CS111 – Introduction to C Programming
(Draft)

Fall 2025
Programming Assignment #2 (2%)
Due: Friday September 19, 2025 (23:59)
Binary Numbers, Printf and C Integer Variables and Operations

Objectives

- Study the conversion between binary and decimal numbers.
- Learn how to declare, define and print C integer and string variables.
- Perform calculations between two integer variables using C arithmetic operators and compound statements.

Part I: Conversion between binary and decimal numbers

(a) Convert the following decimal numbers to binary: 10, 1024, and 1025.
(b) Convert the following binary numbers to decimal: 11110, 1011101.

Part II: Arithmetic addition, subtraction, multiplication and division between integers

1) Refer to the C program template in lecture slides as the starting point of this part.
2) Defines two integer variables, **`i`** and **`j`**.
3) Initialize the i to an arbitrary value, say 78, as a part of its declaration.
4) Define the value of the second variable, say, 56, with an assignment statement.
5) Use the **`printf`** function to display the results of the sum, difference, product and division between **`i`** and **`j`**;
6) Compile and run your code until you see the expected result (e.g., 134, 22, 4368, 1).

In the case of integer division, when two numbers do not divide exactly, what does C do? Rounding toward 0 or truncation? Try different values of **`i`** and **`j`** to verify your conclusion.

Save the program you have developed for this part in a file named pa2p2.c. Create a header comment section that is similar to that of Part III of Programming Assignment No. 1. Insert your answer to Part I as a part of the header comment. Submit pa2p2.c through the course Blackboard.

Part III: Compound arithmetic operations in C

Compound assignments in C combine an arithmetic operation with an assignment. Read p.60 of the text about the five C arithmetic compound assignment operators: **`+=, -=, *=, /=`** and **`%=`**. Revise pa2p2.c so that you can compute the sum, difference, product, division and modulus - division remainder - of two integers (say, 78 and 56). Compile and run the code until the expected outputs are observed.

Revise the header comment section so that it is applicable to Part III only. Delete the answer to Part I. Name the file as pa2p3.c and submit through the Blackboard.

Marking

The programming assignment is worth a total of 2%, distributed as follows:

Part I: 1%
Part II: 1%
Part III: 1%

Assignment Submission

Submit **`pa2p2.c`** and **`pa2p3.c`** as two separate files through the Blackboard for this class and be prepared to demonstrate to a TA in the next lab session how you completed this assignment.

Notes:
1. Please work on the homework independently. The university has a zero-tolerance policy on plagiarism.
2. Our policy regarding AI assisted programming assignments will be announced later.