Polytechnic University of Puerto Rico
Electrical and Computer Engineering & Computer Science Department
COE 4330, Section 80 – Computer Networks

Homework 3

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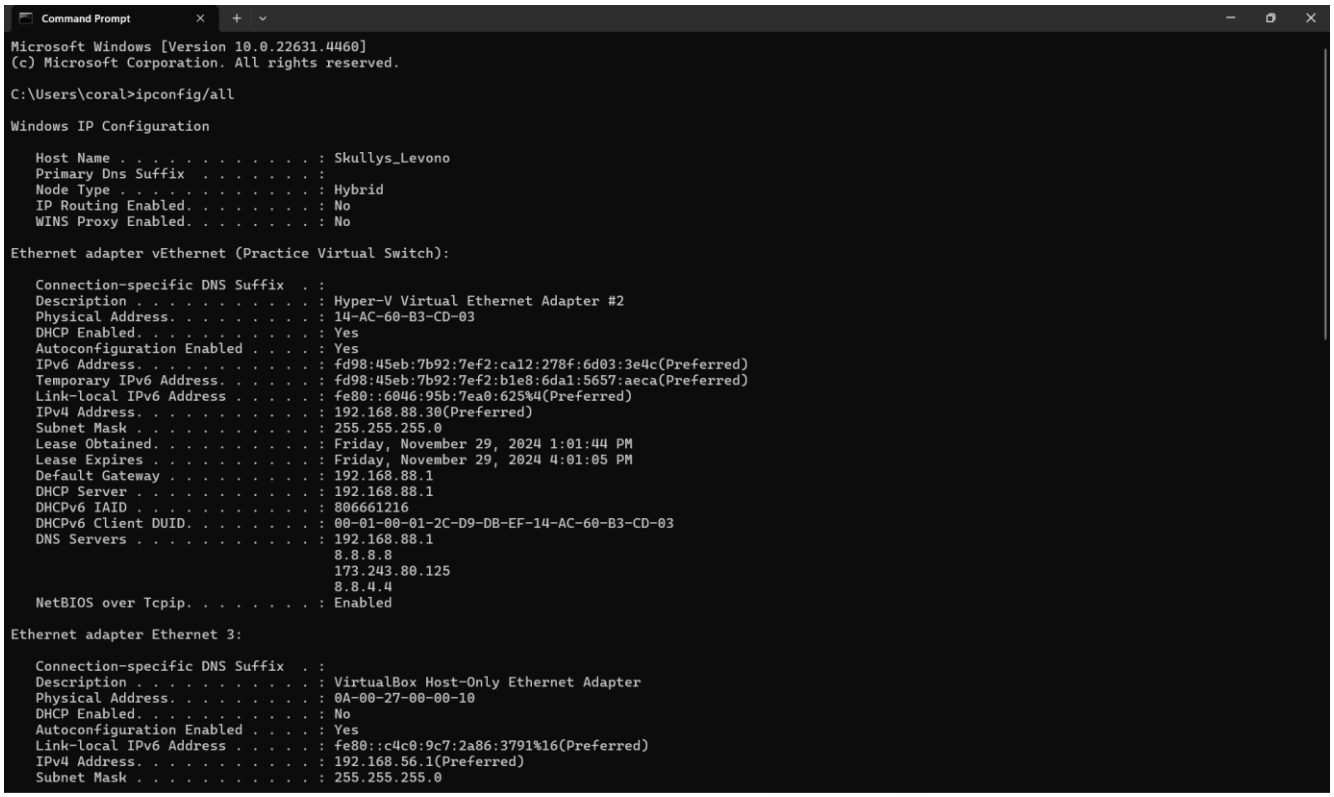
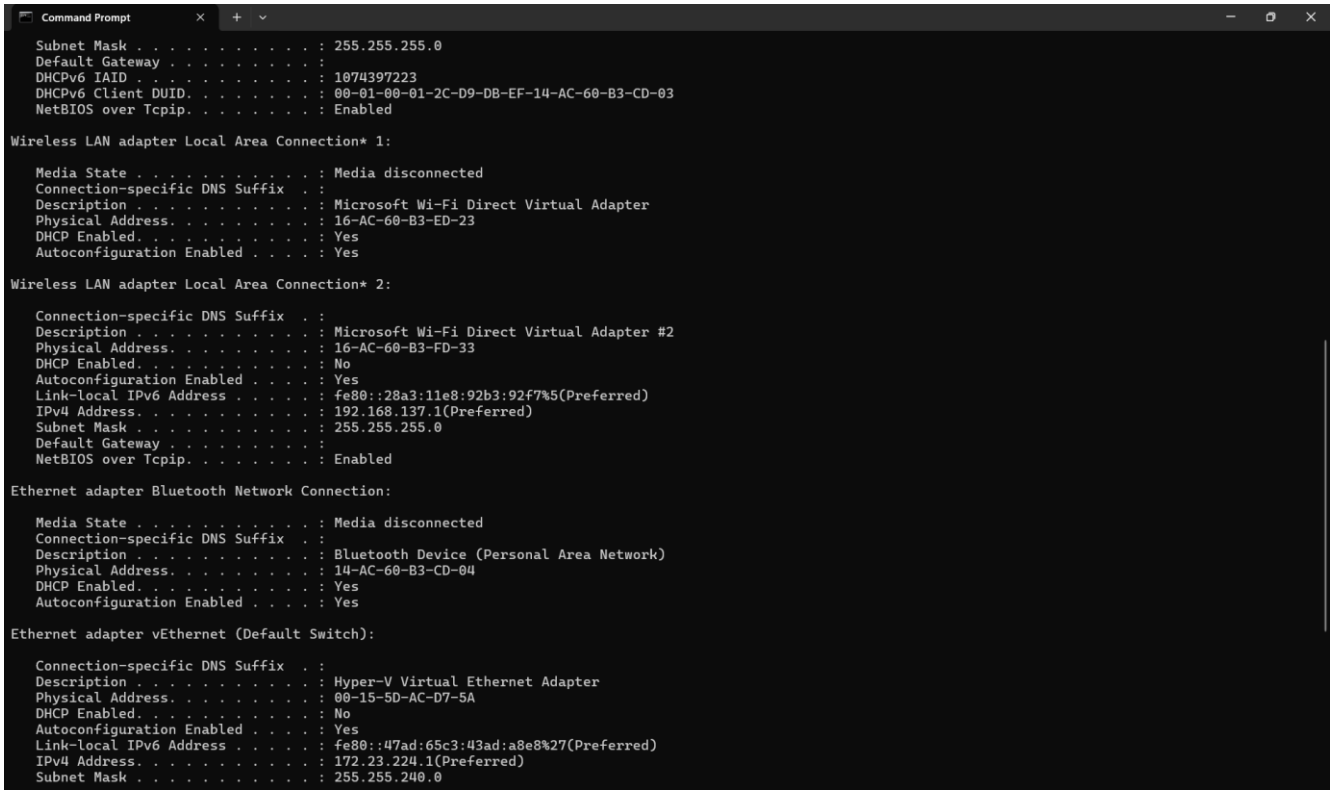
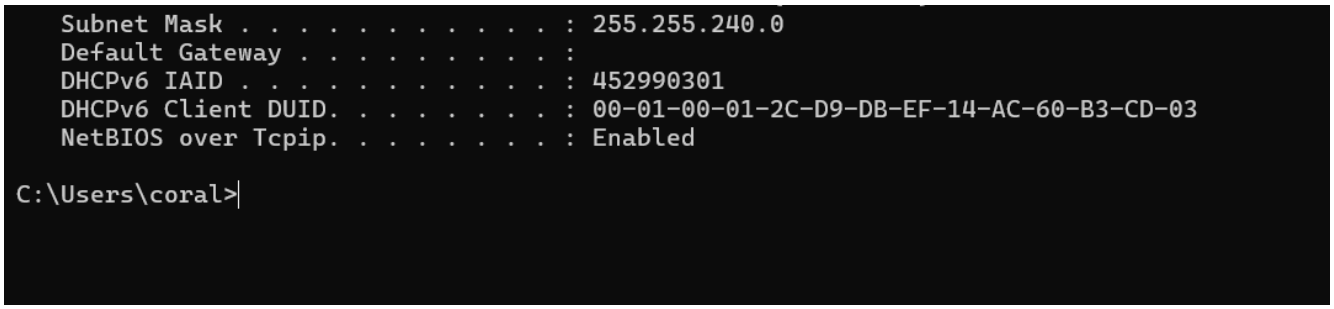
Completely answer all of the following questions.

