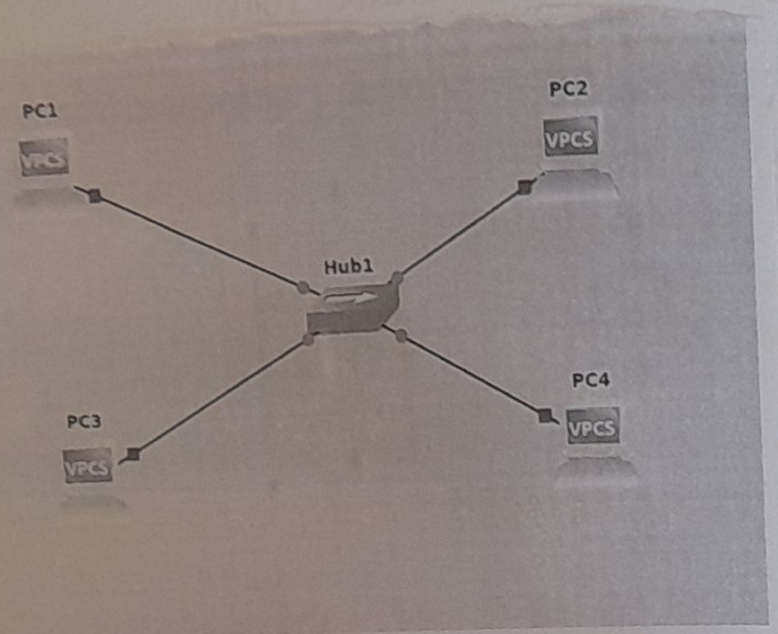
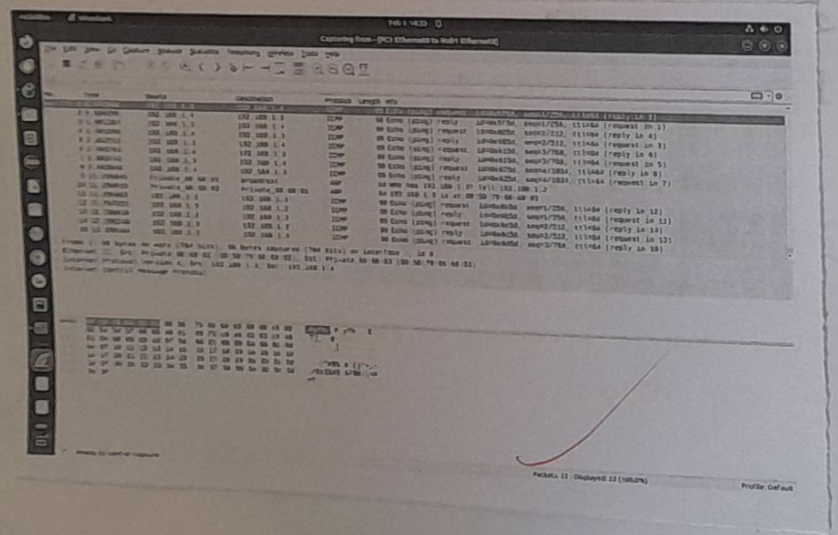
Expt. No. ..... Date 02/01/24

BASIC CONNECTIONS

Procedure :-

1) Create a new project
2) Drag UPCS to the screen.
3) Connect the two pcs with the cabels
4) label it
5) Click on start and press ok. nods should appear as green
6) Right click on UPCS → Open console (It will then open to terminal)
7) Type ip <ipaddress>|24
output:- checking for duplicate address
8) Similarly create for all the pc with different ip address.
i.e PC2 > show ipaddress of PC2
PC2 > ping <ipaddress of PC1>





Expt. No. 5 Date 19/01/24

HUB

Aim:- To implement computer network using Hub

Procedure:-

1) Create a new project
2) Drag Ethernet hub
3) Connect 3 VPCS to hub
4) Label the PCS
5) Click on start
6) Right click on each PCS and open console will get terminal.

Ex:- PC1>ip <ipaddress>/24

Similarly for all pcs we need to apply the abare procedure.

Ping all the pcs by using the below command

ping ipaddress

7) show ip
8) Right click on any one of the link -> show capture -> click on start
9) Open terminal of any PCs and type ping <ipaddress> of other PC
10) Open the new terminal and type PC1> ip <ip-address> 192.168.1.254

3/1/24

Expt. No. 5 Date 9/01/24

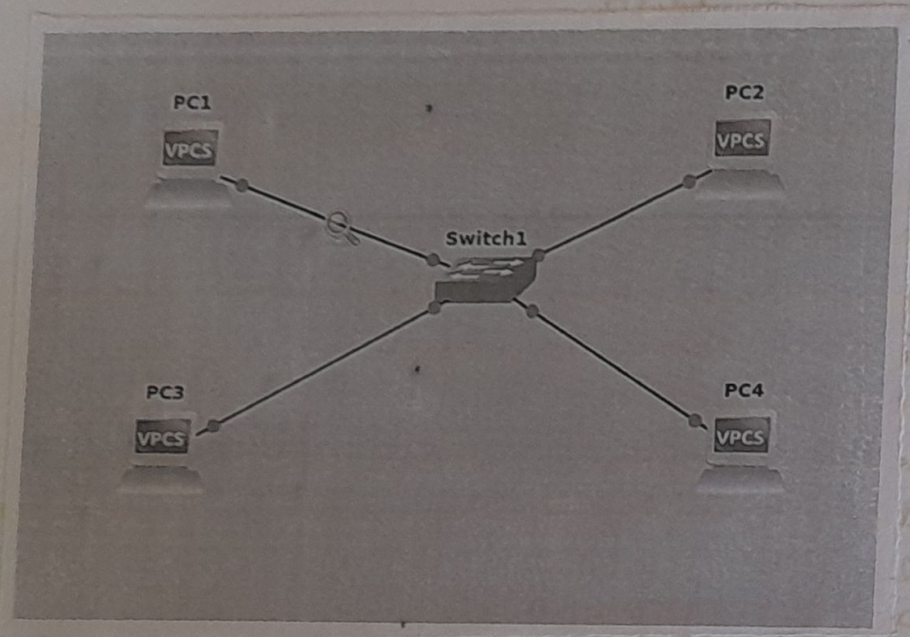
SWITCH

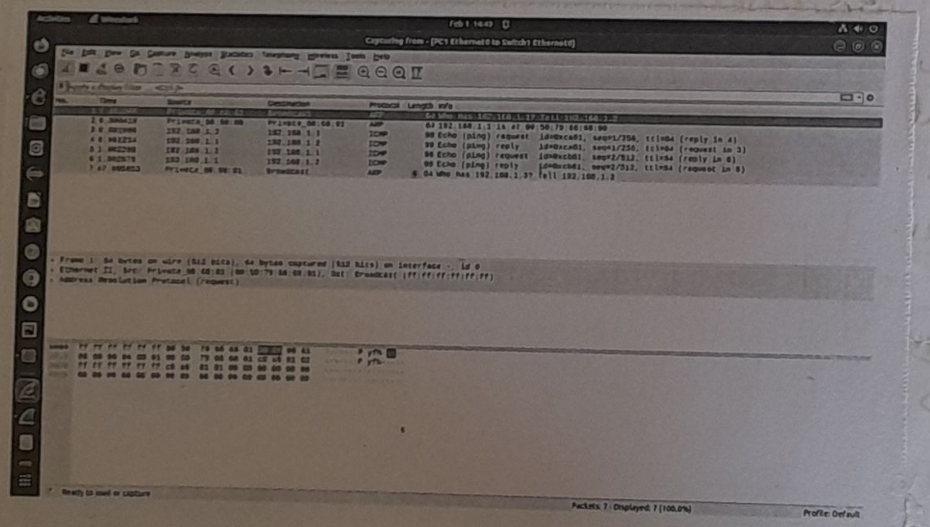
Aim:

