Microprocessors Midterm Project Hardware

Design an 8088-microprocessor based system to transmit and receive data. The data received should be displayed on 16x2 LCD display [1]. The system includes a 4x4 keypad, through which, the user can enter numeric values to be sent serially. The memory system organized as follows; an EPROM contains the BIOS (you select the size of the EPROM) and a RAM that covers three areas as shown in the table below:

Memory Chip Size	Starting Address
64 KB	00000 H
128 KB (Consisting of four 32 KB memory chips)	10000H
2 KB, this memory chip serves the transmitter/receiver (TR) such that, the TR reads data from this memory (lower half) and writes data to the upper half of the memory.	30000H

1- Design the system using Proteus [2],[3]
2- Write an 8088 code to read from the keypad and send the it serially.
3- Write the initializing routine for the serial, parallel and LCD display.
4- Clearly depict the IO addresses for every IO device in the system.
5- Write a full report showing your work in detail.

Rubric

Memory Interface Correctly	2-points for each = 8points	
LCD Interface	2-points	
Keypad interface	2-points	
8255 connections and decoding circuit	2-points	
8251 serial interface	4-points	
Proper initializing code for the 8255 and 8251	5-points	
Proper Report writing	4-points	
Total	29 points	

References

[1] In-Depth Tutorial to Interface 16x2 Character LCD Module with Arduino (lastminuteengineers.com)

[2] Download Proteus - Try Proteus EDA Software - Labcenter Electronics

[3] 8086 µProcessor | Proteus Simulation | 7 Segment & Stepper Motor - YouTube