1. Open Windows' Command Prompt and type ipconfig /all (in Linux/Unix/Mac type ifconfig). Provide a screenshot that shows the result of executing the command for the network interface in use during the exercise. This screenshot will show your computer's IP address, default gateway, and local DNS servers. *1 point*

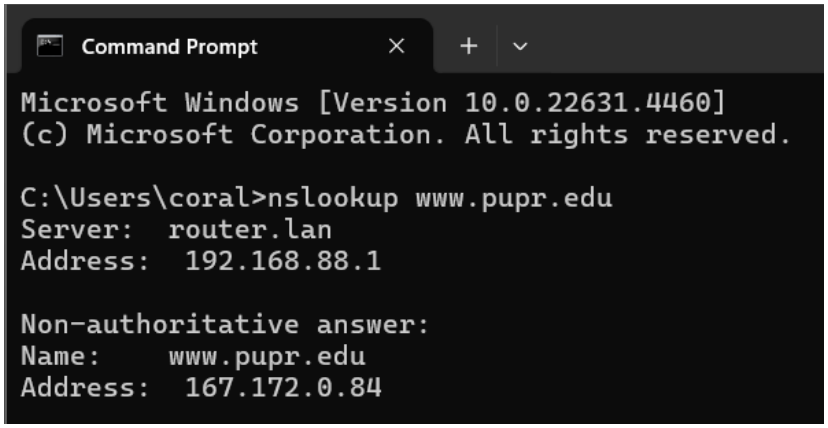






2. Run nslookup to obtain the IP address of the University's web site, www.pupr.edu. Include a screenshot to justify your answer. *1 point*

   As you can see from the screenshot below, the IP address of www.pupr.edu is **167.172.0.84**.



3. Run nslookup to determine the authoritative DNS servers for www.pupr.edu. Include a screenshot to justify your answer. *1 point*

   As you can see from the screenshot below, the authoritative DNS servers for www.pupr.edu are **ns1-37.azure-dns.com, ns2-37.azure-dns.net, ns3-37.azure-dns.org, and ns4-37.azure-dns.info**.

```
C:\Users\coral>nslookup -type=ns www.pupr.edu
Server:  router.lan
Address:  192.168.88.1

*** No name server (NS) records available for www.pupr.edu

C:\Users\coral>nslookup -type=ns pupr.edu
Server:  router.lan
Address:  192.168.88.1

Non-authoritative answer:
pupr.edu        nameserver = ns3-37.azure-dns.org
pupr.edu        nameserver = ns4-37.azure-dns.info
pupr.edu        nameserver = ns1-37.azure-dns.com
pupr.edu        nameserver = ns2-37.azure-dns.net

pupr.edu        nameserver = ns4-37.azure-dns.info
pupr.edu        nameserver = ns1-37.azure-dns.com
pupr.edu        nameserver = ns2-37.azure-dns.net
pupr.edu        nameserver = ns3-37.azure-dns.org
```

4. Run nslookup to determine the mail servers for www.pupr.edu. Include a screenshot to justify your answer. *1 point*

   As you can see from the screenshot below, the mail server for www.pupr.edu is **pupr-edu.mail.protection.outlook.com with an MX preference of 10**.

```
C:\Users\coral>nslookup -type=mx pupr.edu
Server:  router.lan
Address:  192.168.88.1

Non-authoritative answer:
pupr.edu        MX preference = 10, mail exchanger = pupr-edu.mail.protection.outlook.com

pupr.edu        nameserver = ns3-37.azure-dns.org
pupr.edu        nameserver = ns4-37.azure-dns.info
pupr.edu        nameserver = ns1-37.azure-dns.com
pupr.edu        nameserver = ns2-37.azure-dns.net
```

Complete the lab's Part 3 before answering the following questions.

