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Mechatronics Laboratory
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Laboratory Task Sheet 04

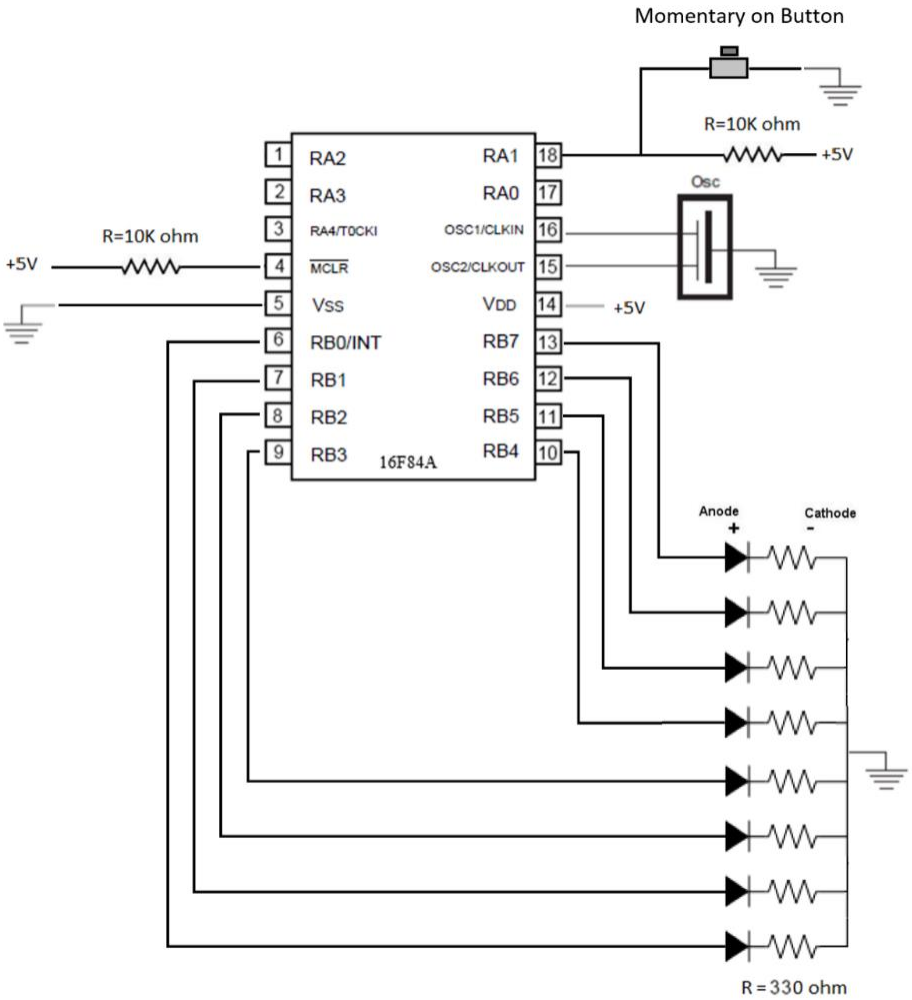
Title: Counting Button Pushes

Registers to be learned: STATUS,Z

Objective: Program the microcontroller such that every time the push button is pressed the contents of a memory file increases by one and the linear array of LEDs displays the value saved in this memory file in binary format. After the displayed value reached decimal 15 pressing the button one more time must turn off all the LED.

Tasks

1. Create the circuit below using a linear array of LEDs, a bank of resistor, and a push button.



2. Make a copy of the P16f84A_Template file and name it TASK04Group00. Open the file in MPLAB Software and use the table below to construct the code.

Suggested Code Structure
Define ByteA as memory file
Start
Call Initialization **Go to Main**
Main Check if the button is pressed If it is not pressed, stay here If it is pressed, go ahead Check if the button is not pressed anymore If it is still pressed, stay here If it is not pressed anymore, go ahead Move the content of ByteA to PORTB to display the value of ByteA on the linear array of LEDs Subtract decimal 15 from ByteA Use STATUS,Z to check if the result of the subtraction is zero If the result is not zero (STATUS.Z=0), Increment ByteA and place the result in the file If the result is zero (STATUS.Z=1), clear ByteA Go to Main
Initialization Bank1 Use TRISA to define PORTA1 as input Use TRISB to define PORTB (all pins) as output Bank0 Initialize PORTB to turn off all the LEDs Clear ByteA return
end

3. Program the microcontroller and test it on the circuit.
4. Demonstrate the result to the instructor.
5. Upload the code on D2L and save it for yourself.