

## Laboratory Task Sheet 05

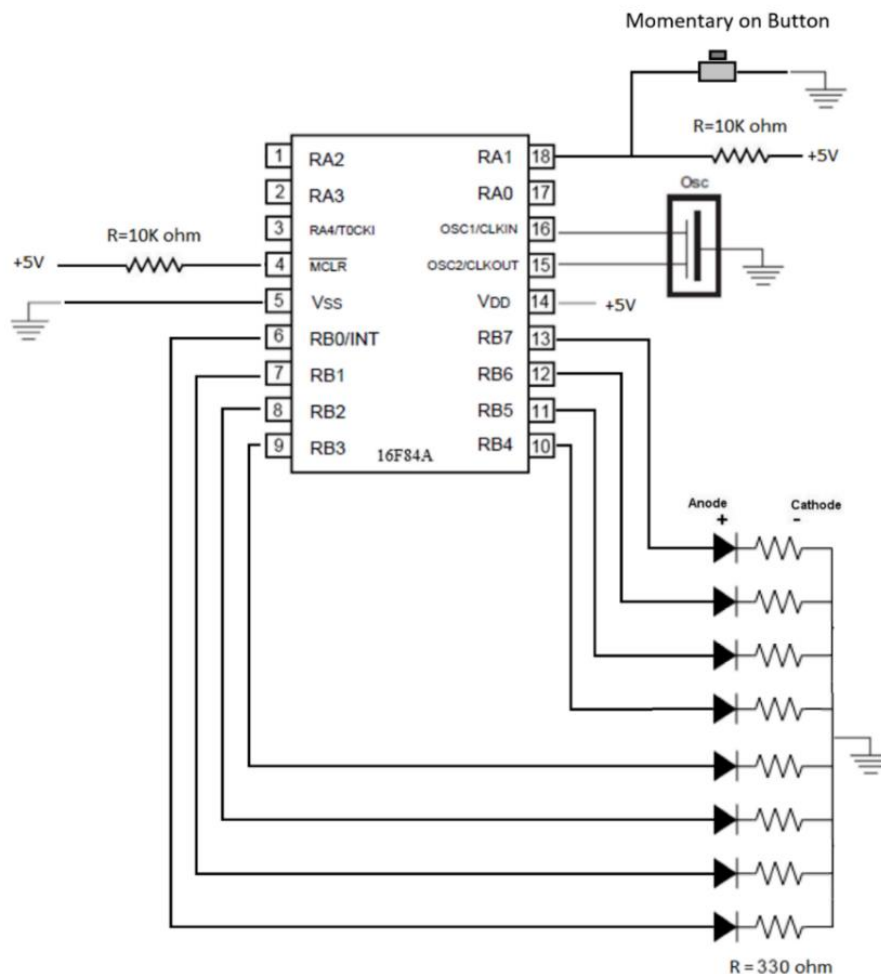
**Title:** Nightrider with Delay

**Registers to be learned:** STATUS,C with rotate file

**Objective:** Program the microcontroller such that by keeping the push button pressed, the linear array of LEDs displays only one active LED at a time, starting from the rightmost LED (PORTB0), **every 200 milliseconds** the active LED shifts one bit to the left. When the active LED reaches the leftmost LED (PORTB7), reverse the direction and consequently when the active LED reaches the rightmost LED reverse the direction again. When the button is not pressed all the LEDs must turn off.

### Tasks

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



2. Make a copy of the P16f84A\_Template file and name it TASK05Group00. Open the file in MPLAB Software and use the table below to construct the code.

Suggested Code Structure
Define ByteA, and ByteB as memory file Define Direction as memory bit
<b>Start</b>
<b>Call Initialization</b> <b>Go to Main</b>
<b>Main</b> Turn off all the LEDs Check if the button is pressed If it is not pressed, stay here If it is pressed, go ahead Turn ON the most right-hand side LED, connected to PORTB0 Clear Direction Clear STATUS C Go to Loop
<b>Loop</b> Call Delay Call CheckDirection Call Rotate Check if the button is still pressed If it is still pressed, go to Loop If it is not pressed anymore, go to Main
<b>CheckDirection</b> Check if the most right-hand side LED, connected to PORTB0, is ON If it is ON, clear Direction Check if the most left-hand side LED, connected to PORTB7, is ON If it is ON, set Direction Return
<b>Rotate</b> Check Direction Based on the value of Direction, rotate PORTB to the left or right and then return
<b>Delay</b> Make a Delay for 200 milliseconds Return

**Initialization**

Bank1

Use TRISA to define PORTA1 as input

Use TRISB to define PORTB (all the pins) as output

Bank0

Initialize PORTB to turn off all the LEDs

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.