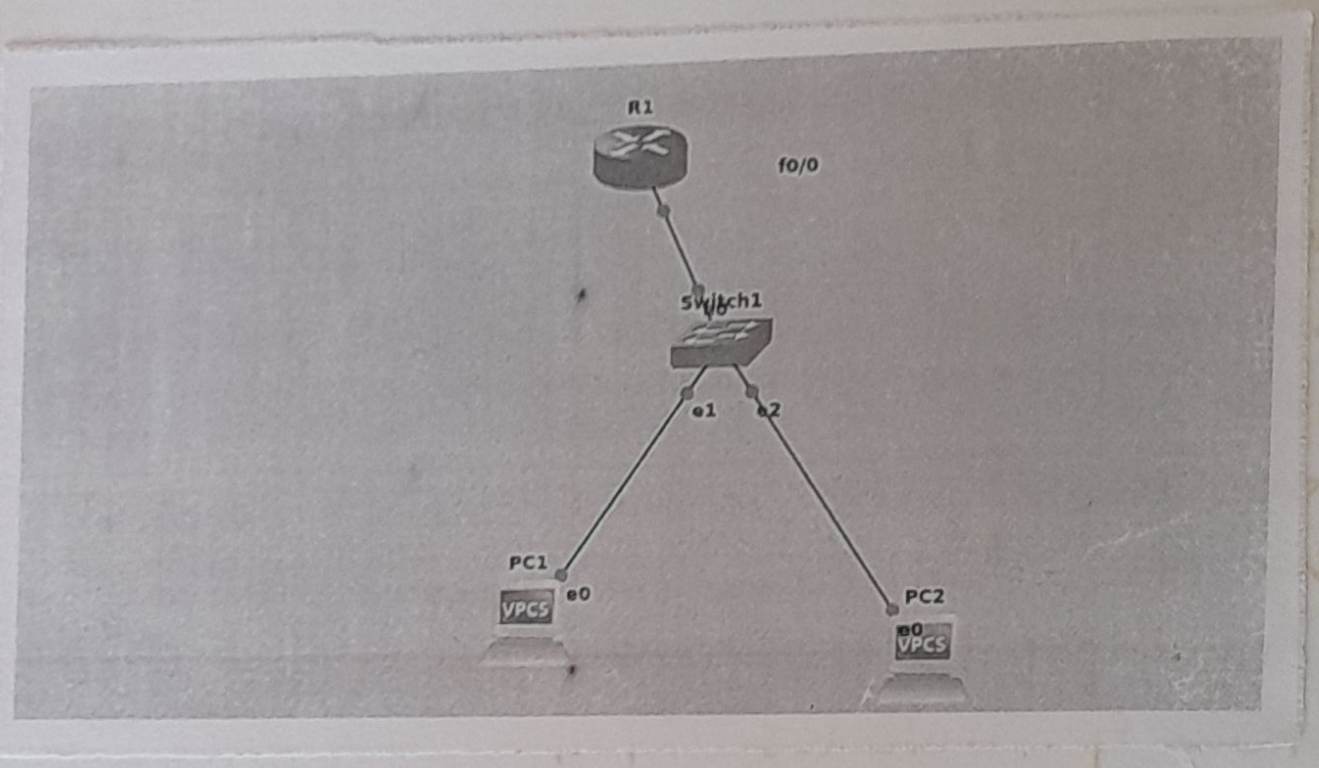
To implement computer network using switch

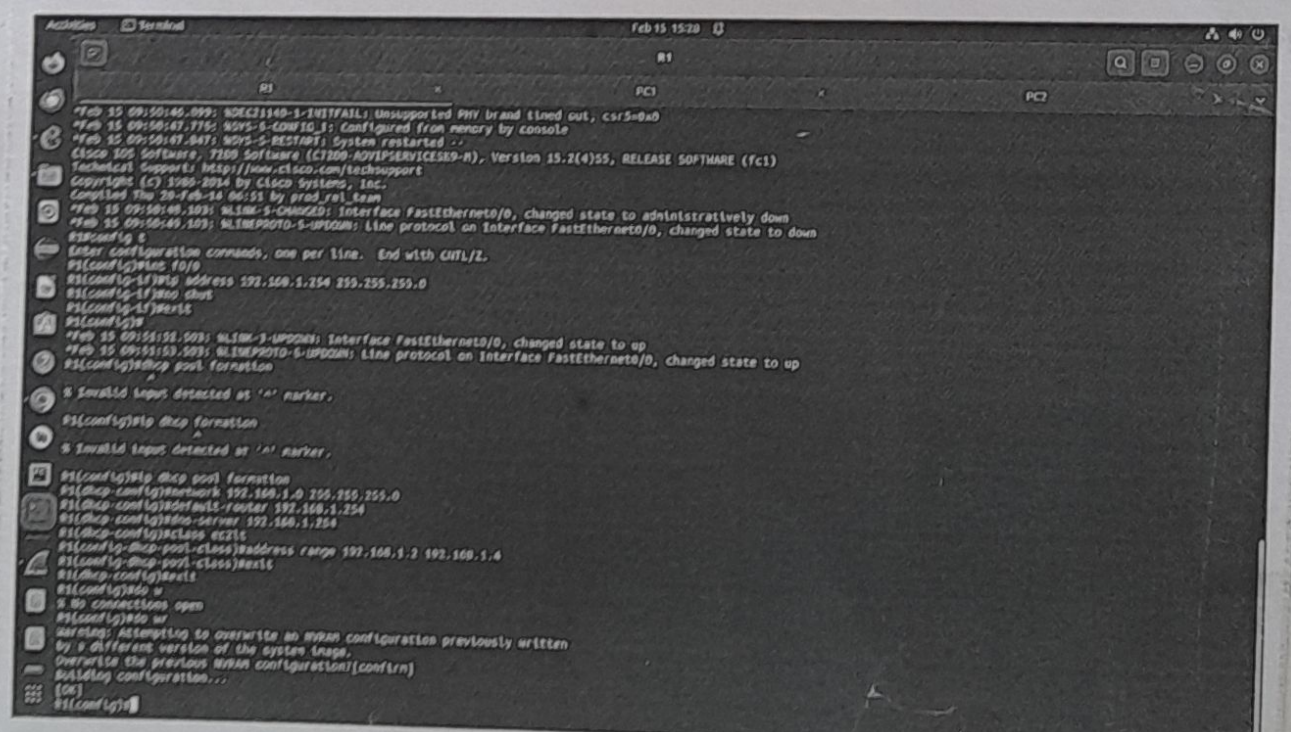
Procedure:

