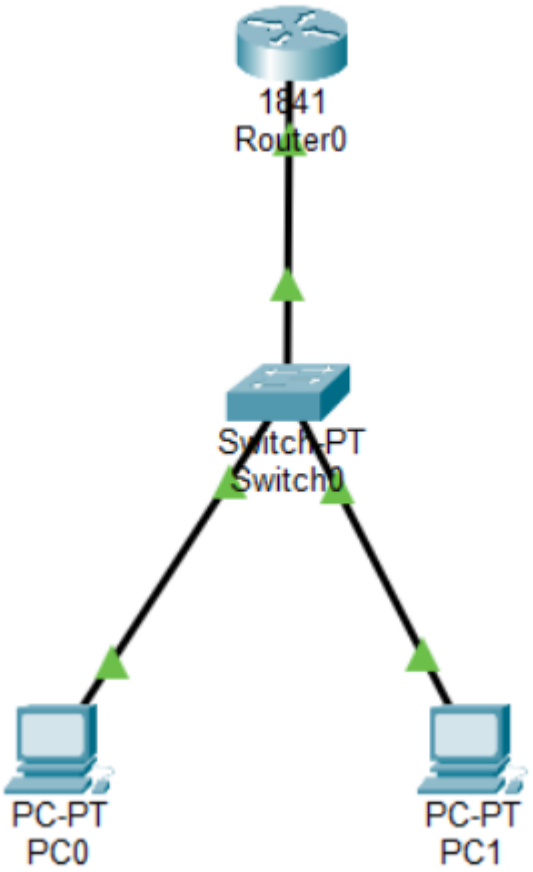
Q. Demonstrate DHCP Server in Cisco Packet Tracer.

Aim: To configure a router as DHCP server to automatically assign IP addresses to clients.
Devices Required:
1 Router (1841 or any model)
1 Switch (2960 or any model)
2-4 PCs
Connections:
Router FastEthernet0/0 to Switch FastEthernet0/1 (Straight-through cable)
PC0 to Switch FastEthernet0/2 (Straight-through cable)
PC1 to Switch FastEthernet0/3 (Straight-through cable)
Topology :



Code :
Router Configuration Commands:
Router>enable
Router#configure terminal
Router(config)#hostname DHCP-Router
DHCP-Router(config)#interface FastEthernet0/0

DHCP-Router(config-if)#ip address 10.0.0.1 255.255.255.0

DHCP-Router(config-if)#no shutdown
DHCP-Router(config-if)#exit

DHCP Pool Configuration:
DHCP-Router(config)#ip dhcp pool STUDENT_NETWORK
DHCP-Router(dhcp-config)#network 10.0.0.0 255.255.255.0
DHCP-Router(dhcp-config)#default-router 10.0.0.1
DHCP-Router(dhcp-config)#dns-server 8.8.8.8
DHCP-Router(dhcp-config)#exit

Exclude IP Addresses:
DHCP-Router(config)#ip dhcp excluded-address 10.0.0.1 10.0.0.10
DHCP-Router(config)#exit
DHCP-Router#copy running-config startup-config

PC Configuration:
On each PC, go to Desktop tab → IP Configuration
Select DHCP option
Verification cammand :
On Router:
DHCP-Router#show ip dhcp pool
DHCP-Router#show ip dhcp binding
DHCP-Router#show ip interface brief

On both PCs (Command Prompt):
C:\>ipconfig
C:\>ipconfig /all
C:\>ping 10.0.0.1

Output Results:

PC0 - ip config:

```
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..: collegelab.local
   Link-local IPv6 Address.....: FE80::250:FFF:FEBC:55D2
   IPv6 Address.....: ::
   IPv4 Address.....: 10.0.0.11
   Subnet Mask.....: 255.255.255.0
   Default Gateway.....: ::
                                     10.0.0.1
```

PC1 - ip config:

```
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..: collegelab.local
   Link-local IPv6 Address.....: FE80::20C:85FF:FE14:5DE7
   IPv6 Address.....: ::
   IPv4 Address.....: 10.0.0.12
   Subnet Mask.....: 255.255.255.0
   Default Gateway.....: ::
                                     10.0.0.1
```

Router - DHCP Bindings (WORKING COMMAND):

```
DHCP-router#show ip dhcp binding
IP address       Client-ID/              Lease expiration        Type
                 Hardware address
10.0.0.11        0050.0FBC.55D2           --                     Automatic
10.0.0.12        000C.8514.5DE7           --                     Automatic
```

Router - DHCP Pool Status (WORKING COMMAND):

```
DHCP-router#show ip dhcp pool

Pool STUDENT_NETWORK :
 Utilization mark (high/low)    : 100 / 0
 Subnet size (first/next)       : 0 / 0
 Total addresses                : 254
 Leased addresses               : 2
 Excluded addresses             : 1
 Pending event                  : none

 1 subnet is currently in the pool
 Current index        IP address range                    Leased/Excluded/Total
 10.0.0.1             10.0.0.1         - 10.0.0.254        2    / 1     / 254
```

Router - Interface Status:

```
DHCP-router#show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
FastEthernet0/0        10.0.0.1        YES manual up                    up
FastEthernet0/1        unassigned      YES unset  administratively down down
Serial0/0/0            unassigned      YES unset  administratively down down
Serial0/0/1            unassigned      YES unset  administratively down down
Vlan1                  unassigned      YES unset  administratively down down
```

Connectivity Test - PC0 to Router:

```
C:\>ping 10.0.0.1

Pinging 10.0.0.1 with 32 bytes of data:

Reply from 10.0.0.1: bytes=32 time<1ms TTL=255
Reply from 10.0.0.1: bytes=32 time<1ms TTL=255
Reply from 10.0.0.1: bytes=32 time<1ms TTL=255
Reply from 10.0.0.1: bytes=32 time<1ms TTL=255

Ping statistics for 10.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Conclusion: The DHCP server has been successfully configured on the router using commands compatible with Cisco Packet Tracer.