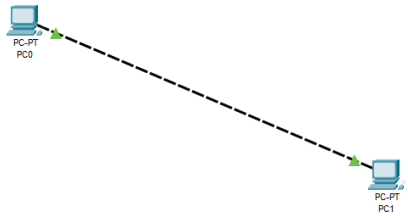
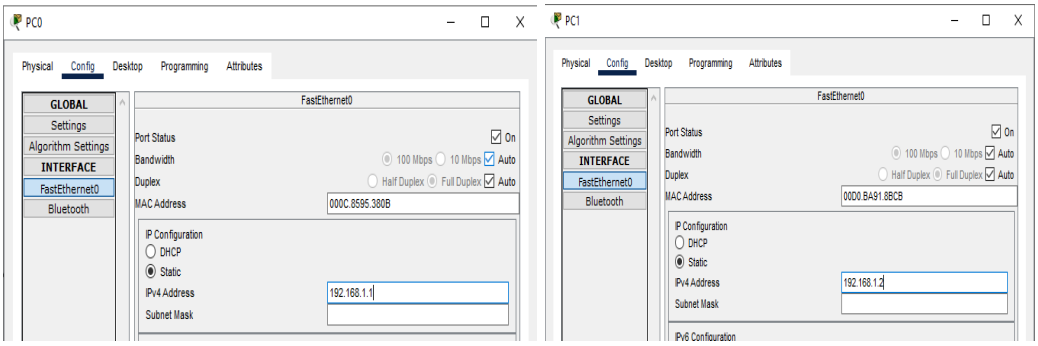
Computer Networking Practicals

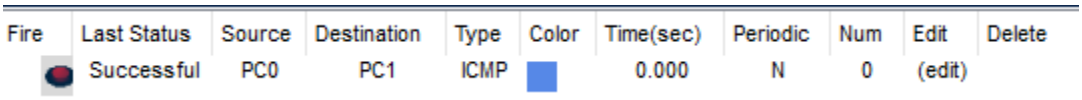
1. Basic network commands and network configuration commands:
    a.
2. To Study and perform PC to PC communication.
   Steps:
    a. Drag and drop 2 PCs and connect them through a wire.

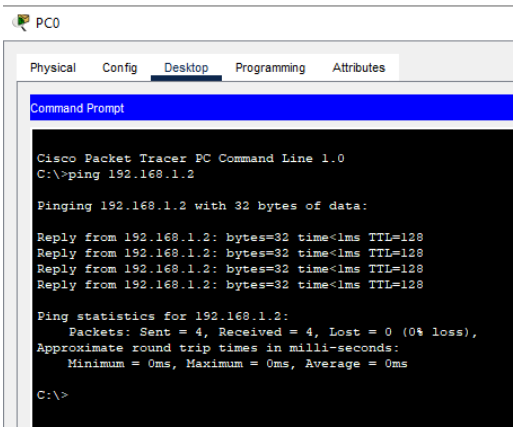


b. Double click on the PCs and assign them a static IP address.

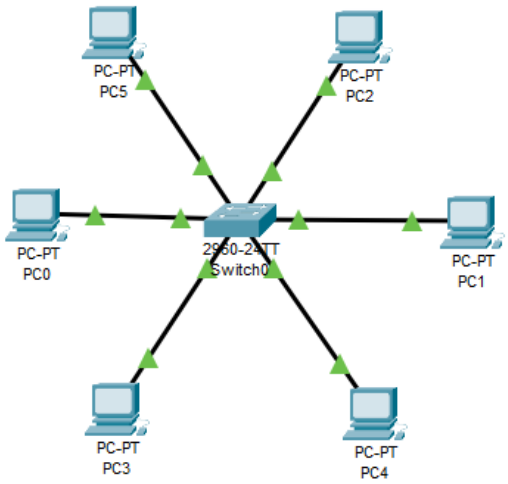


c. Try sending a packet from one to another or run a ping command in cmd.