1) Assemble components (4 VPC's and ethernet switch)
2) Make connection as shown in diagram
3) Start the devices
4) Right clicks on VPC's and select console.
   - PC1 = ip 192.168.1.1/24
   - PC2 = ip 192.168.1.2/24
   - PC3 = ip 192.168.1.3/24
   - PC4 = ip 192.168.1.4/24
5) Start capture by right clicking on connection
6) Go to console of PC1 & PC1 => Ping 192.168.1.3 => C2






R1
f0/0
Switch1
e1
e2
PC1
VPCS
e0
PC2
VPCS
e0


Activities
Terminal
Feb 15 15:28
R1
R1
PC1
PC2
*Feb 15 09:50:46.099: %DEC21140-1-INITFAIL: Unsupported PHY brand timed out, csr5=0x0
*Feb 15 09:50:47.775: %SYS-6-CONFIG_I: Configured from memory by console
*Feb 15 09:50:47.847: %SYS-5-RESTART: System restarted --
Cisco IOS Software, 7200 Software (C7200-ADVIPSERVICESK9-M), Version 15.2(4)S5, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2014 by Cisco Systems, Inc.
Compiled Thu 20-Feb-14 06:51 by prod_rel_team
*Feb 15 09:50:48.103: %LINK-5-CHANGED: Interface FastEthernet0/0, changed state to administratively down
*Feb 15 09:50:49.103: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to down
R1#config t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int f0/0
R1(config-if)#ip address 192.168.1.254 255.255.255.0
R1(config-if)#no shut
R1(config-if)#exit
R1(config)#
*Feb 15 09:54:52.503: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Feb 15 09:54:53.503: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R1(config)#dhcp pool formation
^
% Invalid input detected at '^' marker.
R1(config)#ip dhcp formation
^
% Invalid input detected at '^' marker.
R1(config)#ip dhcp pool formation
R1(dhcp-config)#network 192.168.1.0 255.255.255.0
R1(dhcp-config)#default-router 192.168.1.254
R1(dhcp-config)#dns-server 192.168.1.254
R1(dhcp-config)#class ece1s
R1(config-dhcp-pool-class)#address range 192.168.1.2 192.168.1.4
R1(config-dhcp-pool-class)#exit
R1(dhcp-config)#exit
R1(config)#do w
% No connections open
R1(config)#do wr
Warning: Attempting to overwrite an NVRAM configuration previously written
by a different version of the system image.
Overwrite the previous NVRAM configuration?[confirm]
Building configuration...
[OK]
R1(config)#

Expt. No. 08 Date 02/02/24

DYNAMIC HOST CONFIGURATION PROTOCOL

Aim:-

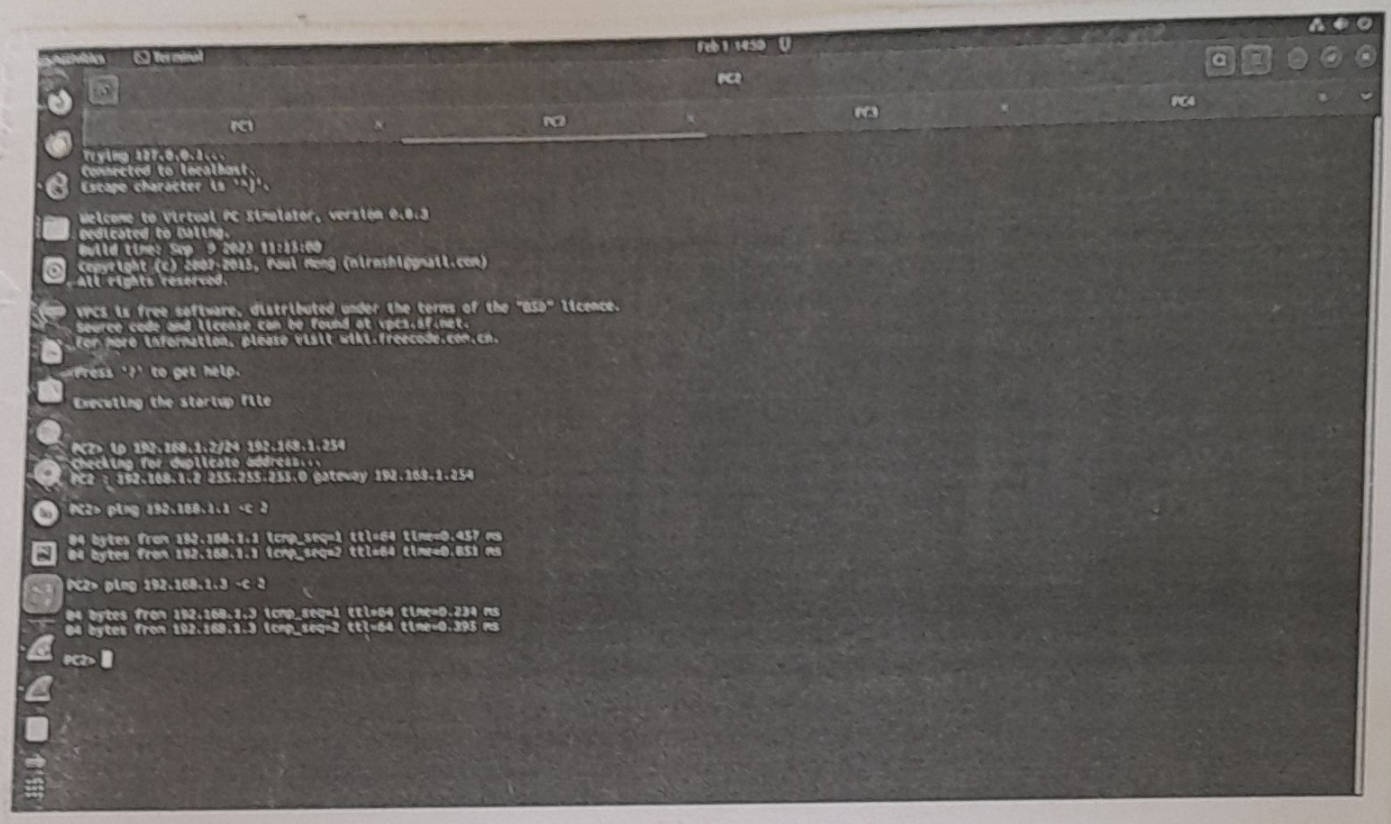
Analyze DHCP in concept network using router and switch in GNS3

