
Wednesday
March 10, 2021

Assignment-1
EE 309: MicroProcessors
Spring Semester 2021

Due on:
March 17, 2021
Before 23:50

Listing for an assembly program which implements keyboard scanning for a 4x4 keyboard using the FSM approach is attached as a separate file. In the supplied version, the program has empty test and action routines.

Q-1 Compile and run the program (with empty routines) under Keil debugger after making small modifications to the code and setting different values for F0 and current state etc. by hand, so that in different runs it jumps to different parts of the interrupt service routine after initialization.

Describe its operation and its data structure in a brief (< 2 page) document.

Q-2 The program needs 2 test routines – AnyKey and TheKey. AnyKey sets the flag F0 in PSW if any key is pressed and clears it otherwise. TheKey set the flag F0 in PSW if the key corresponding to the variable PressedKey is currently pressed and clears it otherwise. (These are very small routines).

It also needs the three action routines. The DoNothing routine does not need any modification. FindKey should find which key is pressed and write its key code to the variable PressedKey. ReportKey should insert the code for PressedKey in a circular data buffer (FIFO) of 8 bytes.

Write efficient code to replace the empty functions in the supplied code.

Q-3 Run the completed program as you had done in the first question above.

Assignment Ends

Your submission should have an asm file with code and a pdf file for text answers.

Key codes are in one hot format – upper nibble has a ‘0’ in the bit corresponding to the row and the lower nibble has a ‘0’ in the bit corresponding to the column of the pressed key.