

Assignment 5

Q2.

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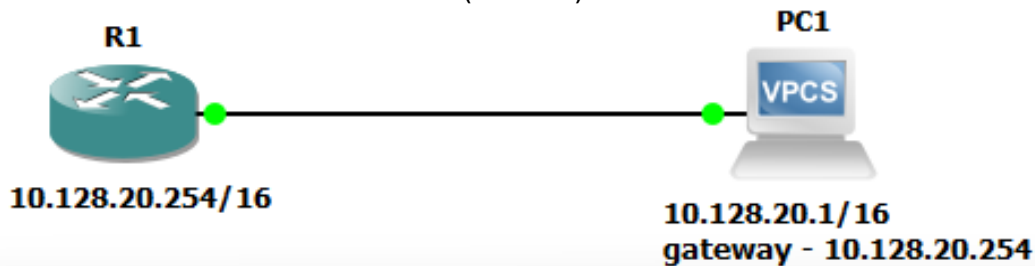
```
PC1
PC1 : 192.168.1.1 255.255.255.0

PC1> ping 192.168.1.1
192.168.1.1 icmp_seq=1 ttl=64 time=0.001 ms
192.168.1.1 icmp_seq=2 ttl=64 time=0.001 ms
192.168.1.1 icmp_seq=3 ttl=64 time=0.001 ms
192.168.1.1 icmp_seq=4 ttl=64 time=0.001 ms
192.168.1.1 icmp_seq=5 ttl=64 time=0.001 ms

PC1>
```

Q3.

