Please read all the pages very carefully to understand the assignment……
You have to follow all these instruction I need to do in my assignment

Deliverable (1)Source Code

1)A correctly functioning program, well commented and presented

2)Appropriate configuration of SFR

3)Appropriate design and implementation of the state machine.

Deliverable (2) Documentation

1)A well documented program to include code explanation

The assignment start from below:-

You are required to design a system that controls the speed of a fan's rotation. The speed at which the fan rotates is determined by the ambient temperature, i.e. as the temperature increases, so does the rotation speed of the fan. The system makes use of a small D.C. Motor connected to a microcontroller via a H-Bridge configuration, so that the direction of the fan's rotation can also be controlled.

As the fan rotates, a small disk attached to shaft of the motor passes through an optical encoder, this facility allows us measure the number of rotations in a specific time, usually measured as Rotations Per Minute (RPM)

The user of the system can configure the speed of rotation for a given temperature. This is achieved by using a 4x4 keypad, along with a 128x64 graphics liquid crystal display, to provide feedback to the user. The initial LCD layout is shown below when normally operating.

Temperature Fan's Rotation
22C 2000RPM
Enter Pin to Change System Parameters

A four digit PIN number is required to gain access to allow configuration of system parameters. The method adopted for entering the pin number, needs to be a non-blocking approach, as the motor's speed needs to be continually monitored and controlled as a background task.
As soon as a the four digits have been entered, validation of the entered pin is required. If the PIN number has been entered incorrectly, an appropriate message needs to be displayed for 3 seconds before returning to the normal operation. A correctly entered pin, will display the configuration menu as below
Please select one of the following
1.

Change PIN number

Stop Motor

Start Motor

Change Direction

Configure Temperature vs RPM

Option 1.
A message asking the user to enter their old PIN number will be displayed. If correctly entered, a new message prompting the user to enter their New PIN number will be shown. Once entered, they will be required to enter it again for verification. When the process is complete, the system will return to normal operation. Any error during this procedure will be displayed before returning to normal operation, keeping the existing pin number.
Option 2.
As it suggests, Stops the motor before returning to normal operation. The motor's speed will need to be ramped down before stopping.
Option 3.
Starts the motor before returning to normal operation where the rotation speed is determined by the ambient temperature. The motor's speed needs to be ramped up to the RPM.

Option 4.
When Selected, the motor will need to stop rotating before the direction is changed. It restarts the motor in the opposite direction before returning to normal operation. Again the speed needs to be ramped down when stopping and ramped up when starting
Option 5.
The Fan is required to work over the temperature range 15$_o$C-35$_o$C and for each 1$_o$C change a new RPM value will be required. The RPM is user programmable for any integer temperature in the range specified. The user at this point will be shown the temperatures and RPM values on the display. 'A' on the keypad will allow the user to scroll up, 'D' to scroll down through the RPM values associated with that temperature. Entering a numeric value on the keypad will overwrite the displayed RPM value, storing the newly entered value. Once entry is complete, the '*' will return the system to normal operation.
The expectation for this assignment is for the design of robust, well tested system. That will handle all exceptions, displaying appropriate messages and operate reliably.

Laboratory Assignment 3

The simulation of a field-controlled electric motor

(Open Loop and Closed Loop)

Objectives:

1. To be able to construct simulations using basic Simulink blocks.
2. To be able to derive the transfer function of a field-controlled electric motor, given its differential equation.
3. To be able to simulate the electric motor using Simulink and to obtain its step response.
4. To be able to alter the simulation so that signals of input voltage, of shaft angular velocity and of output shaft angle are obtained.
5. To incorporate the motor into a simulated Remote Position Control Servomechanism. (RPC Servo)
6. To obtain step responses of the RPC Servo for different values of damping coefficient.
7. To construct the Closed Loop Transfer Function of the RPC Servo.
8. To create the Time Response Equation for each condition of damping.
9. To draw a pole diagram on the s-plane and identify the position of the closed loop poles for each condition of damping given.
10. To record the work undertaken and to write a report that includes supporting theory.

Starting SIMULINK:

1. Switch on your computer. After it has booted up, you will see the 'Desktop' displayed with icons of various packages located on it. Identify the MATLAB icon and double-click on it.
2. Once the MATLAB 'Workspace' has appeared with the >> prompt type Simulink and hit return. The Simulink Library Browser will appear. Click on the 'File' icon at the top left and a new Simulink window will appear.

Note: Ensure that you save your simulation, as EM2S01Lab1, after each change that you make to it.