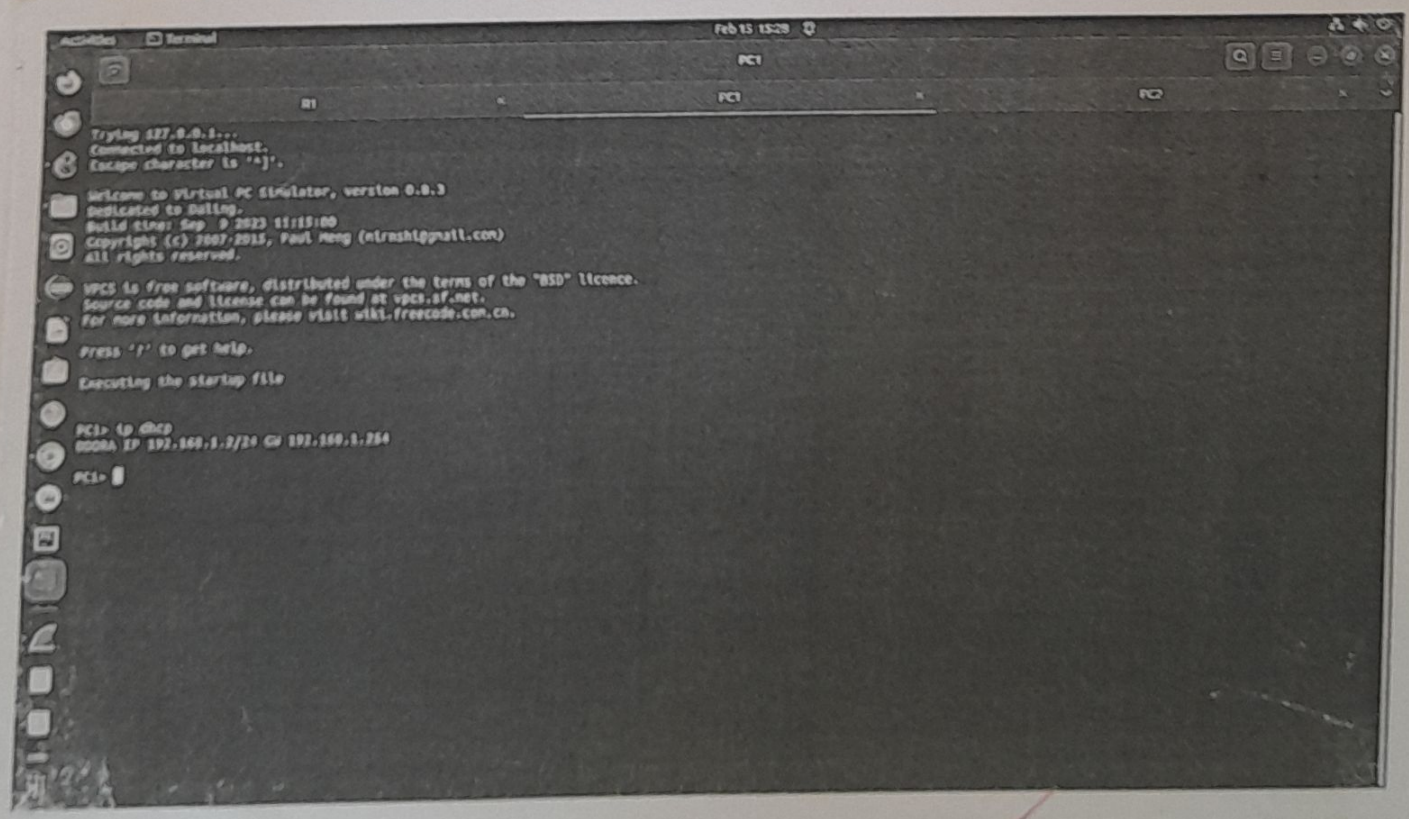
Procedure:-

1. Assemble the components 2 VPC's, 1 switch, 1 router
2. Make the connection as shown
3. Connect VPC1 and VPC2 to switch 1 and connect switch 1 to router R1
4. Start the devices
5. Right click on device and select console.
6. Start with router configuration

```
config t
int f0/0
ip address 192.168.1254 255.255.255.0
no shut
exit

ip dhcp pool formation
network 192.168.1.0 255.255.255.0
default router 192.168.1254
dns-server 192.168.1254
class eclt
address range 192.168.1.2 A2.168.1.4
exit
exit
```


Activities
Terminal
Feb 1 14:50
PC2
PC1
PC3
PC3
PC4
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
Welcome to Virtual PC Simulator, version 0.8.3
Dedicated to Daling.
Build time: Sep 9 2023 11:15:00
Copyright (c) 2007-2015, Paul Meng (mirnshi@gmail.com)
All rights reserved.
VPCS is free software, distributed under the terms of the "BSD" licence.
Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.
Press '?' to get help.
Executing the startup file
PC2> ip 192.168.1.2/24 192.168.1.254
Checking for duplicate address...
PC2 : 192.168.1.2 255.255.255.0 gateway 192.168.1.254
PC2> ping 192.168.1.1 -c 2
84 bytes from 192.168.1.1 icmp_seq=1 ttl=64 time=0.457 ms
84 bytes from 192.168.1.1 icmp_seq=2 ttl=64 time=0.851 ms
PC2> ping 192.168.1.3 -c 2
84 bytes from 192.168.1.3 icmp_seq=1 ttl=64 time=0.234 ms
84 bytes from 192.168.1.3 icmp_seq=2 ttl=64 time=0.395 ms
PC2>


Activities
Terminal
Feb 15 15:29
PC1
R1
PC3
PC2
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
Welcome to Virtual PC Simulator, version 0.8.3
Dedicated to Daling.
Build time: Sep 9 2023 11:15:00
Copyright (c) 2007-2015, Paul Meng (mirnshi@gmail.com)
All rights reserved.
VPCS is free software, distributed under the terms of the "BSD" licence.
Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.
Press '?' to get help.
Executing the startup file
PC1> ip dhcp
DDORA IP 192.168.1.2/24 GW 192.168.1.254
PC1>

