List of Projects

1. **FTP Client Implementation**

Maximum students are 3

Implement the basic functions of FTP system:

+ Authentication process (1 point)

+ "ls" command (1 points)

+ "get" command (1 points)

+ "put" command (1 points)

+ "quit" or command (1 points)

+ Your Client program must have a GUI (1 point) and a user uses this GUI to interact with a FTP Server

Please see this link [Basic FTP Commands (colostate.edu)](colostate.edu) for common commands of FTP in detail.

Advance:

+ For each extra command or function implemented, 1/10 will be added into your grade.

Your maximum grade is 10 so please don't implement too many commands.

2. **FTP Server Implementation**

Maximum students are 3

Implement the basic functions of FTP system:

+ Authentication process (1 point)

+ "ls" command (1 points)

+ "get" command (1 points)

+ "put" command (1 points)

+ "quit" or command (1 points)

+ support many clients simultaneously (1 points)

Server doesn't need a GUI but must have a database which information of accounts is stored such as name, password.

Please see this link Basic FTP Commands (colostate.edu) for common commands of FTP in detail.

Advance:

+ For each extra command or function implemented, 1/10 will be added into your grade.

Your maximum grade is 10 so please don't implement too many commands.

3. **SMTP Client Implementation**

Maximum students are 3

Implement the basic functions of SMTP:

+ Authentication process (1 points)

+ Sending process: SMTP Client sends an email to SMTP by using SMTP interaction in textbook "Computer Networking: A top-down approach" chapter 2.3.1 page 147-148 (3 points).

+ QUIT command (1 points)

+ Your Client program must have a GUI (1 point) and a user uses this GUI to interact with a SMTP Server

Advance:

+ For each extra function of SMTP, 1/10 will be added into your grade. For example, your grade is increased by 1 if your SMTP client supports to send attached files.

Your maximum grade is 10 so please don't implement too many functions.

4. **POP3 Client Implementation:**

Maximum students are 3

Implement the basic functions of POP3:

+ Authentication process (1 point)

+ LIST command (2 points)

+ RETR command (1 points)

+ QUIT command (1 points)

+ Your Client program must have a GUI (1 point) and a user uses this GUI to interact with Mail Server.

Advance:

+ For each extra function which your POP3 Client supports, 1/10 will be added into your grade. For example, deleting emails, …

Your maximum grade is 10 so please don't implement too many functions.

5. **DNS Server Implementation**

Maximum students are 3

Description: Create a simple DNS (Domain Name System) server that can map domain names to IP addresses and respond to client queries.

Implement the basic functions of DNS Server:

+ Implement basic DNS resolution: convert domain names to IP addresses and reverse (2 points)

+ Automatically provide a new IP for a new computer when it joins the network of DNS Server (2 points)

+ Store mappings of domain names to IP addresses in a local database (1 point)

+ Support many clients simultaneously (1 points)

Advance:

+ For each extra function implemented, 1/10 will be added into your grade. For example, supporting IPv6, supporting many query types, …

Your maximum grade is 10 so please don't implement too many functions.

6. **Simple Chat Application (Client-Server)**

Maximum students are 6

Description:
Develop a simple chat application where multiple clients can communicate with each other in real-time using a client-server architecture.

Implement the basic functions of Chat application:

+ Client must have a GUI to chat (1 point)

+ Server has a database of clients which contains information of accounts such as name, passwords (1 point)

+ Registration or deletion a user (1 point)

+ Authentication process (1 point)

+ Provide text-based communication between two users (one-one) (1)

+ Provide text-based communication between many users (group chat) (1)

Advance:

+ For each extra function which your application supports, 1/10 will be added into your grade. For example, sending files, sending icons, voice chat, securing messages, …

Your maximum grade is 10 so please don't implement too many functions.

7. **Networked Multiplayer Game Tic-Tac-Toe (Server and Client)**

Maximum students are 6

Description: Build a multiplayer game where players can connect over a network and play a game Tic-Tac-Toe (3x3)

Implement the basic functions of game application:

+ Real-time gameplay between two players over a network (3 points)

+ Client must have a GUI to play (1 point)

+ Server support many Clients simultaneously (1 point)

+ Server has a database which store the information of users: name, password (1 point)

Advance:

+ For each extra function which your application supports, 1/10 will be added into your grade. For example, increasing size of game (9x9), supporting game chat, supporting ranking of users….

Your maximum grade is 10 so please don't implement too many functions.

Some notes:

You must use <u>Java language</u> to implement <u>your applications</u> and use only basic libraries for <u>network communication</u>: java.net.* and java.io.*. For GUI you can use any libraries you want.

You should test your applications with a third-party software to guarantee all functions correctly.

Cheating:

Projects must be your group own work. You may discuss general ideas with other group, but should not discuss actual code with others. If you are having problems with your project, please come and see me or send me an email.

AI-generator tools are not allowed. You can use it as a mentor but don't copy their codes