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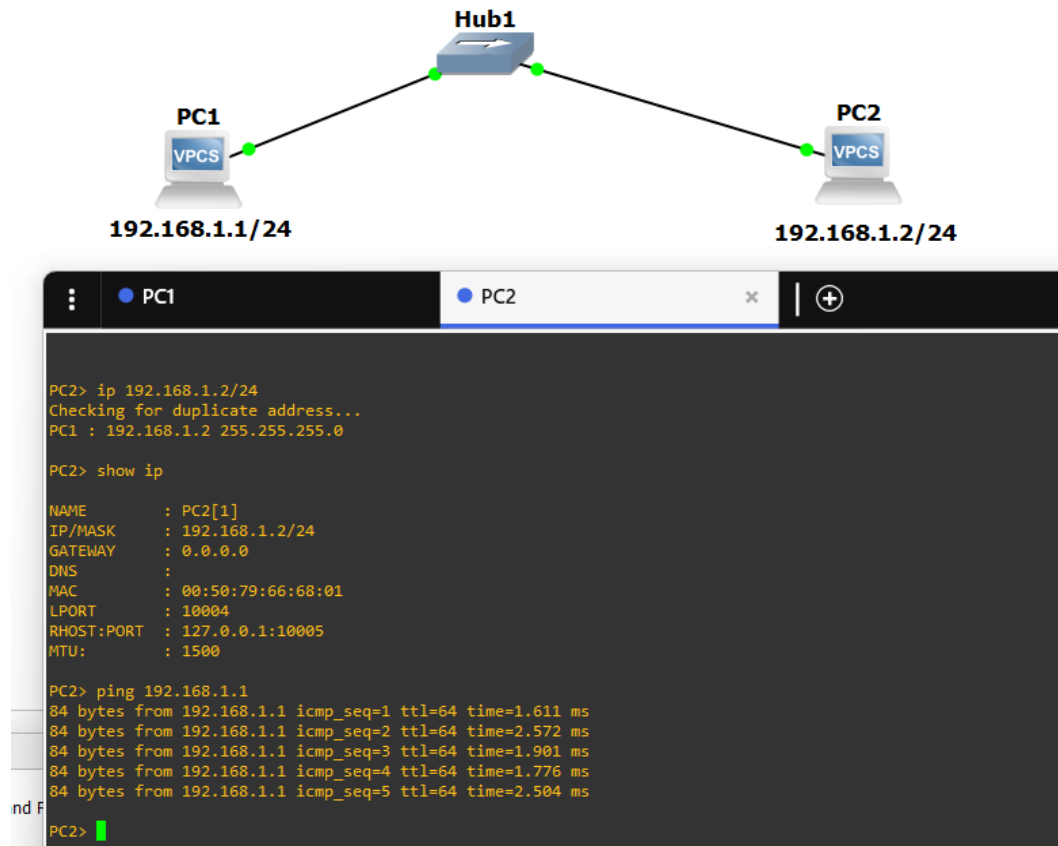
```
PC1
PC1 : 10.128.20.1 255.255.0.0 gateway 10.128.20.254

PC1> ping 10.128.20.254
10.128.20.254 icmp_seq=1 timeout
84 bytes from 10.128.20.254 icmp_seq=2 ttl=255 time=46.862 ms
84 bytes from 10.128.20.254 icmp_seq=3 ttl=255 time=15.600 ms
84 bytes from 10.128.20.254 icmp_seq=4 ttl=255 time=19.864 ms
84 bytes from 10.128.20.254 icmp_seq=5 ttl=255 time=15.589 ms

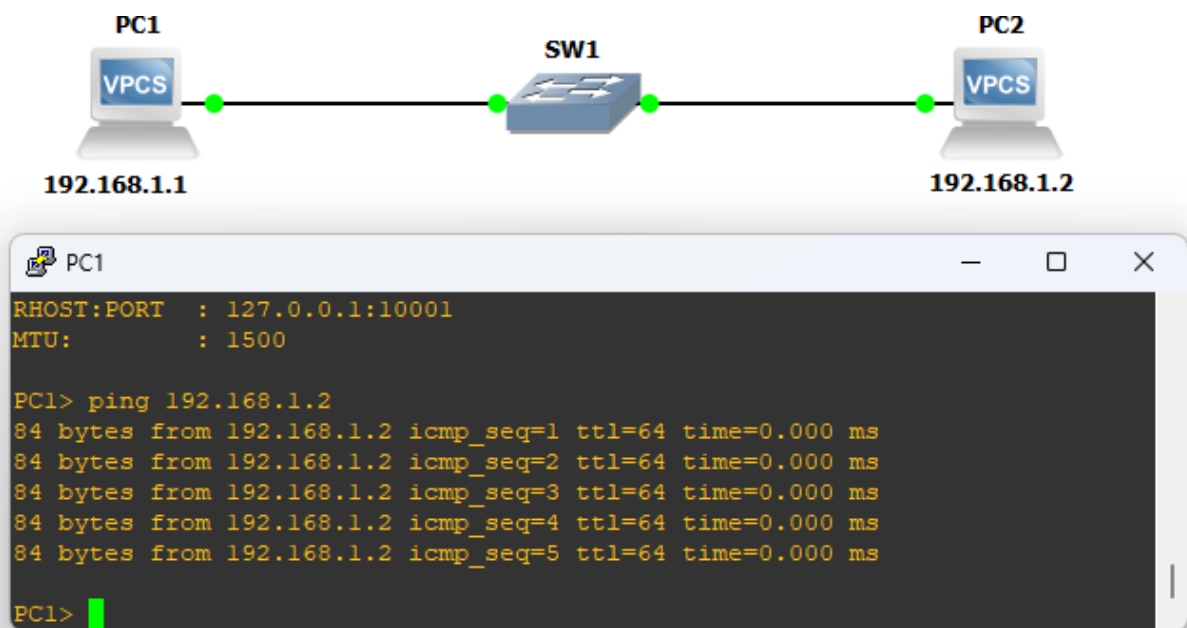
PC1>
```

Q4.