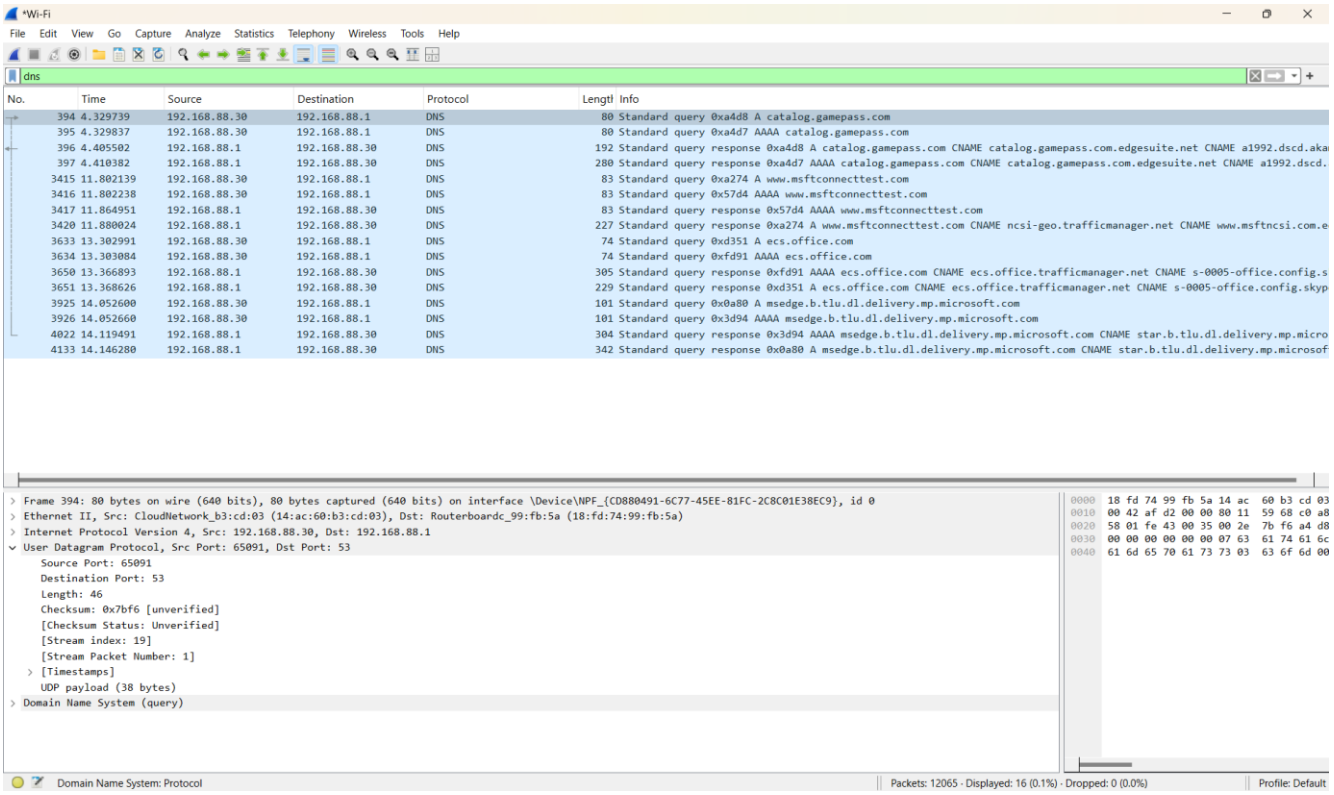
5. What is the IP address of your computer? Include a screenshot to justify your answer. *1 point*

