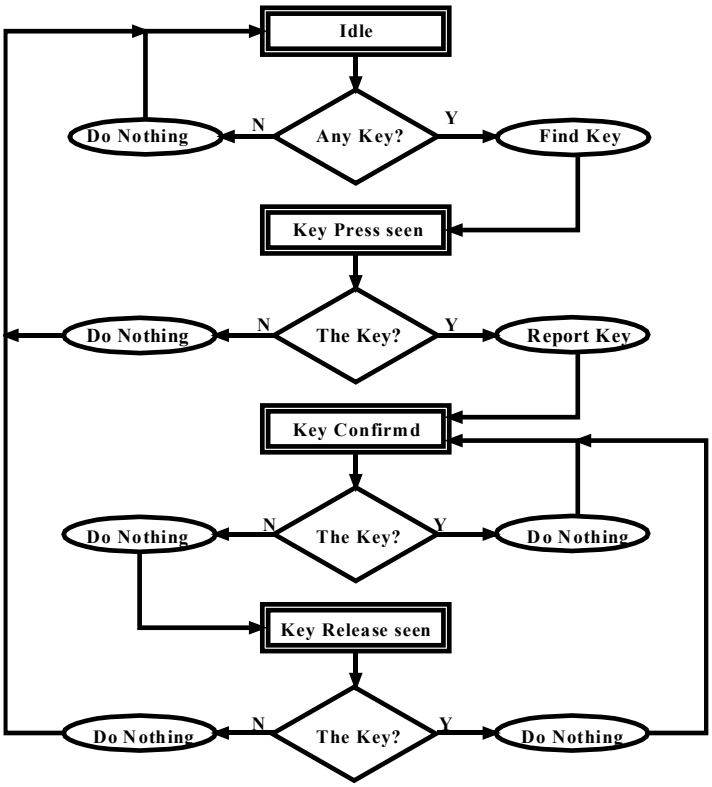
Assignment 1: Keyboard FSM

Rathour Param Jitendrakumar
190070049
EE-309, MicroProcessors
March 17, 2021

We are using an FSM based approach to perform Keyboard Scanning.
A timer interrupt (T0) happens every 25ms, which checks for a keypress. We keep performing actions that track current states and then return from interrupt as soon as one transition to the next state occurs. After returning processor can continue doing its task.

FSM is used to avoid debouncing. There are
4 states – Idle, Keypress seen, Keypress confirmed, Keypress released
3 actions – Donothing, Findkey, Reportkey
2 test routines – AnyKey, TheKey
Stored in a tabular data structure (Appropriate labels should be given to them)



State	Test
0	0
1	1
2	1
3	1

St.	Yes Case	
	Action	Next St.
0	1	1
1	2	2
2	0	2
3	0	2

St.	No Case	
	Action	Next St.
0	0	0
1	0	0
2	0	3
3	0	0

States: 0:Idle 1:Press 2:Conf. 3:Release
Tests: 0:AnyKey 1:TheKey
Actions: 0:Nothing 1:FindKey 2:ReportKey

Program Operation –

- Interrupt occurs
- Stop, reload, start timer 0
- Then jump to FSM subroutine
    - Acculumator, PSW, DPTR values saved in stack
    - Jump to test for current state by finding from table and current state
        - AnyKey, TheKey
    - Perform actions according to test answer & current state using DPTR
        - Donothing, Findkey, Reportkey
    - Depending on test answer get to next state
    - Acculumator, PSW, DPTR values popped from stack
    - Return to FSM jump
- Return to main function