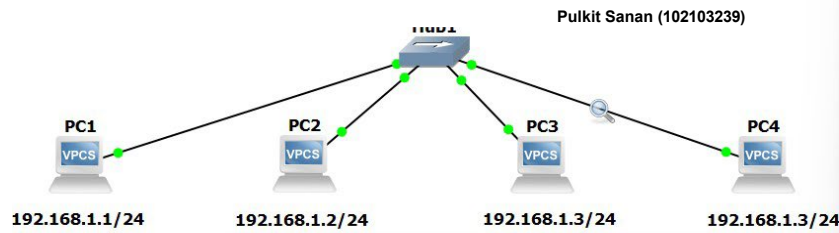
Pulkit Sanan (102103239)



Q5.



Q6. a) The answer to Q1. can be seen below. The first two pings show the ARP in effect.



```

MAC      : 00:50:79:66:68:00
IPPORT   : 10006
RHOST:PORT : 127.0.0.1:10007
MTU:      : 1500

PC1> ip 192.168.1.1
Checking for duplicate address...
PC1 : 192.168.1.1 255.255.255.0

PC1> ping 192.168.1.3
84 bytes from 192.168.1.3 icmp_seq=1 ttl=64 time=1.416 ms
84 bytes from 192.168.1.3 icmp_seq=2 ttl=64 time=1.636 ms
84 bytes from 192.168.1.3 icmp_seq=3 ttl=64 time=2.257 ms
84 bytes from 192.168.1.3 icmp_seq=4 ttl=64 time=1.681 ms
84 bytes from 192.168.1.3 icmp_seq=5 ttl=64 time=2.019 ms

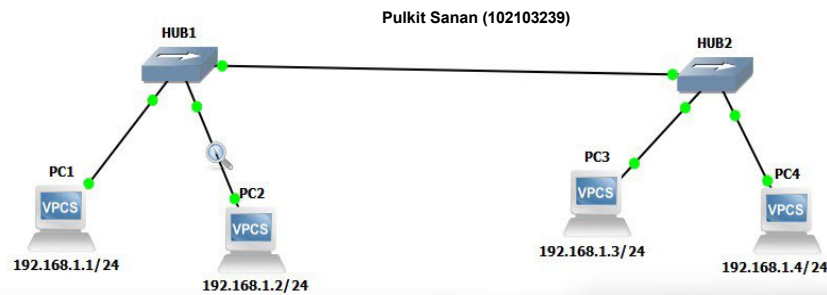
PC1> ping 192.168.1.2
84 bytes from 192.168.1.2 icmp_seq=1 ttl=64 time=1.400 ms
84 bytes from 192.168.1.2 icmp_seq=2 ttl=64 time=1.592 ms
84 bytes from 192.168.1.2 icmp_seq=3 ttl=64 time=2.565 ms
84 bytes from 192.168.1.2 icmp_seq=4 ttl=64 time=2.444 ms
84 bytes from 192.168.1.2 icmp_seq=5 ttl=64 time=1.486 ms

PC1>
  
```

Capturing from - [Hub1 Ethernet2 to PC4 Ethernet0]

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	Private_66:68:00	Broadcast	ARP	64	Who has 192.168.1.3?
2	0.001018	Private_66:68:01	Private_66:68:00	ARP	64	192.168.1.2 is at 00:50:79:66:68:01
3	0.015602	192.168.1.1	192.168.1.2	ICMP	98	Echo (ping) request
4	0.016655	192.168.1.2	192.168.1.1	ICMP	98	Echo (ping) reply
5	1.039775	192.168.1.1	192.168.1.2	ICMP	98	Echo (ping) request
6	1.040734	192.168.1.2	192.168.1.1	ICMP	98	Echo (ping) reply
7	2.067102	192.168.1.1	192.168.1.2	ICMP	98	Echo (ping) request
8	2.068089	192.168.1.2	192.168.1.1	ICMP	98	Echo (ping) reply
9	3.094853	192.168.1.1	192.168.1.2	ICMP	98	Echo (ping) request
10	3.095903	192.168.1.2	192.168.1.1	ICMP	98	Echo (ping) reply
11	4.118983	192.168.1.1	192.168.1.2	ICMP	98	Echo (ping) request
12	4.120007	192.168.1.2	192.168.1.1	ICMP	98	Echo (ping) reply

b) Since a hub broadcasts data, the ping to PC3 also involves PC2



Capturing from - [HUB1 2 to PC2 Ethernet0]

