2DX4: Microprocessor System
PreLab 5

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As a future member of the engineering profession, the student is responsible for performing the required work in an honest manner, without plagiarism and cheating. Submitting this work with my name and student number is a statement and understanding that this work is our own and adheres to the Academic Integrity Policy of McMaster University and the Code of Conduct of the Professional Engineers of Ontario. Submitted by **[Junbo Wang wangj430 400249823]**

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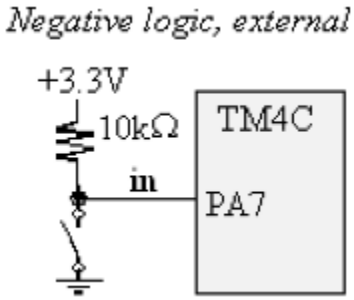
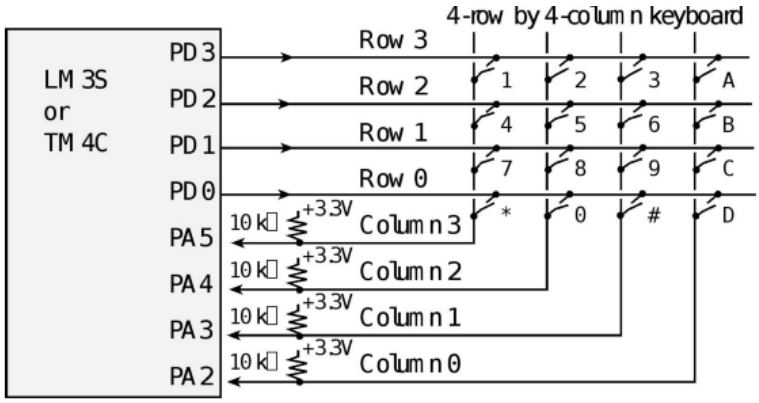
1.



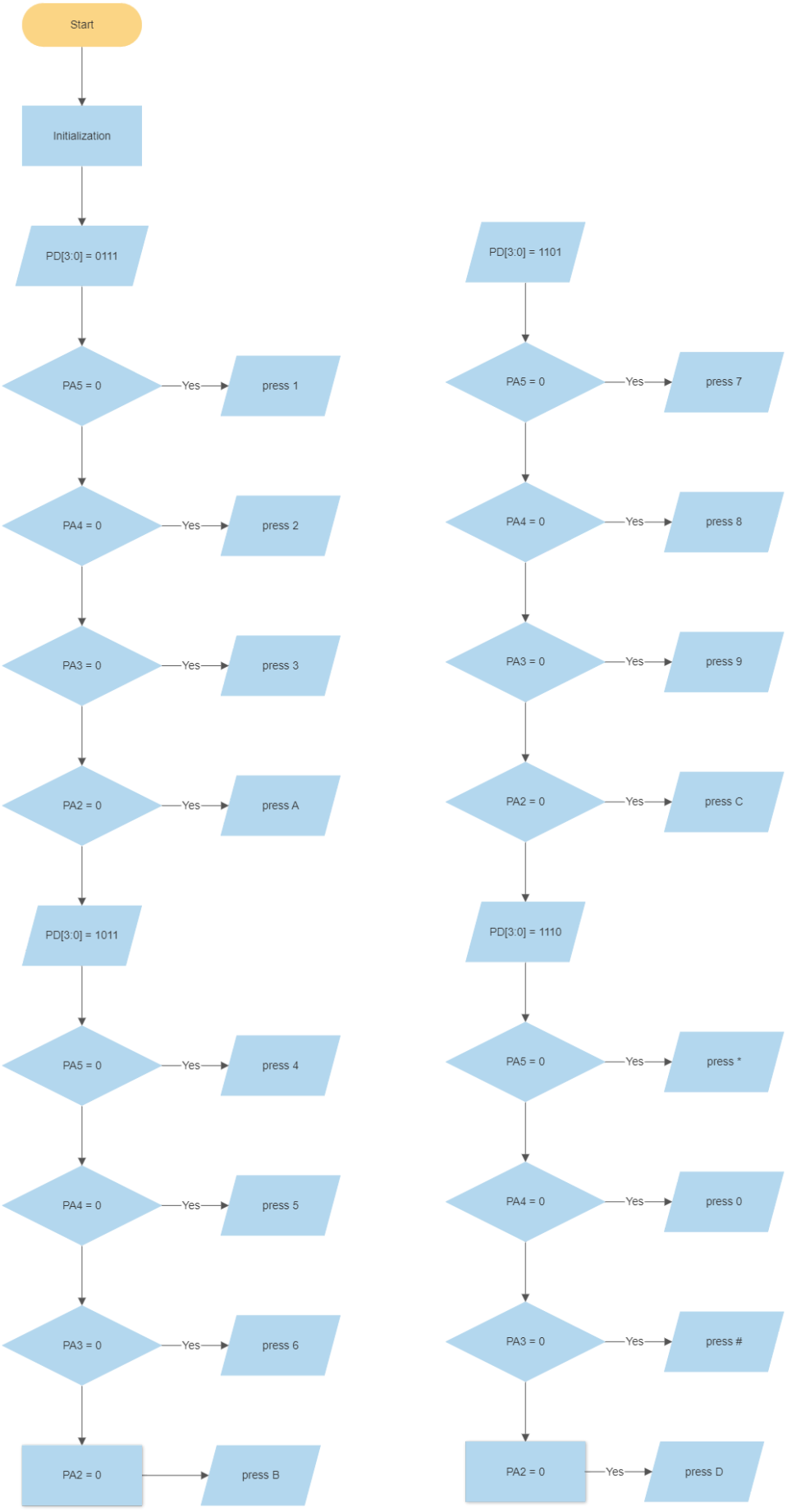
The input pin PA7 in figure 4.12 is negative logic, external. The input receives the value from port A and returns true if the switch is opened and false if it is closed. Thus, we can utilize a bit-specific address to get PA7 or read port A and apply a logical AND to choose bit 7.

2.



The switches are designed as negative logic, external from the figure 8.15 above, because the inputs are high while the switches are open, and low when the switches are closed, the inputs are high.

3.


Start
Initialization
PD[3:0] = 0111
PA5 = 0
Yes
press 1
PA4 = 0
Yes
press 2
PA3 = 0
Yes
press 3
PA2 = 0
Yes
press A
PD[3:0] = 1011
PA5 = 0
Yes
press 4
PA4 = 0
Yes
press 5
PA3 = 0
Yes
press 6
PA2 = 0
press B
PD[3:0] = 1101
PA5 = 0
Yes
press 7
PA4 = 0
Yes
press 8
PA3 = 0
Yes
press 9
PA2 = 0
Yes
press C
PD[3:0] = 1110
PA5 = 0
Yes
press *
PA4 = 0
Yes
press 0
PA3 = 0
Yes
press #
PA2 = 0
Yes
press D