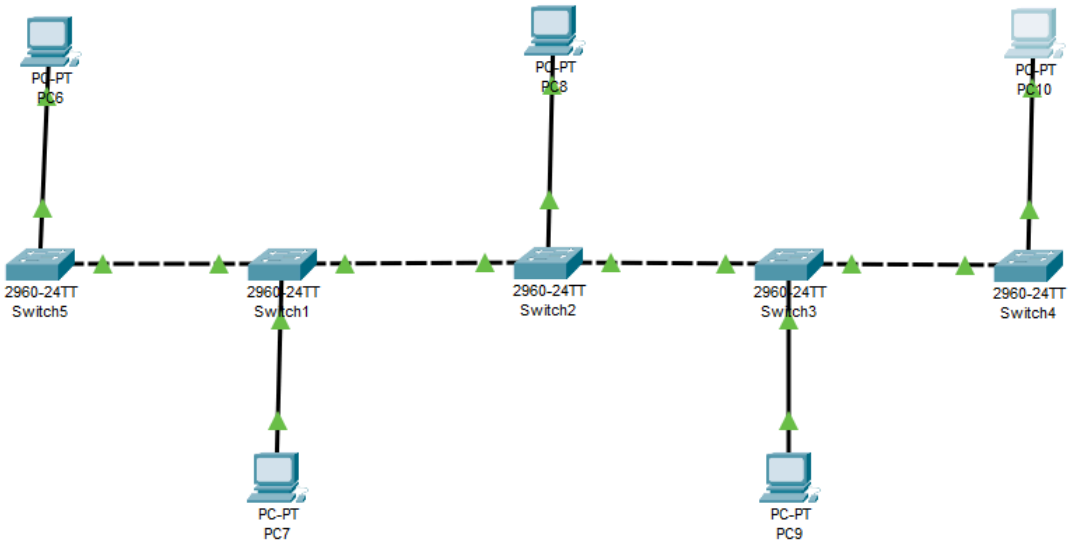
3. To create a star topology using hubs and switches.
    a. ADD 6 PCs and connect them in a star manner with a central switch



    b. Configure IP addresses for all devices
    c. Try sending packets from one PC to another.

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC5	PC4	ICMP		0.000	N	1	(edit)	
	Failed	PC0	PC2	ICMP		0.000	N	2	(edit)	
	Successful	PC4	PC3	ICMP		0.000	N	3	(edit)	
	Successful	PC0	PC4	ICMP		0.000	N	4	(edit)	

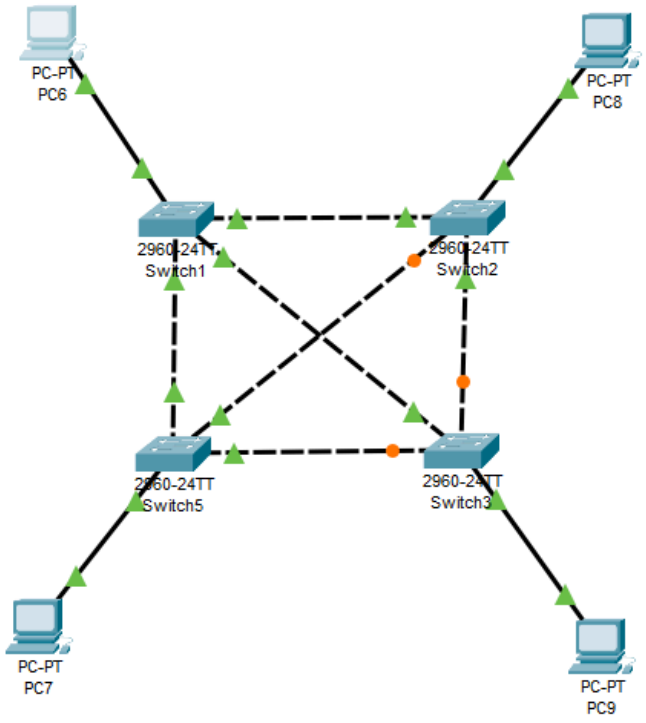
4. To create bus, ring, tree, hybrid and Mesh topologies.
    a. BUS topology:



