Department of Electrical and Computer Engineering
University of Massachusetts Dartmouth

ECE160: Foundations of Computer Engineering I (Spring 2023)
Instructor: Dr. Liudong Xing

LAB # 3
(Relevant Lecture: #6, #7)

February 6, Monday (L1) and February 8, Wednesday (L2)

OBJECTIVES

1) To learn how to input data using the standard formatted input function scanf().
   Note that in Visual Studio, scanf_s() is required, which is a safe version of
   scanf().
2) To learn how to output data using the standard formatted output function printf().
3) To learn the use of field specifications in printf()
4) To learn the use of special characters in printf()

SUBMISSION REQUIREMENT

1. Please follow "Submission Guidelines" in the lab section of the course website to
   submit your solution (cpp files) to the class M: drive by **5pm, February 8**. (Note
   late submission of lab assignments is not accepted!)
2. Suggested format for naming your solution files: lab#-your last name-p#.cpp
   For example: lab3-xing-p1.cpp for problem 1; lab3-xing-p2.cpp for problem 2; …

EXERCISES

1. Write down what each printf() statement can output. Then enter, compile and run
   the following C program to confirm your answer.

```c
/* Learn the use of field specifications in the printf() */
#include <stdio.h>
void main(void)
{
        printf("The number%6d wins!\n", 5321);
        printf("The number%06d wins!\n", 5321);
        printf("The number%-6d wins!\n", 5321);
        printf("%d\t%c\t%4.1f\n", 23, 'a', 51.3);
        printf("%d\t%c\t%3.1f\n", 107, 'A', 56.7);
        printf("%d\t%c\t%5.2f\n", 1753, 'D', 151.3);
        printf("%d\t%c\t%f\n", 3, 'c', 0.3);
}
```

2. Enter, compile and run the following C program. After you run this program,
   based on the output from each printf() statement, learn the meaning of each
   special character (\a, \b, \n, \r, \0, \t, \").

```c
/* Learn the use of special characters in the printf() */
#include <stdio.h>
void main(void)
{
    printf("Listen to the beep now. \a");
    printf("\nWhere is the 't' in cat\b?\n\n");

    printf("I earned $50 \rWhere is the money?\n");
    printf("I earned $50 \0Where is the money?\n");

    printf("\nThe rabbit jumps \t\t two tabs.\n\n");

    printf("Print 3 double quotes \" \" \" \n");
}
```

3. Write a program that prints a box as follows:

```
********
*      *
*      *
*      *
*      *
*      *
********
```

4. Write a program that reads the following values using scanf_s() and then prints them out using printf()

   100 100.2   1

5. Write a program that reads the following values using scanf_s() and then prints them out using printf()

   02/07/2022

6. Write a program where you ask the user to enter 3 integer numbers and you print them out one per line in the order the numbers were entered.

   For example: The user entered 3 7 9   Output:

   3
   7
   9