No.	Time	Source	Destination	Protocol	Length	Info
20	61.720723	Private_66:68:00	Broadcast	ARP	64	Gratuitous ARP for 192.168.1.3
21	95.396876	Private_66:68:00	Broadcast	ARP	64	Who has 192.168.1.3? Tell
22	95.396876	Private_66:68:02	Private_66:68:00	ARP	64	192.168.1.3 is at 00:50:79:66:68:02
23	95.412590	192.168.1.1	192.168.1.3	ICMP	98	Echo (ping) request id=0
24	95.412590	192.168.1.3	192.168.1.1	ICMP	98	Echo (ping) reply id=0
25	96.443580	192.168.1.1	192.168.1.3	ICMP	98	Echo (ping) request id=0
26	96.443580	192.168.1.3	192.168.1.1	ICMP	98	Echo (ping) reply id=0
27	97.459499	192.168.1.1	192.168.1.3	ICMP	98	Echo (ping) request id=0
28	97.459499	192.168.1.3	192.168.1.1	ICMP	98	Echo (ping) reply id=0
29	98.475490	192.168.1.1	192.168.1.3	ICMP	98	Echo (ping) request id=0
30	98.475490	192.168.1.3	192.168.1.1	ICMP	98	Echo (ping) reply id=0
31	99.490976	192.168.1.1	192.168.1.3	ICMP	98	Echo (ping) request id=0
32	99.490976	192.168.1.3	192.168.1.1	ICMP	98	Echo (ping) reply id=0

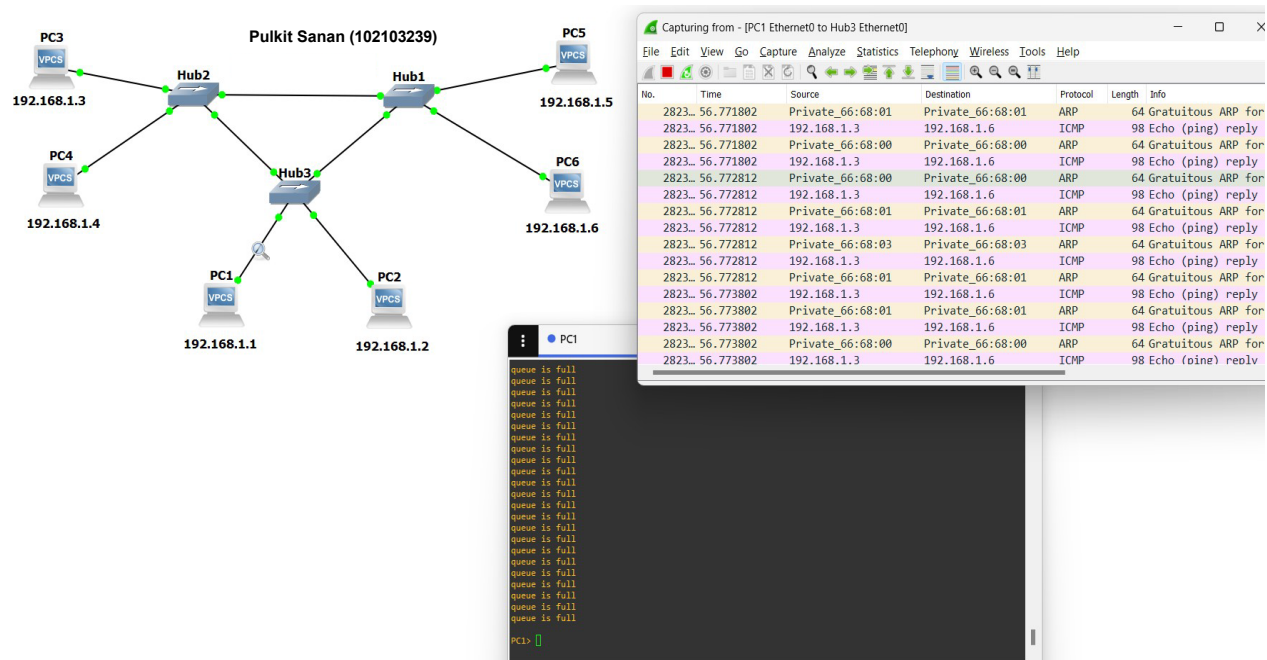
```

PC1 : 192.168.1.1 255.255.255.0

PC1> ping 192.168.1.3
84 bytes from 192.168.1.3 icmp_seq=1 ttl=64 time=0.000 ms
84 bytes from 192.168.1.3 icmp_seq=2 ttl=64 time=0.000 ms
84 bytes from 192.168.1.3 icmp_seq=3 ttl=64 time=0.000 ms
84 bytes from 192.168.1.3 icmp_seq=4 ttl=64 time=0.000 ms
84 bytes from 192.168.1.3 icmp_seq=5 ttl=64 time=0.000 ms

PC1>
  
