University of Massachusetts, Boston
CS240 – Programming in C
Homework Assignment 1
Submission Date: 5 PM, 28 Feb 2023

Instructions:
- The assignment consists of five programming tasks and one Unix command task.
- Please write your code and save it as a .c file and take a screenshot of the output of your programs.
- You must include comments in your code explaining the purpose of each function and the logic behind it.
- Your homework submission should contain following files in the Gradescope: https://www.gradescope.com/courses/510216
    - Source code for each C programs in .c extension.
    - Screenshot of output of each program separately.
    - Unix-hw.txt
- Late submissions will not be accepted. If extension is needed, please email at least 2 days before deadline with a genuine reason.

Task 1: Factorial
Write a C program that calculates the factorial of a given integer using a for loop. Your program should prompt the user to enter an integer, and then output the factorial of that integer.

Task 2: Calculator
Write a C program that takes two integer values as input and performs the following operations on them:
- Addition
- Subtraction
- Multiplication
- Division
- Modulus

Your program should output the result of each operation.

Example:
Enter expression: 10+5
Result: 15
Enter expression: 10-5
Result: 5
Enter expression: 10*5
Result: 50
Enter expression: 10/5
Result: 2
Enter expression: 10%5
Result: 0

Task 3: Prime or not prime
Write a C program that takes an integer as input and checks whether it is a prime number or not. Your program should output "Prime" if the input is a prime number, and "Not prime" otherwise.

Task 4: Age Calculator
Write a C program that prompts the user to enter their name and date of birth, and then outputs a message saying "Hello, [Name]! You are 18 years, 5 months and 10 days old."
Your program should use variables to store the name and age entered by the user.

Sample Input:
Name: Jon
Date of Birth: 1990/01/01
Sample Output (15 Feb, 2023):
Hello, Jon! You are 33 years, 1 months, and 14 days old.

Task 5: Circle area
Write a C program that calculates the area and circumference of a circle with a given radius. Your program should use a constant value of 3.14159 for pi. Your program should prompt the user to enter the radius, and then output the area and circumference of the circle.

Task 6: Unix Commands
Using the Unix commands, you have learned in class, create the following file structure:
- Create a directory called "unix_hw" in your home directory.
- Within "unix_hw", create a file called "helloworld.c" and a directory called "output".
- Compile your helloworld.c file into output folder.
  This should create an output executable file in output folder.
- Run the helloworld program from output folder.
- Within "output", create a file called "notes.txt".
- Move "notes.txt" to "unix_hw" (using relative path)
- Remove "notes.txt" from output folder. (using absolute path)
- Remove "output" (using absolute path)

Perform above steps on your Unix account, then copy each command your ran into a text file and take a screenshot of your terminal window such that all steps are visible.
Submit the screenshot and unix-hw.txt file on the Gradescope for grading.

Good luck!