Expt. No. ..... Date

do wr

7. Connect each pcs to switch again and then start ping

PC1 > ping 192.168.1.3 <not reachable>

PC2 > ping 192.168.1.2 → ping

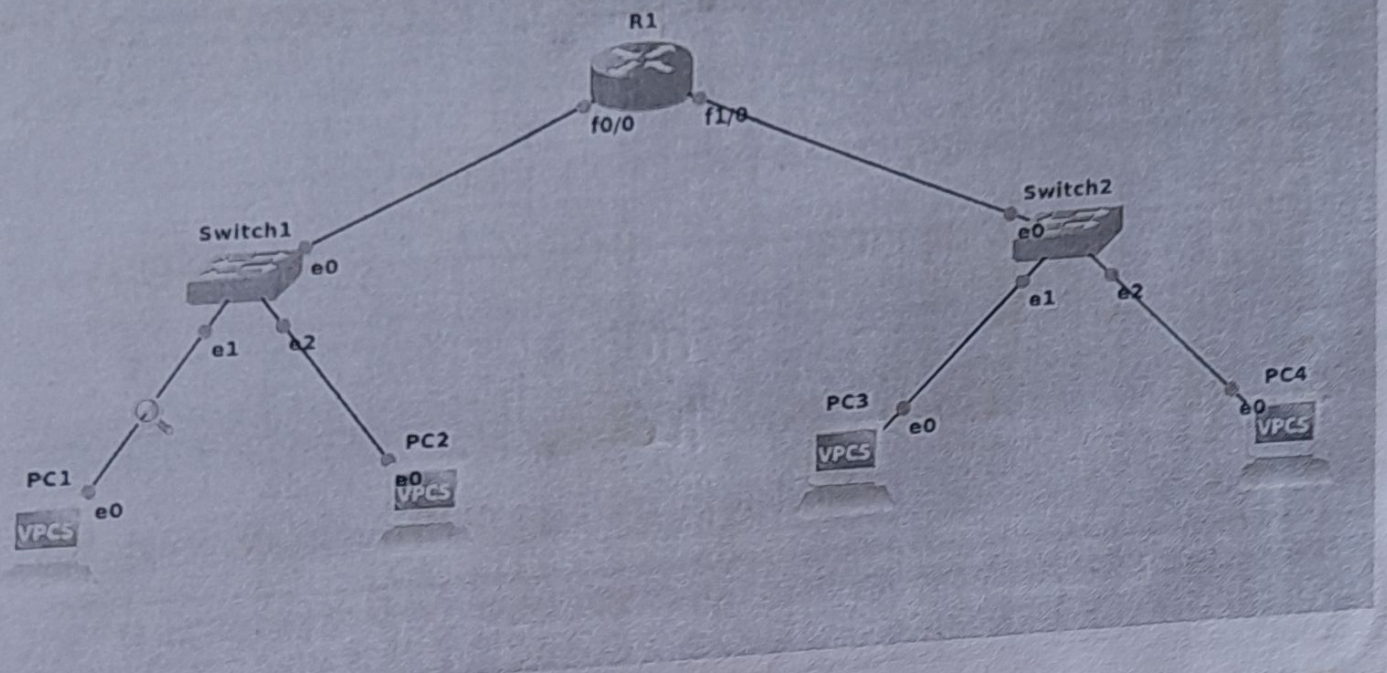
8) PC1 > Console → ip dhcp

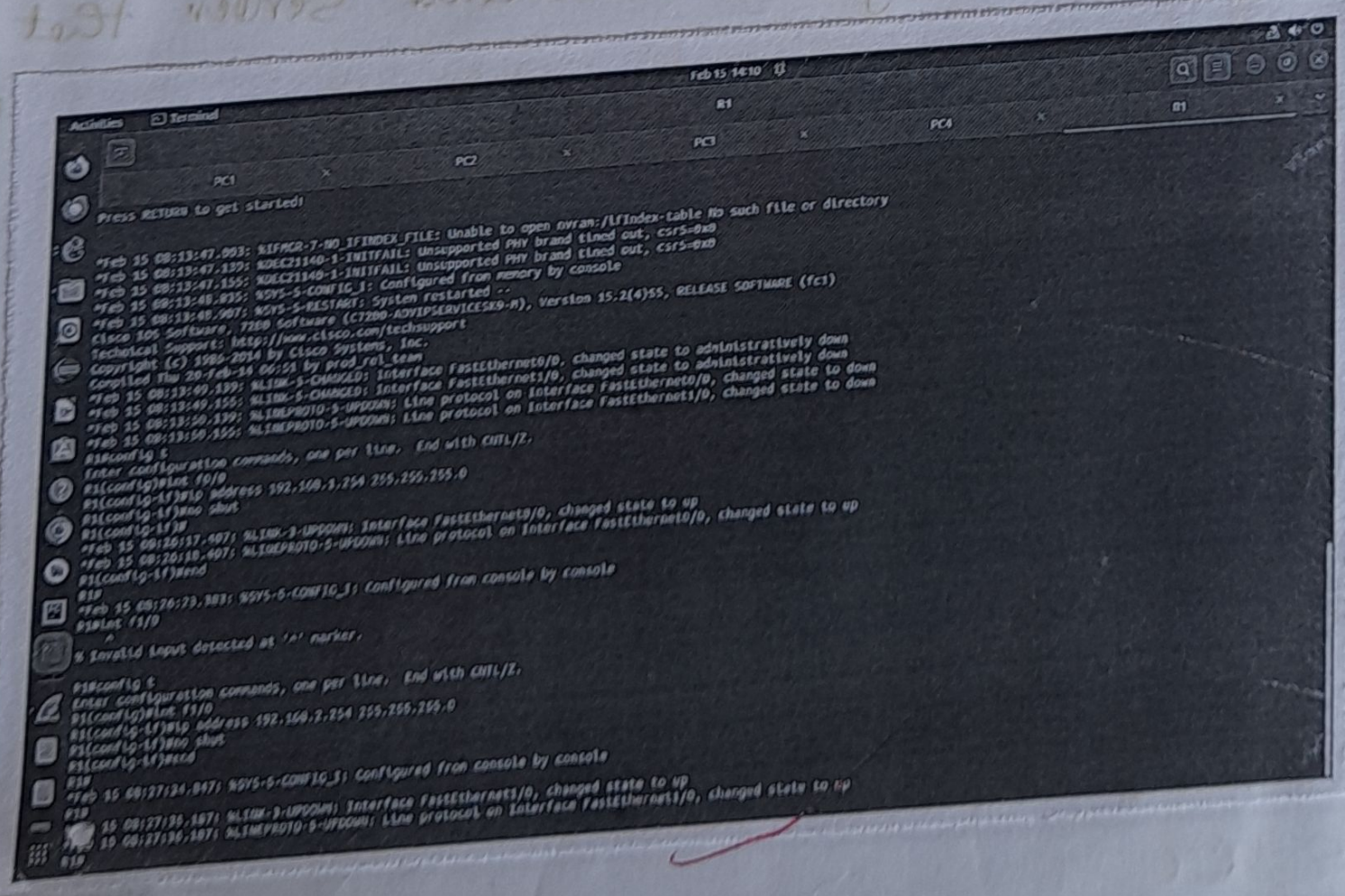
PC2 > Console → ip dhcp

show ip

Conclusion:-

DHCP uses DORA process to provide ip addresses to the host or to the client machine. It collects all of the ip-address from the central server that are accessible and give them to host and that want to connect to the network.


R1
f0/0
f1/0
Switch1
e0
e1
e2
Switch2
e0
e1
e2
PC1
e0
PC2
e0
PC3
e0
PC4
e0
VPCS


Activities
Terminal
Feb 15 14:10
R1
PC1
PC2
PC3
PC4
R1
Press RETURN to get started!
*Feb 15 08:13:47.003: %IFMGR-7-NO_IFINDEX_FILE: Unable to open nvram:/lfIndex-table No such file or directory
*Feb 15 08:13:47.139: %DEC21140-1-INITFAIL: Unsupported PHY brand timed out, csr5=0x0
*Feb 15 08:13:47.155: %DEC21140-1-INITFAIL: Unsupported PHY brand timed out, csr5=0x0
*Feb 15 08:13:48.035: %SYS-5-CONFIG_I: Configured from memory by console
*Feb 15 08:13:48.907: %SYS-5-RESTART: System restarted --
Cisco IOS Software, 7200 Software (C7200-ADVIPSERVICESK9-M), Version 15.2(4)S5, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2014 by Cisco Systems, Inc.
Compiled Thu 20-Feb-14 06:51 by prod_rel_team
*Feb 15 08:13:49.139: %LINK-5-CHANGED: Interface FastEthernet0/0, changed state to administratively down
*Feb 15 08:13:49.155: %LINK-5-CHANGED: Interface FastEthernet1/0, changed state to administratively down
*Feb 15 08:13:50.139: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to down
*Feb 15 08:13:50.155: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to down
R1#config t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int f0/0
R1(config-if)#ip address 192.168.1.254 255.255.255.0
R1(config-if)#no shut
R1(config-if)#
*Feb 15 08:20:17.407: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Feb 15 08:20:18.407: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R1(config-if)#end
R1#
*Feb 15 08:26:23.803: %SYS-5-CONFIG_I: Configured from console by console
R1#int f1/0
^
% Invalid input detected at '^' marker.
R1#config t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int f1/0
R1(config-if)#ip address 192.168.2.254 255.255.255.0
R1(config-if)#no shut
R1(config-if)#end
R1#
*Feb 15 08:27:24.047: %SYS-5-CONFIG_I: Configured from console by console
R1#
*Feb 15 08:27:30.107: %LINK-3-UPDOWN: Interface FastEthernet1/0, changed state to up
*Feb 15 08:27:30.107: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up
R1#

Expt. No. 06 Date 02/02/24

Routers

Aim:-

Analyze router in computer networks using GNS3.