Testing after configuring IP addresses:

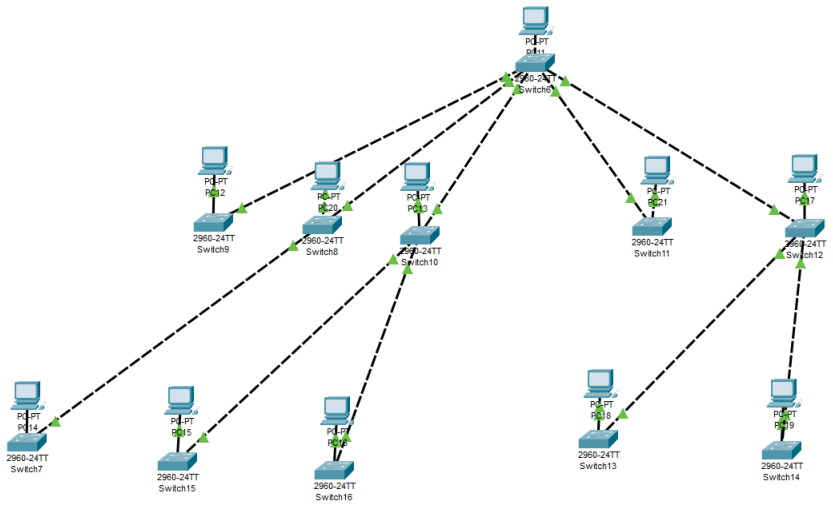
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC6	PC7	ICMP		0.000	N	0	(edit)	
	Successful	PC7	PC10	ICMP		0.000	N	1	(edit)	
	Successful	PC9	PC6	ICMP		0.000	N	2	(edit)	
	Successful	PC6	PC10	ICMP		0.000	N	3	(edit)	

b. Ring topology: Setup and configuring PCs and Switch

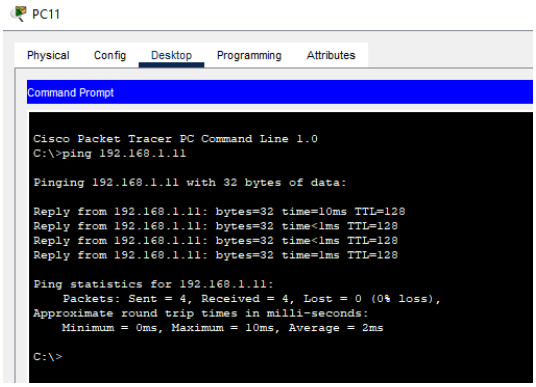


Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC6	PC9	ICMP		0.000	N	4	(edit)	
	Successful	PC8	PC7	ICMP		0.000	N	5	(edit)	
	Successful	PC6	PC7	ICMP		0.000	N	6	(edit)	
	Successful	PC8	PC9	ICMP		0.000	N	7	(edit)	

c. Tree Topology:



Connect every PC to a unique switch and connect them in the above design scheme and configure IP addresses for each PC.