```

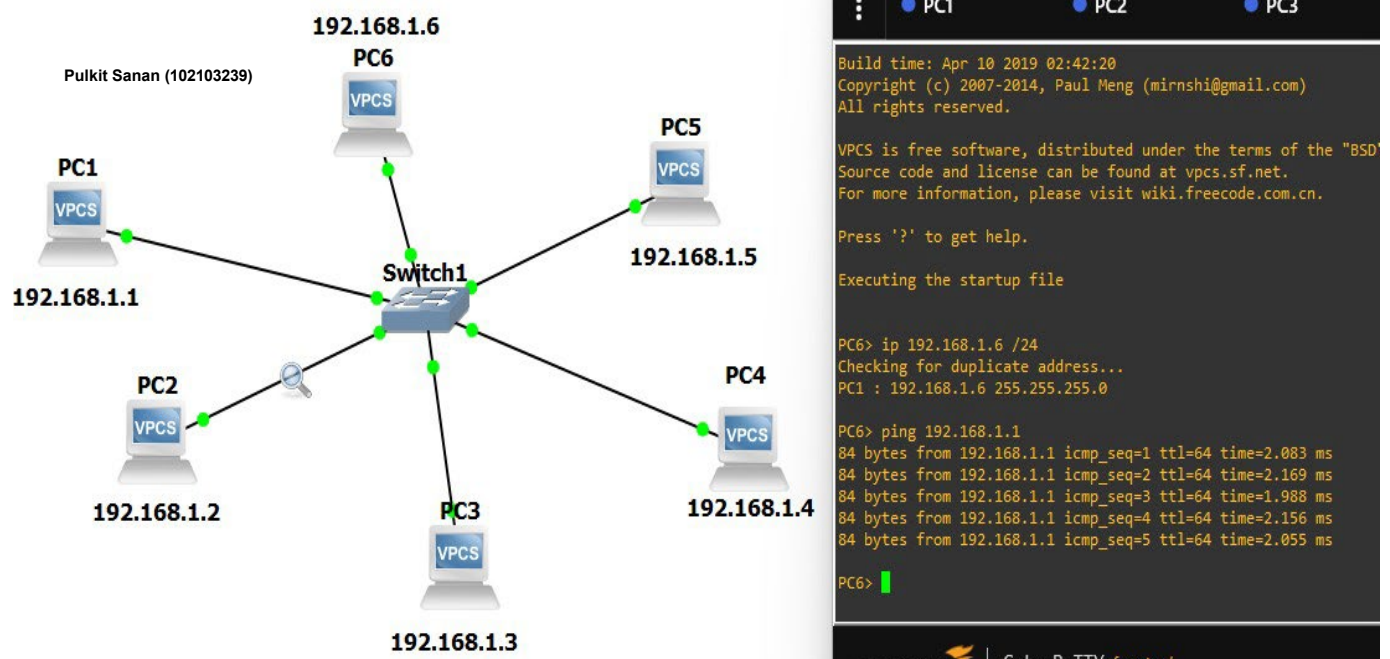
Q7. It can be seen from the Wireshark console that even though VPCS 3 & 2 are communicating, VPC1 is also getting the data due to the usage of a hub.