Procedure:-

1) Assemble components (4 VPC's, 2 ethernet switch and 1 router)
2) Make connection as shown
3) Connect VPC's S1 and VPCS S2 with switch S1 and connect VPC's S3 and VPC's S4 with switch S2
4) Connect switch1 and switch2 to router R1
5) Start the device.
6) Right click on connection and select console.

Pc configuration through terminal

PC1 => ip 192.168.1.1/24 192.168.1.254
PC2 => ip 192.168.1.2/24 192.168.1.254
PC3 => ip 192.168.2.1/24 192.168.2.254
PC4 => ip 192.168.2.2/24 192.168.2.254

7) Router configuration through terminal for connection

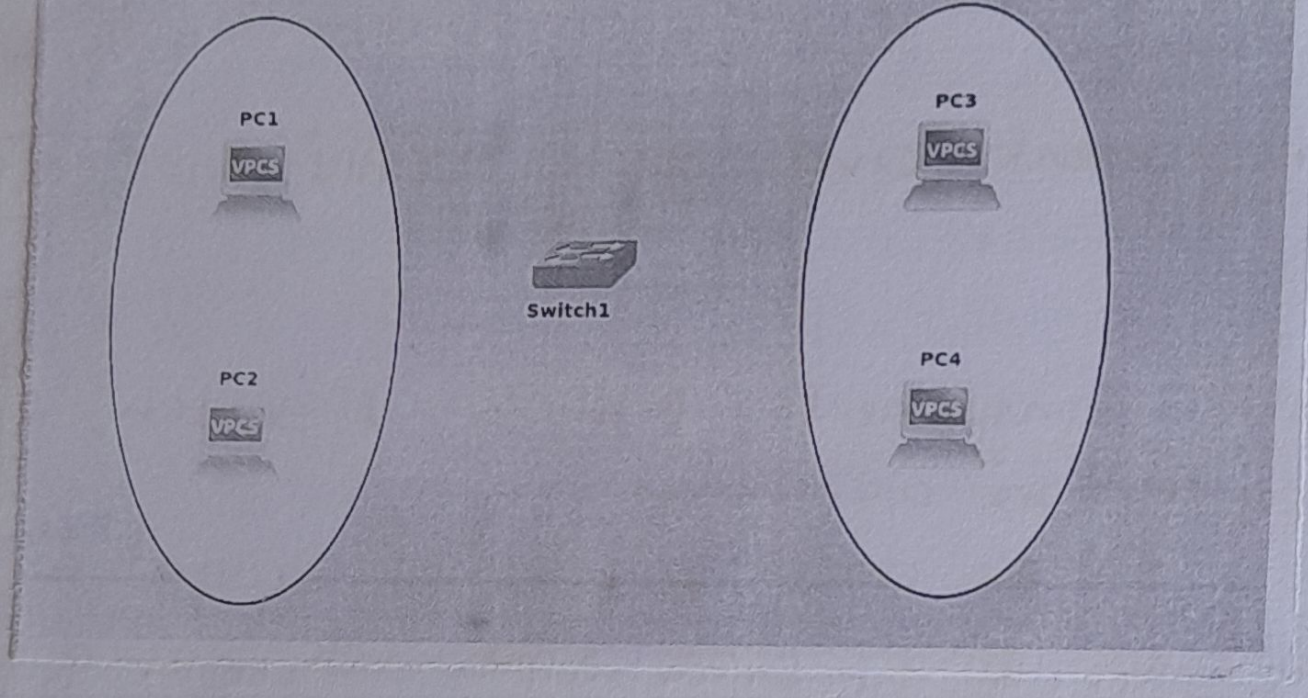
```
010 is
  config t
  int f0/0
  ip address 192.168.1.254 255.255.255.0
  no shut
  end
```

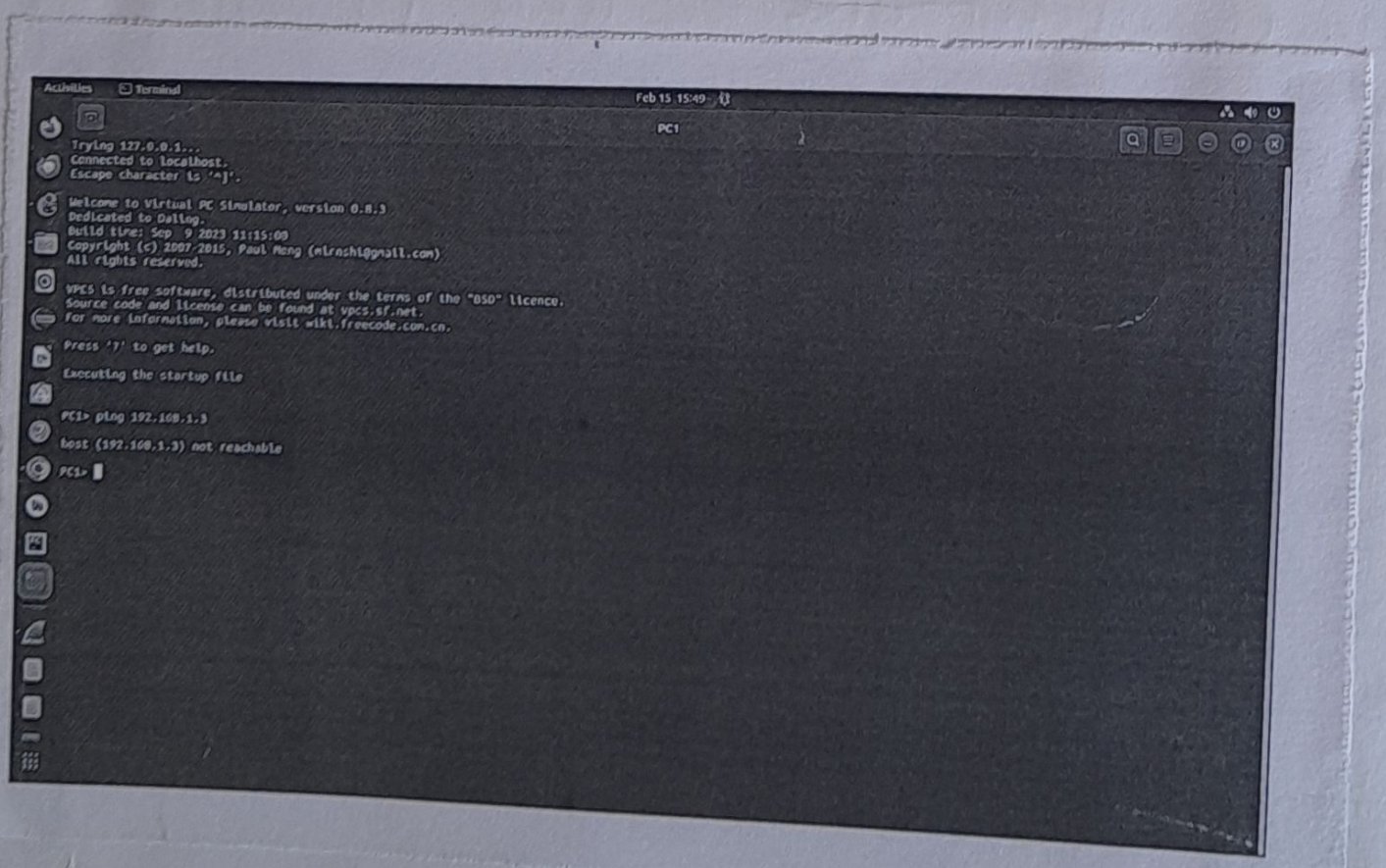
for connection f1/0 config t

Expt. No. ..... Date □□/□□/□□

int f7/0 ip address 192.168.2.254 255.255.255.0
no shut
exit

f1/3/24


PC1
VPCS
PC2
VPCS
Switch1
PC3
VPCS
PC4
VPCS


Activities
Terminal
Feb 15 15:49
PC1
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
Welcome to Virtual PC Simulator, version 0.8.3
Dedicated to Daling.
Build time: Sep 9 2023 11:15:09
Copyright (c) 2007-2015, Paul Meng (mirnshi@gmail.com)
All rights reserved.
VPCS is free software, distributed under the terms of the "BSD" licence.
Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.
Press '?' to get help.
Executing the startup file
PC1> ping 192.168.1.3
host (192.168.1.3) not reachable
PC1>

Expt. No. 09 Date 16/02/24

VIRTUAL LOCAL AREA NETWORK (VLAN)