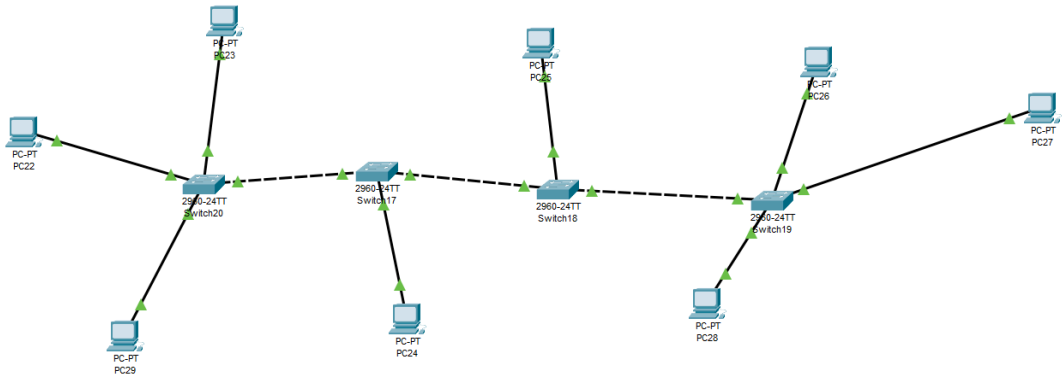


Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC11	PC16	ICMP		0.000	N	0	(edit)	
	Successful	PC17	PC18	ICMP		0.000	N	1	(edit)	
	Successful	PC12	PC18	ICMP		0.000	N	2	(edit)	
	Successful	PC14	PC17	ICMP		0.000	N	3	(edit)	

d. Hybrid topology:

A hybrid network topology is an interconnection of two or more basic network topologies, each of which contains its own nodes. The resulting topology will exhibit characteristics of all the constituent topologies, thereby limiting the inherent weaknesses of each topology.

Setup and design schema:



Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC22	PC26	ICMP		0.000	N	0	(edit)	
	Successful	PC23	PC24	ICMP		0.000	N	1	(edit)	
	Successful	PC27	PC29	ICMP		0.000	N	2	(edit)	

5. Perform initial switch configuration.

   Open CLI of a switch in cisco packet tracer simulator and use below code snippets to perform some basic initial configurations.

   a. Hostname:

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname student
student(config)#exit
student#
%SYS-5-CONFIG_I: Configured from console by console
```

   b. Password:

```
student#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
student(config)#line console 0
student(config-line)#password Ramanujan123
student(config-line)#exit
student(config)#exit
student#
%SYS-5-CONFIG_I: Configured from console by console
```

   c. Interface configuration:

```
Switch(config)# interface FastEthernet 0/1
Switch(config-if)# speed 100  (Optional - Depending on model)
Switch(config-if)# duplex full  (Optional - Depending on model)
Switch(config-if)# description Connection to PC0
```

6. Perform an initial router configuration.

   a. Interface configuration:

```
Router(config)# interface FastEthernet 0/0
Router(config-if)# ip address 192.168.1.1 255.255.255.0
Router(config-if)# no shutdown
```

b. Hostname:

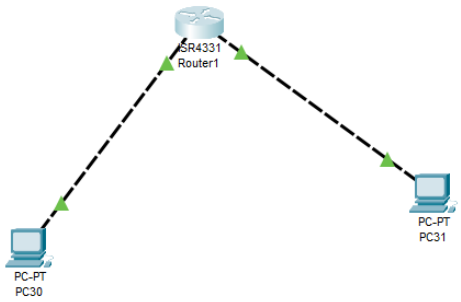
```
Router>enable
Router#confirgure terminal
                ^
% Invalid input detected at '^' marker.

Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname ramanujan
ramanujan(config)#exit
ramanujan#
%SYS-5-CONFIG_I: Configured from console by console
```

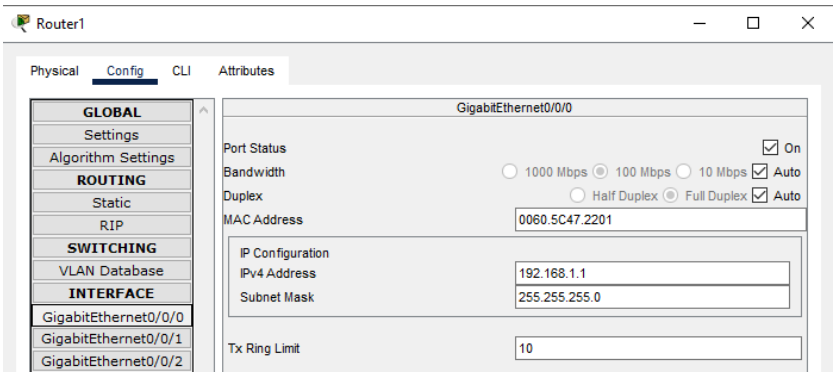
c. Password:

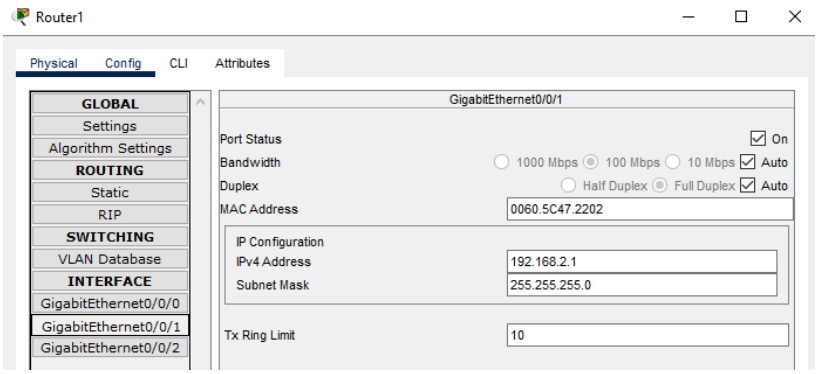
```
ramanujan#config t
Enter configuration commands, one per line.  End with CNTL/Z.
ramanujan(config)#enable secret RC123
ramanujan(config)#
```

7. To implement connection between devices using a router.
   a. Connect 2 PCs to a router and configure IP addresses for both PCs

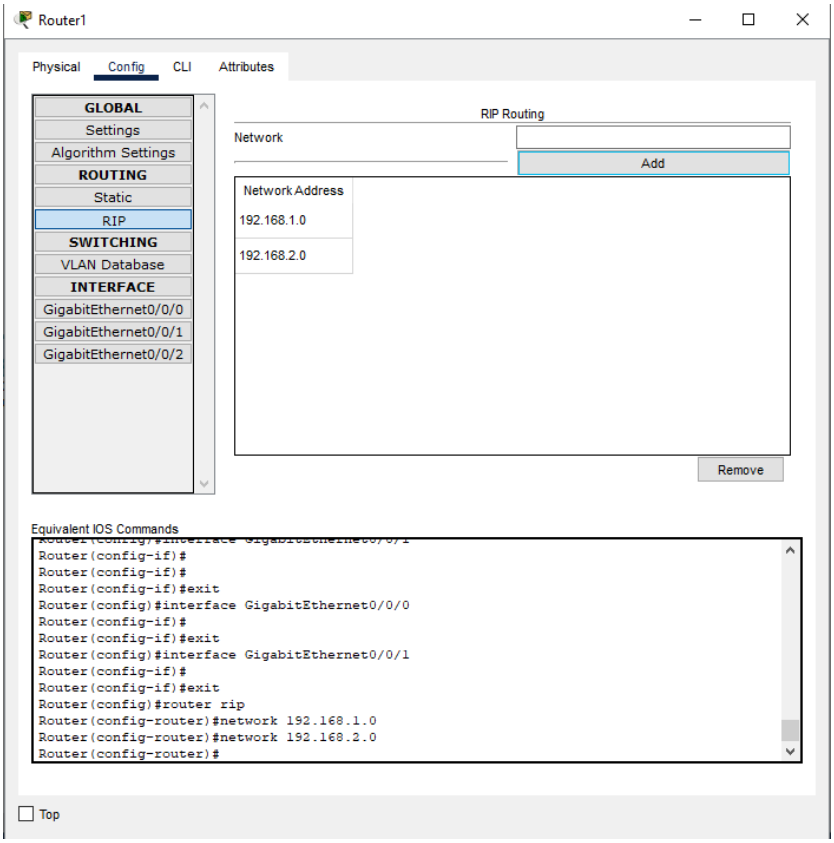


b. Configure the router and enter IP addresses for both ports:





c. Configure RIP for the router:



d. Testing via packet transfer: