جامعة الأقصر
كلية الحاسبات والمعلومات
قسم تكنولوجيا المعلومات

Lab Assignment 2

Level: 4-IT/CS **Subject: Network Programming** **Semester: First 2023/2024**

Q1) Implement the following network applications with socket programming in java using multithreading TCP servers. Use different multithreading techniques:

1. A network application consists of a client and a server. The client sends a message to the server which receives and prints it on its console.

2. A network application consists of a client and a server. The client sends a message to the server which receives and prints it on its console, then the server converts it to uppercase and sends it back to the client who receives the message and prints on its console.

3. Implement a TCP Server that Run in Infinite Loop handling Multiple Client Requests, one at a time. The server receives a number N from the client then it calculates its factorial (N!) and sends back the result to the client. Test your server with multiple clients' connection requests. A client should get the number N from the user, don't hard code the number inside the client.

4. Develop a network application with the client-server architecture in which the server solves a quadratic equation of the form ($ax^2+bX+c=0$). The clients send the coefficients a, b, and c to the server in one message and receive the result from the server in one message. The client should prints the result on the console. Also the client should get the coefficients from the user. The server must run in an infinite loop waiting for clients' requests.

Hints:

- To get data from the user use the java Scanner class.
- Calculate the factorial of a number N using this formula: n! = n × (n - 1)!, use java loops.
- Use the formula x = (-b ± √(b2 - 4ac)) / 2a to solve a quadratic equation.
- To convert a string to an integer use the java Integer.parseInt(string) method.