COMP ENG 2DX3
Pre-lab #5

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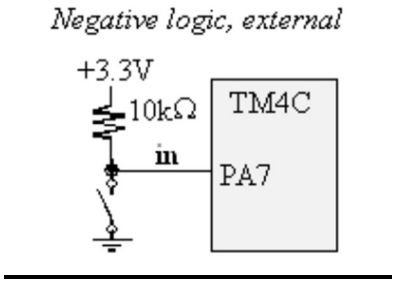
Q1) Referring to textbook section 4.2.2, figure 4.12, from a programmer's perspective explain how the two states of the switch (open, closed) work for negative logic, external. You may assume the port pin is fully pre-configured as an input.

Ans:



When the button is not pressed (switch is open), all current from the 3.3V source, goes into the microcontroller, which means a logic HI goes into the input. When the button is pressed (switch is closed), all the current goes to ground through the switch and the microcontroller input receives a logic LO.

This layout is the same as an Active Low configuration.

Q2) Review textbook figure 8.15. This figure illustrates an electrical structure similar to the lab's Grayhill 96BB2-006-F 4x4 keypad. From the figure, determine if the switches are configured as:

(a) positive logic, external
(b) negative logic, external

Ans:

All the switches are configured as negative logic, external

Q3) Create a flowchart for a program that scans the 4x4 keypad using 4-output and 4-input GPIO pins and identifies which single button has been pressed (assume only one can be pressed at a time)

Ans: