**CS 330 – Computer Networks**

**Network Programming Project**

**DUE: May 15th (By 11:59pm)**

The goal of this assignment is to implement a TCP client and server. You can use either C or Java. Your TCP client/server will communicate over the network and exchange data.

The server will start in passive mode listening for a transmission from the client. The client will then start and contact the server (on a given IP address and port number). If the server is down then the client must display the following message:

“Server is down, please try later.”

If server is running, then the client will ask the user to input the following commands:

B: to convert to binary

H: to convert to hexadecimal

Q: to quit the client program

If the command is not quit, then the user should input a number to be converted to (Binary/Hexadecimal). The client should display appropriate messages for input errors. If input is correct, then the client will pass the server a request. The request has two parts, a letter and number. The letter is either B to convert the number to binary or H to convert the number to hexadecimal.

On receiving a request from the client, the server should convert the number to the equivalent value in binary or hexadecimal based on the received request and return it to the client. Of course the server must check for errors and respond with one of the following messages:

|  |  |
| --- | --- |
| **Message** | *Description* |
| **200 01001100 or 1034AF** | *Ok and the number is based on the request(B/H)* |
| **300 Bad request** | *Missing B or H* |
| **400 The number is missing** | *Missing the number* |
| **500 Request is empty** | *Missing both the letter and number* |

The server should not output anything on the screen.

Upon receiving the server’s response, the client will display the equivalent value in binary or hexadecimal if the code is 200. Otherwise if the code is not 200 then the error message must be displayed.

*Note that the client code and server code should not be on the same host. Your work should demonstrate that the client and server can communicate using a network connection.*

*You may use any programming language to write the code. You may work in teams where the maximum number of students is 3.*

**Your submission should include the following:**

**1. Report: A well-structured and formatted report containing:**

**a) Steps for socket programming client-server connection for TCP.**

**b) Your project code and comments.**

**c) Snapshots of the application outputs.**

**d) Problems that encountered you and how you fixed these problems.**

**2. A clear demo video of you running your program with different cases.**