

## Lab 4

# PIC Microcontrollers

### Objective

In this lab, using Proteus Design Suite, we will be designing our own circuit so that we can simulate our C code. The simulation in Proteus behaves in the same way as the actual PIC MCUs do. While writing a code for an MCU, the MCU can be damaged. Therefore it is important to simulate your work before uploading your code directly to an MCU. We will be learning how to implement certain input and output capabilities to our code.

### Part 1: Designing a Circuit in Proteus

1. Open Proteus Design Suite Software you have downloaded in the previous lab.
2. Open a new project by following the video. (Save your project in a suitable folder in the *EE321Workspace* folder you have created in Lab 1.)
3. Add the elements such as an MCU, LEDs and resistors; connect them. (Remember to save your work frequently so that you don't lose your work in unexpected circumstances.)

### Part 2: RotatingDot

1. Open MikroC and open a new project. (Save your project in a suitable folder in the *EE321Workspace* folder you have created in Lab 1)
2. Write or copy your RotatingDot C code.
3. Build your MikroC project using the build button above.
4. Add the .hex file (created by MikroC) to the PIC MCU in Proteus.
5. Run the simulation.

### Part 3: KnightRider

1. Create a new project in Proteus and copy the same circuit to Proteus.
2. Create a new project in MikroC and copy the same code to MikroC.
3. Change your RotatingDot C code so that the new program turns on an LED one by one, but changing direction on either sides (KnightRider/Karasimsek).

**Remember** to upload the following to **LMS** by compressing them to a **ZIP** or a **RAR** file:

- 1- Proteus design file
- 2- RotatingDot.c
- 3- RotatingDot.hex
- 4- KnightRider.c
- 5- KnightRider.hex

The files must be uploaded to LMS by **23.55 on March 31, 2020**. The **name** of the compressed ZIP or RAR file must **be your student number: S012345.zip or S012345.rar**

Code sharing is strictly forbidden. Your codes will be correlated and graded accordingly.