The network diagram shows three hubs (Hub1, Hub2, Hub3) connected in a triangle. Hub2 is connected to PC3 (192.168.1.3) and PC4 (192.168.1.4). Hub1 is connected to PC5 (192.168.1.5) and PC6 (192.168.1.6). Hub3 is connected to PC1 (192.168.1.1) and PC2 (192.168.1.2). A Wireshark capture on PC1's Ethernet0 interface shows traffic from both PC3 and PC4, confirming that all devices on the same hub receive all traffic sent to that hub.

No.	Time	Source	Destination	Protocol	Length	Info
2823	56.771802	Private_66:68:01	Private_66:68:01	ARP	64	Gratuitous ARP for
2823	56.771802	192.168.1.3	192.168.1.6	ICMP	98	Echo (ping) reply
2823	56.771802	Private_66:68:00	Private_66:68:00	ARP	64	Gratuitous ARP for
2823	56.771802	192.168.1.3	192.168.1.6	ICMP	98	Echo (ping) reply
2823	56.772812	Private_66:68:00	Private_66:68:00	ARP	64	Gratuitous ARP for
2823	56.772812	192.168.1.3	192.168.1.6	ICMP	98	Echo (ping) reply
2823	56.772812	Private_66:68:01	Private_66:68:01	ARP	64	Gratuitous ARP for
2823	56.772812	192.168.1.3	192.168.1.6	ICMP	98	Echo (ping) reply
2823	56.772812	Private_66:68:03	Private_66:68:03	ARP	64	Gratuitous ARP for
2823	56.772812	192.168.1.3	192.168.1.6	ICMP	98	Echo (ping) reply
2823	56.773802	Private_66:68:01	Private_66:68:01	ARP	64	Gratuitous ARP for
2823	56.773802	192.168.1.3	192.168.1.6	ICMP	98	Echo (ping) reply
2823	56.773802	Private_66:68:01	Private_66:68:01	ARP	64	Gratuitous ARP for
2823	56.773802	192.168.1.3	192.168.1.6	ICMP	98	Echo (ping) reply
2823	56.773802	Private_66:68:00	Private_66:68:00	ARP	64	Gratuitous ARP for
2823	56.773802	192.168.1.3	192.168.1.6	ICMP	98	Echo (ping) reply

Q8.



The network diagram shows a central switch (Switch1) connected to six PCs: PC1 (192.168.1.1), PC2 (192.168.1.2), PC3 (192.168.1.3), PC4 (192.168.1.4), PC5 (192.168.1.5), and PC6 (192.168.1.6). A terminal window on PC6 shows the following commands and output:

```

Build time: Apr 10 2019 02:42:20
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VPCS is free software, distributed under the terms of the "BSD"
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

PC6> ip 192.168.1.6 /24
Checking for duplicate address...
PC1 : 192.168.1.6 255.255.255.0

PC6> ping 192.168.1.1
84 bytes from 192.168.1.1 icmp_seq=1 ttl=64 time=2.083 ms
84 bytes from 192.168.1.1 icmp_seq=2 ttl=64 time=2.169 ms
84 bytes from 192.168.1.1 icmp_seq=3 ttl=64 time=1.988 ms
84 bytes from 192.168.1.1 icmp_seq=4 ttl=64 time=2.156 ms
84 bytes from 192.168.1.1 icmp_seq=5 ttl=64 time=2.055 ms

PC6>
  
```

Q9.

