Computer Network Course Practice

P-1: A Socket-based Farm Monitoring System

Requirements:

In this project, students will learn the important skill of distributed programming using socket programming. Socket programming is very cool and the basis of the vast majority of Internet programming.

The background to this programming idea is that a client can interacts with a sensor and gets real-time sensor readings, such as temperature, humidity, and light. Here the "sensor" is the server software.

The Farm Monitoring System simulates a smart farm. It enables users to monitor the operation of the farm, learn about changes in temperature, humidity, and more.

Student will write a TCP or UDP client and a TCP or UDP server. The client can retrieve temperature, humidity and light data from the remote server.

The client should connect to the server, stay connected, and retrieve a number of readings. The client can periodically request readings from the server as many times as you want.

The server is responsible for accepting concurrent client connections, reading 3 data files - humidity.dat, light.dat and temperature.dat, and sending out the right data to the requested clients according to the commands sent by clients. You can define the commands, such as read the latest all or just humidity, light or temperature data, read all or just humidity, light or temperature data in last week. You can input more data to these 3 data files.

The format of date and time is yyyy-mm-dd hh:mm:ss. Data returned by the server are like:

2022-05-06 17:00::00 TEMPERATURE = 60 HUMIDITY = 0 LIGHT = 1.