

# Fundamentals of Embedded Systems Design & Programming

U.C. Irvine Division of Continuing  
Education

EECS X497.32

Instructor: Saleem Yamani

**Programming Assignment:  
LED ON/OFF program using polling**

# **Programming Assignment: LED ON/OFF using Polling Method**

1. Write a portable code using programming guidelines mentioned in next slide
2. Turn ON and OFF the LEDs continuously with the ON and OFF duration to be approximately between 1 and 2 seconds.
3. Use a software loop to create a delay routine to control the ON and OFF duration
4. DO NOT use the delay library functions provided in the AVR libraries.

# Creating portable code

- For all your graded programming assignments use the following programming guidelines
- Create an include file which contains hardware specific information
  - **Example:**  
**Create a file called devreg.h**  
Include Memory mapped addresses related to the PORT and GPIO's addresses being used  
You will keep adding other PORT and GPIO's addresses on to this file during the course
- **Create wrapper functions** to encapsulate Register Read/Write operations
  - **Example:**  
Create Function **WriteReg**(*RegAddress*, *Value*)  
Create Function **ReadReg**(*RegAddress*)
- **Zip up the full project and send it for submission**  
Do not just send the .c and .h files only

# Programming tips

- When you create the software delay loop, you might experience the loop is exiting very quickly and not creating the desired delay time.
- **HINT:**
  - 1) Use the keyword “volatile” in front of the delay variable used inside the loop  
OR
  - 2) Set zero optimization level in the AVR studio(not preferred)