   As you can see from the screenshot bellow, the IP address of my computer is **192.168.88.30**.

```
C:\Users\coral>ipconfig

Windows IP Configuration


Ethernet adapter vEthernet (Practice Virtual Switch):

   Connection-specific DNS Suffix  . :
   IPv6 Address. . . . . . . . . . . : fd98:45eb:7b92:7ef2:ca12:278f:6d03:3e4c
   Temporary IPv6 Address. . . . . . : fd98:45eb:7b92:7ef2:b1e8:6da1:5657:aeca
   Link-local IPv6 Address . . . . . : fe80::6046:95b:7ea0:625%4
   IPv4 Address. . . . . . . . . . . : 192.168.88.30
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.168.88.1
```

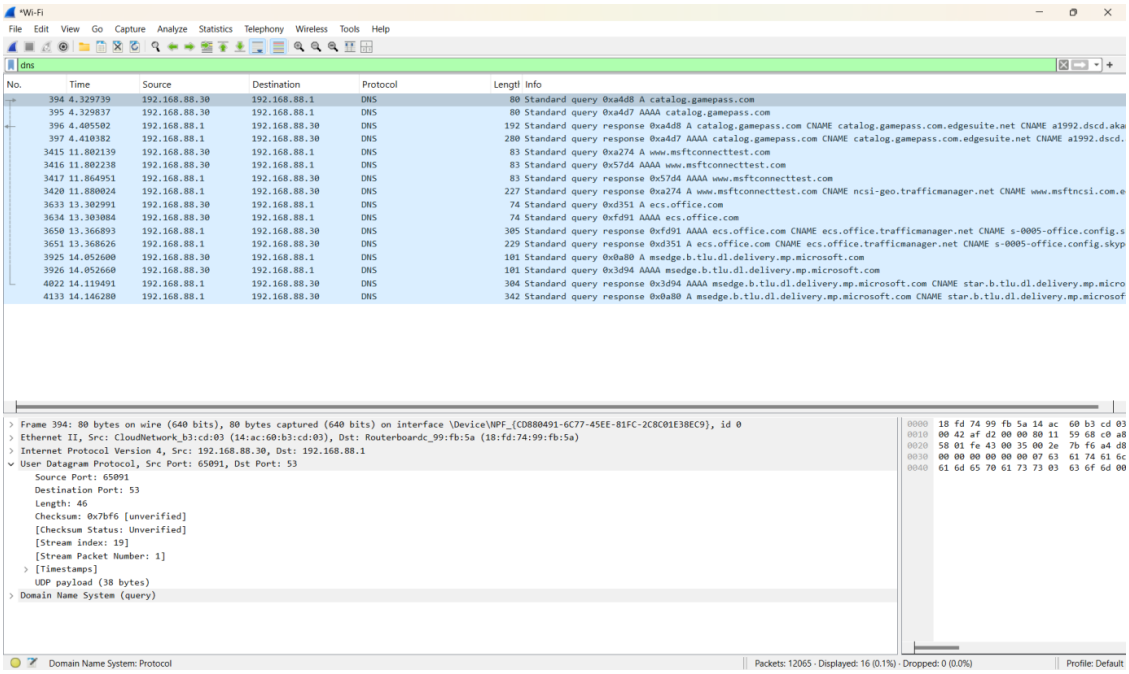
6. Locate the DNS query and response messages. Are then sent over UDP or TCP? Include a Wireshark screenshot to justify your answer. *1 point*

   As you can see from the screenshot below, the DNS query and response messages are sent over **UDP**. This can be observed in the packet details section, where the User Datagram **Protocol (UDP)** is specified as the transport protocol.



