Requirements Document – P1.3

ECE 3740 – Ken Ferens – Fall 2017

Assignment 1.3

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1. INTRODUCTION

1.1 Purpose of the Requirements Document

This document clearly states the requirements of ECE3740 Assignment 1.3. The software written must conform to these requirements. The general function of the software is to start a server on an MX7CK board, which a client can then access via a telnet client. The client should be able to toggle the board's LEDs, and monitor the states of the push buttons via a command line interface.

2. REQUIREMENTS

2.1 Functional Requirements

R1. The software shall start a server on port 7777.

R2. The server shall accept a Telnet client to connect on port 7777 via direct Ethernet connection, without user verification.

> R2.1. The user shall be able to connect to the server via a command line on a Windows machine, using the command line interface for the telnet program.
>
> R2.2. The user shall not be prompted to log in.
>
> R2.3. The user shall only be able to connect to the server via a direct Ethernet connection between the user's computer and the MX7CK board.
>
> R2.4. The server shall only allow a single user to connect at a time.

R3. The software shall display a help menu as soon as the user connects.

> R3.1. The menu shall list all of the commands that the user can enter.
>
> R3.2. The menu shall be displayed in ASCII text on the Windows command line once the user has connected.

R4. The server shall accept a connected user's input through the telnet interface on the Windows command line to toggle the LEDs, and monitor the state of the push buttons.

> R4.1. The server shall turn LED1 on if the user types the command LED1 and hits enter. Conversely, the server shall turn LED1 off if the user enters ~LED1.

R4.2. The server shall turn LED2 on if the user types the command LED2 and hits enter. Conversely, the server shall turn LED2 off if the user enters ~LED2.

R4.3. The server shall turn LED3 on if the user types the command LED3 and hits enter. Conversely, the server shall turn LED3 off if the user enters ~LED3.

R4.4. The server shall turn LED4 on if the user types the command LED4 and hits enter. Conversely, the server shall turn LED4 off if the user enters ~LED4.

R4.5. The server shall return the state of BTN1 when they type and enter the command BTN1.

R4.5.1. If BTN1 is depressed at the time the user submits the BTN1 command, the server shall respond that BTN1 is pressed.

R4.5.2. If BTN1 is NOT depressed at the time the user submits the BTN1 command, the server shall respond that BTN1 is NOT pressed. .

R4.6. The server shall return the state of BTN2 when they type and enter the command BTN2.

R4.6.1. If BTN2 is depressed at the time the user submits the BTN2 command, the server shall respond that BTN2 is pressed.

R4.6.2. If BTN2 is NOT depressed at the time the user submits the BTN2 command, the server shall respond that BTN2 is NOT pressed.

R4.7. The server shall return the state of BTN3 when they type and enter the command BTN3.

R4.7.1. If BTN3 is depressed at the time the user submits the BTN3 command, the server shall respond that BTN3 is pressed.

R4.7.2. If BTN1 is NOT depressed at the time the user submits the BTN3 command, the server shall respond that BTN1 is NOT pressed.

R4.8. The server shall allow multiple LEDs to be on at the same time.

R5. The server shall allow the user to disconnect the direct connection to the MX7CK board.

R5.1 A connected user shall be able to type (without quotes) “q”, and hit enter to close the connection to the server.

2.2 Quality Requirements

R6. The server shall accept a user’s connection and display the menu in approximately 100ms.

R7. The server shall process and respond to any of a connected user’s commands in at most 100ms.

2.3 Platform Requirements

R8. The software shall be written in the C language.

R9. The server shall use the TCP/IP stack code given in class.

R10. The server shall run on a Microchip MX7CK board.

2.4 Process Requirements

There are no clear process requirements for this assignment.

2.5 Ecological Requirements

There are no clear ecological requirements for this assignment.

3. REFERENCES

K. Ferens, “ECE 3740 Systems Engineering Principles 1,” 15 September 2001. [Online]. Available: http://ece.eng.umanitoba.ca/undergradutate/ECE3740/. [Accessed 17 September 2017].