# CSC 120 Lab 07

Instructions:

- Please refer to the lectures posted and the textbook in order to answer these questions.
- Provide screenshots wherever applicable.
- For programming questions, please provide a screenshot and a link to Google Colab
- You may refer to online sources for exploration but do not directly copy paste from these sources.

1. **Question 1: What is the difference between UDP and TCP protocols? Which layer of the OSI model do these protocols belong to? Provide differences in a table.**

   **(10 points)**

2. **Question 2: List the layers in the OSI model and provide one service, application or example provided by each layer.**

   **(10 points)**

3. **Question 3: What is the difference between HTTP and HTTPS? What is encryption and what is its benefit ?**

   **(10 points)**

4. **Question 4: Write a brief definition for ports and sockets. What is the port number for email?**

   **(10 points)**

5. **Question 5: What are the risks when connecting to a public wifi network such as a coffee shop, airport, hotel wifi network. What happens if you connect to a website using http vs https over such a network**

   **(10 points)**

6. **Question 6: In this section, we will find the IP address, MAC address of our machines. For this section, we will open the command prompt or terminal on**

**our laptops/PCs.**

**(10 points)**

**Step 0:** Open command prompt on your machine. For Linux, Mac users, this is called the terminal. For Windows, it is called the command prompt.

**Step 1:** For Linux, Mac, run the command `ifconfig` in the terminal. For Windows, run the command `ipconfig` in the command prompt.

**Step 2:** Find the Wi-Fi adapter. For Windows, this should be labeled as Wireless LAN adapter Wi-Fi. For Mac, this will be labeled as `en1`.

**Step 3:** What is the IPv4 address of the Wi-Fi adapter you found above?

Note: Never provide your MAC address or default gateway to strangers. Hackers use this information to gain access to your computer and run malicious scripts that may delete or steal your data.

7. **Question 7: In this section, we run a ping command to an existing server. For this section, we will open the command prompt or terminal on our laptops/PCs.**

   **(10 points)**

**Step 0:** Open command prompt on your machine. For Linux, Mac users, this is called the terminal. For Windows, it is called the command prompt.

**Step 1:** For Linux, Mac and Windows, run the command `ping www.google.com` in the terminal.

Note: You can exit the command by pressing Ctrl+C on your keyboard.

**Step 2:** Write 2-3 lines about the ping command and what it does.

**Step 3:** Paste a screenshot of the output.

Note: Never provide your MAC address or default gateway to strangers. Hackers use this information to gain access to your computer and run malicious scripts that may delete or steal your data.

## 8. Question 8: Connect to your router. (10 points)

We will find out more information about the router in your home. This router has an IP address which it uses to connect to devices. The objective of this question is to find the address of your router and make a note of the settings you can change from this interface.

1. Find your router IP address. Use PCMag's guide to find out how to access your gateway. Note: You will need to login. Generally the default login and password for your router will be found on the internet. You can change this if you want to secure your router but make sure you remember the new password.
2. Questions:
    a. What is the frequency of your network?
    b. How many bands or channels are available for that frequency?
    c. What is the bandwidth of the connection?
    d. Can you change your Wi-Fi password from this interface?
    e. Can you change your email password from this interface?
3. General tips:
    a. The login for default gateway is generally username: admin, password: password. Search the internet for default login instructions.

Note: Never provide your MAC address or default gateway to strangers. Hackers use this information to gain access to your computer and run malicious scripts that may delete or steal your data.

## 9. Question 9: Python program to make a simple GET request.

## (20 points)

Definitions: An HTTP request is made by a client, to a named host, which is located on a server. The aim of the request is to access a resource on the server. An HTTP response is made by a server to a client. The aim of the response is to provide the client with the resource it requested, or to inform the client that the action it requested has been carried out, or to inform the client that an error occurred in processing its request. (Defn. from IBM docs)

Run the following code and answer the questions.

```
import requests

response = requests.get('https://example.com')
print(response.status_code)
print(response.headers['Content-Type'])
```

