CS3205 - Computer Networks Lab
Lab 1: Echo, Math. and Simple File Servers

Instructor: Krishna M. Sivalingam
Assigned on: *Jan. 31, 2023*
Due on: *Feb. 12, 2023, 11.45PM on Moodle*

1 UDP based Echo Server and Client

Modify the UDPtimed/UDPtime routines to convert them to a simple echo server and client.

2 UDP based Math Server

In this part of the assignment, the goal is to write a UDP-based client and server. The server implements a simple mathematical calculator. The client sends a message that contains a mathematical operation to be done. The server performs the necessary computation and replies with the result.

Assume that both operands (`op1` and `op2`) are integers; and that all operators are binary and the operation is `op1 operator op2`. The return value is an integer (suitably truncated). The operators to be implemented are: `add, mul, mod, hyp`

The `hyp` operator computes $\sqrt{\text{op1}^2 + \text{op2}^2}$.

Server	Client
`% ./Mserver 5666`	
	`% ./Mclient localhost 5666`
	`Enter command: add 34 56`
`Received: add 34 56`	`Answer from server: 90`
	`Enter command: mul 34 56`
`Received: mul 34 56`	`Answer from server: 1904`
	`Enter command: mod 22 6`
`Received: mod 22 6`	`Answer from server: 4`
	`Enter command: hyp 3 4`
`Received: hyp 3 4`	`Answer from server: 5`

3 TCP based Simple File Server

In this part of the assignment, the goal is to write a TCP based client and server. The client sends a message that contains a `filename` and a number N that denotes the number of bytes requested. Assume that file size is greater than or equal to N. The server will send the **LAST** N bytes of the specified file (assume that it is in its current directory). If the file does not exist, the server sends a special message "SORRY!".

The client will save the received bytes in a file with name `filename1` in the current directory. If the file does not exist in the server, the client will print the message: "Server says that the file does not exist."

Assume that the files only contain regular printable text characters.

4 What to Submit on IITM Moodle

A single tar.gz file with name ROLLNO-Lab1.tgz containing:

- Source files and Makefile
- A README File that explains how to compile and run the program; whether your programs works correctly or whether there are any known bugs/errors in your program.

5 Grading

- Echo Server: 8 points
- Math Server: 27 points
- Simple File Server: 50 points
- Viva Voce Exam: 15 points

6 Policies

- This is an INDIVIDUAL assignment. Please refer to first day handout (on Moodle) regarding penalties for any form of academic dishonesty, plagiarism, etc. There should be no downloaded code.
- Software for checking plagiarism the code will be used.
- The program can be written in C/C++/Java/Python.
- Sample code for writing UDP clients and servers can be found from various sources including Comer's text used in the book. In the source code, please acknowledge the sources used.
- Reference URL for C:

  `https://www.cs.purdue.edu/homes/comer/netbooks.html`
- Reference URL for Python (not tested by instructor):

  `https://www.digitalocean.com/community/tutorials/python-socket-programming-server-client`
- Book: Internetworking With TCP/IP Volume III: Client-Server Programming and Applications, Linux/POSIX Socket Version (with D. Stevens), 2000. 0-13-032071-4
- Book: Internetworking With TCP/IP Volume III: Client-Server Programming and Applications, BSD Socket Version (with D. Stevens), Second Edition 1996. 0-13-260969-X