Aim:-

To implement and study VLAN in GNS3

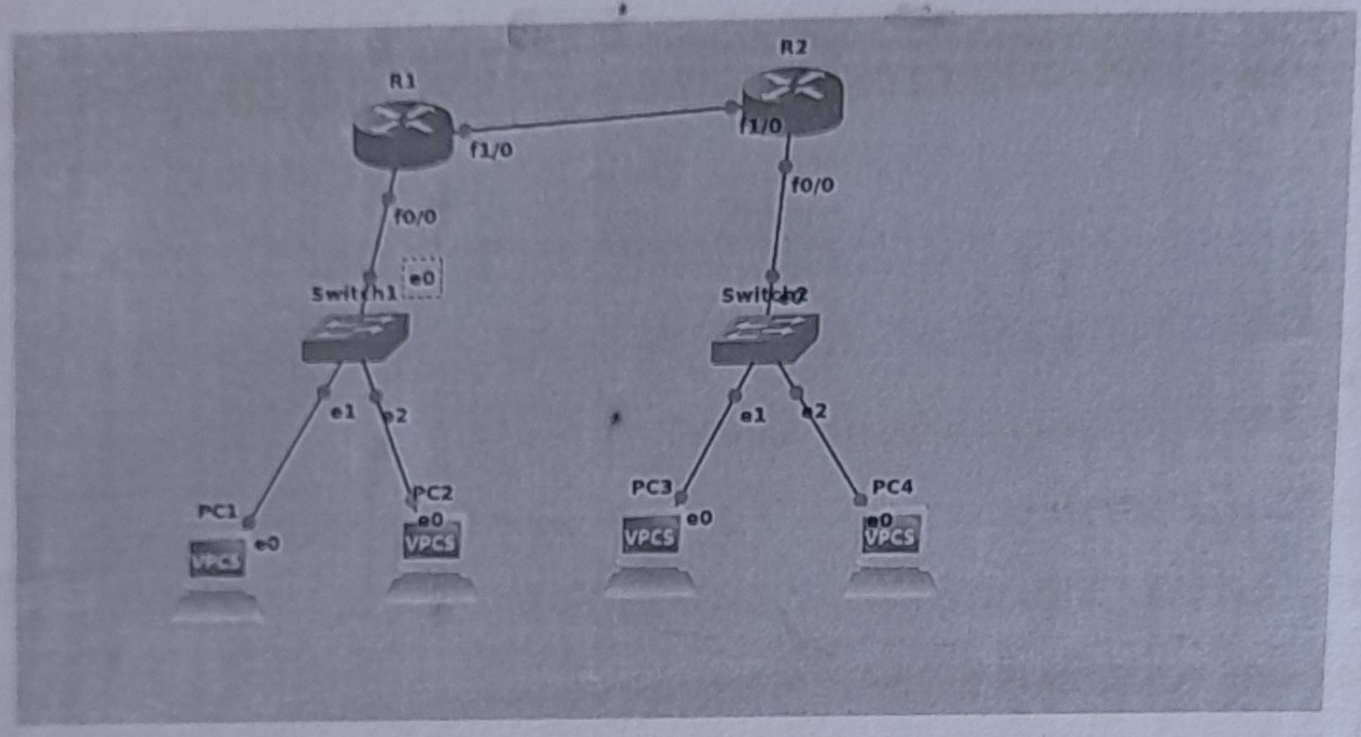
Procedure:-

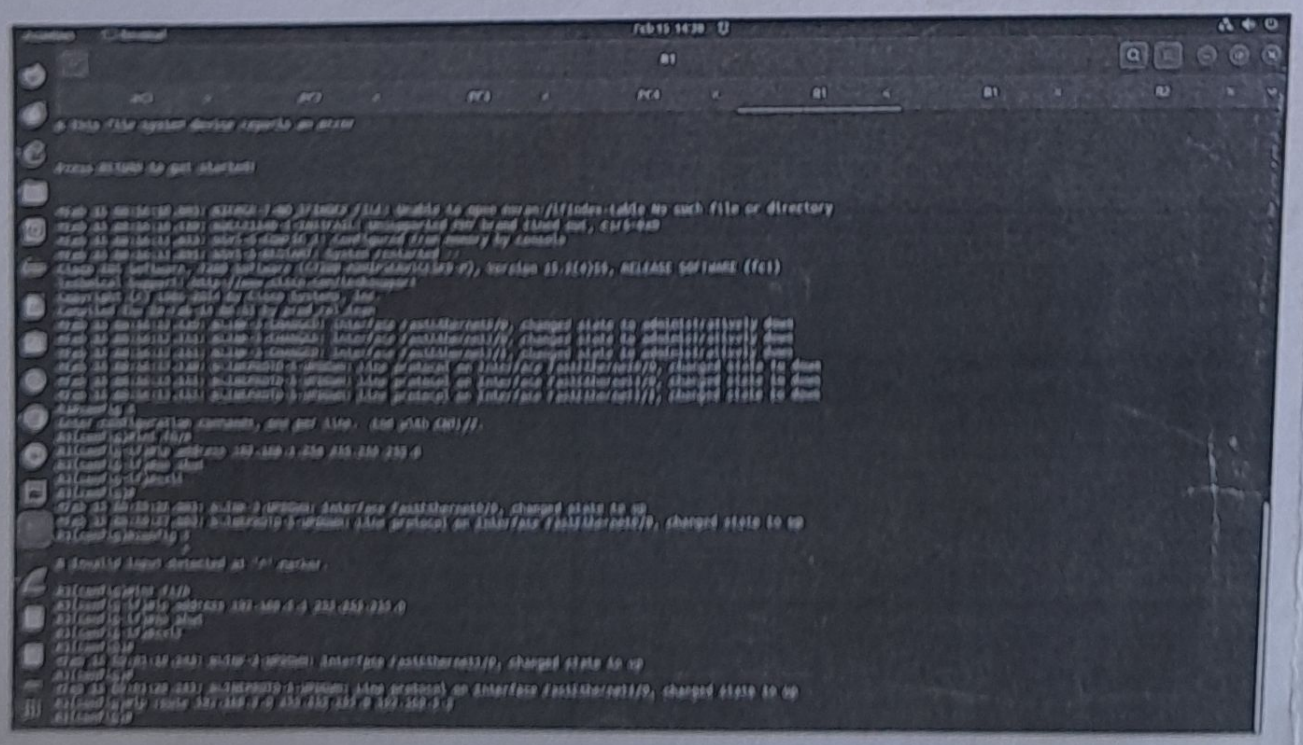
1. Assemble components (4 VPC's, 1 switch, 2 groups)
2. Make connections as shown.
3. Connect 4 VPC's and 1 ethernet switch.
4. select and draw eclipse, right click, lower the layer and rename group1 and group2
5. PC1 => ip 192.168.1.1/24 set ip to all pc's
   PC2 => ip 192.168.1.2/24
   PC3 => ip 192.168.1.3/24
   PC4 => ip 192.168.1.4/24
6. PC 1 => ping 192.168.1.3
   PC2 => ping 192.168.1.2
7. delete the connection cable
8. Right click on switch and click configure

port	VLAN
0	1 -> (PC1) -> Add
1	1 -> (PC2) -> Add
2	2 -> (PC3) -> Add
3	2 -> (PC4) -> Add.

9. click on apply.
10. click on check -> add -> apply -> ok

4/3/24


R1
R2
f1/0
f1/0
f0/0
f0/0
Switch1
e0
e1
e2
e1
e2
PC1
e0
VPCS
PC2
e0
VPCS
PC3
e0
VPCS
PC4
e0
VPCS



Expt. No. 08 Date 16/02/24

Double Router

Aim:-

Analyze double router in Computer network using GNS3.

Procedure:-

1) Assemble components (4 VPCs, 2 ethernet switch and 2 router)
2) Make connection as shown
3) Connect VPC's S1 & VPC's S2 with switch S1 & connect VPC's S3 and VPC's S4 with switch S2.
4) Connect switch1 and switch2 to router R1 & R2
5) Start the device.
6) Right click on connection and select console.

PC configuration through terminal

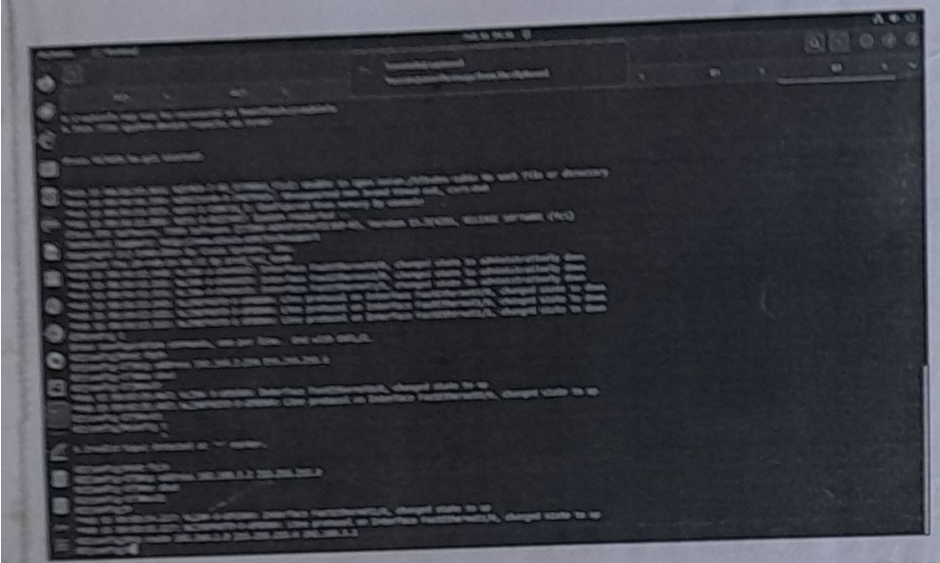
PC1 => ip	192.168.1.1/24	192.168.1.254
PC2 => ip	192.168.1.2/24	192.168.1.254
PC3 => ip	192.168.2.1/24	192.168.2.254
PC4 => ip	192.168.2.2/24	192.168.2.254

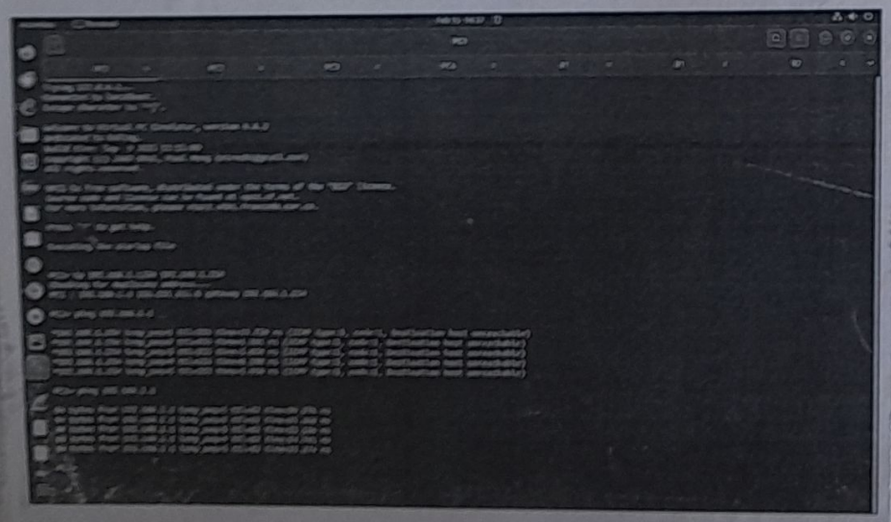
Router configuration through terminal for connection

R1 configure

```
config t
int f0/0
ip address 192.168.1.254 255.255.255.0
no shut
```

Expt. No. ..... Date





exit

int f1/0
ip address 192.168.5.1 255.255.255.0
no shut
exit

R2 configure

config t
int f0/0
ip address 192.168.2.254 255.255.255.0
no shut
exit

int f1/0
ip address 192.168.5.2 255.255.255.0
no shut
exit

PC1 => ping 192.168.2.1 => not reachable.
R1 - ip route 192.168.2.0 255.255.255.0 192.168.5.2

R2 - ip route 192.168.10 255.255.255.0 192.168.5.1
PC1 => ping 192.168.2.1

4 13/24