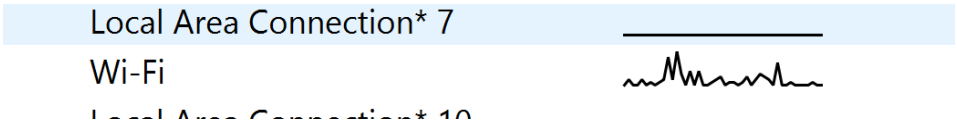
```
200
text/html; charset=UTF-8
```

1. What is the meaning of status code 200?
2. What is the meaning of status code 404?
3. Write a condition that prints “SUCCESS” if a status code is 200. If not, print “Error”. Paste the output screenshot. Use if...else..
4. Replace the URL https://example.com with a website of your choice. Run the code again with the updated website and print out status code and headers. Website Options: `http://www.nytimes.com`

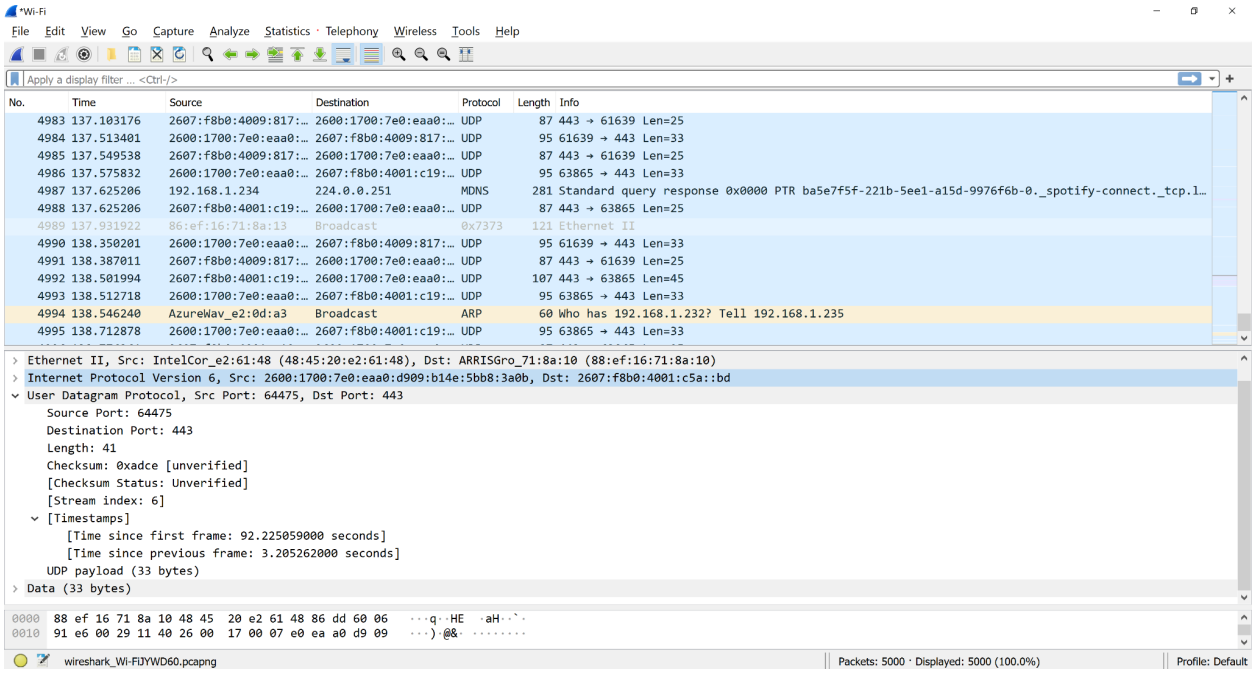
## Additional exploration for interested students (No credit)

1. What is Wireshark? Hint: Refer to the docs at https://www.wireshark.org/docs/wsug_html_chunked/ChapterIntroduction.html to answer the question.
2. Do a quick search and name two other packet analyzers.
3. What is latency, bandwidth and throughput for a network?
4. What is the size of an IPV4 address, What is the size of an IPV6 address.
5. How many unique addresses are available for an IPv4 address?
6. What are firewalls?
7. What is DHCP?
8. What is DNS?
9. Explain the difference between private IP vs public IP
10. Explain the difference between static IP and dynamic IP

11. Install Wireshark.
    a. Locate Wi-Fi in the list of interfaces shown on the Wireshark opening page. Click on it.




    b. Observe the packets and click on one that says UDP in the protocol column.
    c. The information for this packet will be shown in the window below. Click on the dropdown called User Datagram Protocol.




**Instructions: Upload the file with the screenshot on Blackboard with your firstname_lastname.docx**