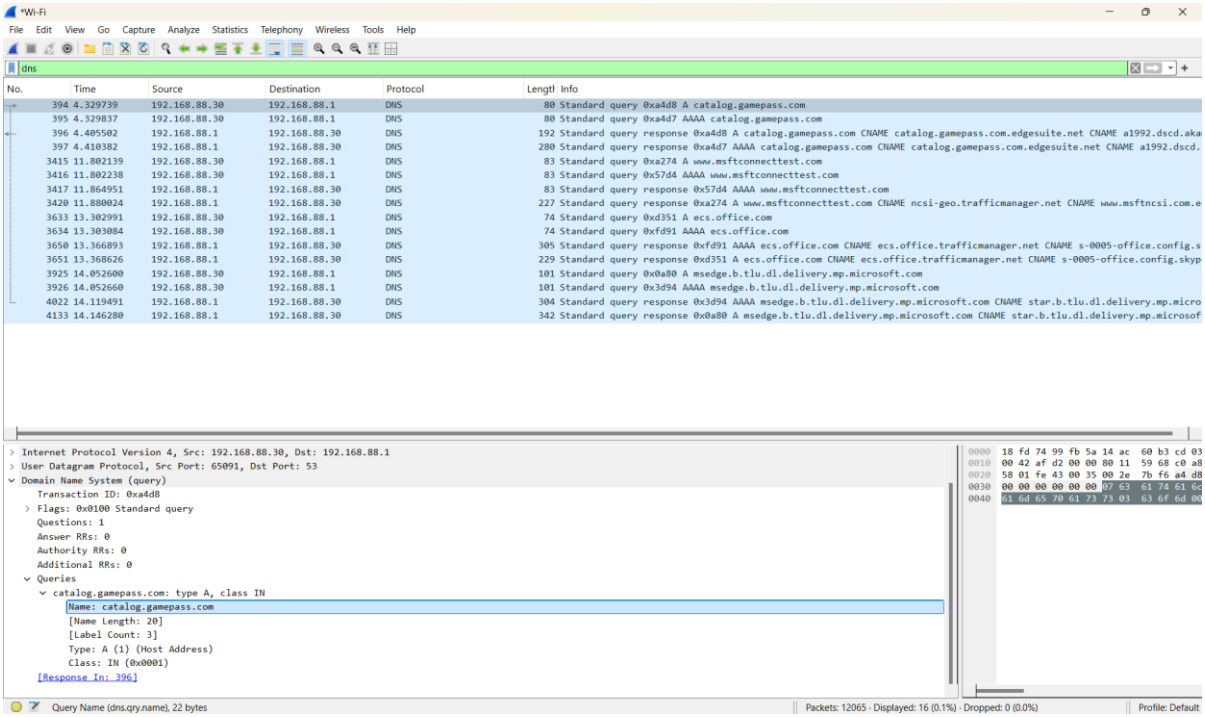
7. What is the destination port for the DNS query message? Include a Wireshark screenshot to justify your answer. *1 point*

   As you can see from the screenshot below, the destination port for the DNS query message is **53.**



8. Examine the DNS query message. What "Type" of DNS query is it? Include a Wireshark screenshot to justify your answer. *1 point*

   As you can see from the screenshot below, the DNS query message is of **Type A (Host Address)**.



9. Examine the DNS response message. How many "answers" are provided? What do each of these answers contain? Include a Wireshark screenshot to justify your answer. *2 points*

   As you can see from the screenshot below, the DNS response message provides **4 answers**. Each answer contains the following:

   1. **catalog.gamepass.com**: CNAME, alias for catalog.gamepass.com.edgesuite.net.
   2. **catalog.gamepass.com.edgesuite.net**: CNAME, alias for a1992.dscd.akamai.net.
   3. **a1992.dscd.akamai.net**: Type A, IPv4 address **23.39.210.17**.
   4. **a1992.dscd.akamai.net**: Type A, IPv4 address **23.39.210.18**.

   These records represent a chain of aliases (CNAME) and two IPv4 addresses (A records) that resolve to the requested hostname.