Q1. Write a TCP server and a client for the following:

1. The server as a command line argument accepts the port number to which it should bind. (2 marks)
2. The client, as command line arguments, accepts the IP address and the port number at which it will find the server. (2 marks)
3. After connecting to the server, the client reads your campus id (3112xxxxxxx) from the standard input and sends it to the server. (the campus id is 311<your year of joining><last 4 digit of your id>. For example, if your roll number is 2017A7PS0007G, then your campus id is 31120170007) (2 marks)
4. The server prints the received campus id and then calculates the value of *y* using the following equation y = (campusId%((campusId%599)+(campusId%599))/3)+98 (1 mark)
5. In the math.txt file, there are multiple equations separated by semicolon (;). From the file, extract the equation whose index is y obtained in step 4. For example if the math.txt file has a;b;c;d and the value of y is 2, then extract the equation c from the file. (HINT: ; is the delimiter) (2 marks)
6. The server solves the equation and sends the answer to the client. (2 marks)
7. The server takes the student's first name as input. If all alphabets are in lower case, then the server sends the name to the client. (2 marks). If the alphabets are not in lower case, the server prints an error message on the console and asks for the input again until the input is provided in lower case (2 marks).
8. The client displays the <name>,<campus id>,<y> on its screen and exits. Replace <name> <campus id> and <y> with actual values. (1 mark)
9. The server is ready to accept a new client (2 marks)

What to submit:

1. A fully working client.c and server.c code
2. A readme file containing instruction to run your code. Please mention your 11 digit campus id in the first line of the readme file.
3. Screenshots for both client and server showing each step mentioned above

Q2. Wireshark assignment:

Using the pcap file provided, answer the following questions:

1. What is the IP address of the local machine (the client) that is connecting to origin servers? Find the number of http requests sent by the client. (1+1 mark)
2. How many http responses are received by the client? (2 marks)
3. Find the size of frame received as response for accessing www.sougata-sen.com. (2 marks)
4. Provide screenshots to show the steps taken to display destination and source PORT as columns in your Wireshark UI. (1 marks)
5. What is the RTT for the request sent to www.sougata-sen.com (1 mark)
6. Take a screenshot of the raw TCP header of response received from www.sougata-sen.com. What is the hex value of the destination port number that you can see in this response (2 marks)

What to submit:

1. A text file containing the answer to Q2.1, Q2.2, Q2.3, Q2.5, Q2.6
2. A screen shot for each of the questions Q2.1 to Q2.6