUBMITTED BY:

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