

CS 1313 010 Spring 2025 Homework #7

Quiz to be held in class 9:00-9:15am Mon March 3 2025

Please feel free to discuss these questions with your classmates, but **NOT** to copy each other.

NOTE: Except where and as explicitly permitted in writing (for example, in a Homework), you are **ABSOLUTELY FORBIDDEN** to **COPY EVEN A SINGLE CHARACTER** from,

or to have **ANY** shared code with, **ANY** other entity,
whether a human being (regardless of whether in CS1313 or not),
a text resource, a computing resource or anything else,
whether in person, on a local computer, online or anywhere else.

It's **INCREDIBLY EASY** for us to detect such copying, so **DON'T EVEN THINK ABOUT IT!**

1. **DRAW THE TRUTH TABLES** for the following Boolean operations:

(a) **AND**

(b) **OR**

(c) **NOT**

2. Write the C Boolean value — either **1**, meaning true, or **0**, meaning false — that results from computing each of the following C expressions. For parts (d) through (j), **SHOW ALL INTERMEDIATE STEPS**. If you aren't confident of your answer, write, compile and run a C program to test it.

(a) `! 0`

(b) `1 && 0`

(c) `0 || 1`

(d) `! 0 || 1`

(e) `! (0 || 1)`

(f) `! 1 && 1`

(g) `! (1 && 1)`

(h) `! 0 || 0`

(i) `! (0 || 0)`

(j) `! 1 || ! 1`

3. A C program has the following declarations:

```
float x = 29.0, y = 37.0, z = 49.0;
int   i = 29, j = 41, k = 49;
char  sky_is_blue   = 0;
char  chair_is_green = 1;
char  chair_is_brown = 0;
```

WRITE THE RESULT of evaluating each of the following expressions. **SHOW ALL INTERMEDIATE STEPS**, including the type of each subexpression (indicating a `float` with a decimal point). If you aren't confident about any of your answers, write, compile and run a C program to test it.

(a) `sky_is_blue || x <= z`

(b) `x < y && y < z`

(c) `k >= j || j >= y`

(d) `i != y`

(e) `k == z`

(f) `chair_is_green && (x + y + z) < 56`

(g) `chair_is_brown || x + y + k == 56`

4. Consider this program:

```
#include <stdio.h>

int main ()
{ /* main */
    const int constant1 = 10, constant2 = 20,
           constant3 = 14;
    int  input_value;
    char current_truth;

    printf("What is the input value?\n");
    scanf("%d", &input_value);
    current_truth = input_value > constant1;
    printf("current_truth = %d\n", current_truth);
    current_truth =
        current_truth && (input_value < constant2);
    printf("current_truth = %d\n", current_truth);
    current_truth =
        current_truth && (input_value == constant3);
    printf("current_truth = %d\n", current_truth);
} /* main */
```

WHAT IS THE OUTPUT of this program for the following inputs? If you aren't confident of your answer, type in, compile and run the program to test it.

(a) **9**

(b) **15**

(c) **17**

(d) **21**

5. **ADD A STATEMENT OR STATEMENTS** to the program on the following page (including constant and/or variable declarations if you want) so that the output is the single character

1

followed by a newline. Statements in the execution body of the program must **NOT** include any literal constants (numeric, Boolean or `char`); however, you may declare named constants and/or initialize variables in the declaration section of the program. In the program body, you must use at least **TWO** declared identifiers (variables or named constants), and you are **ABSOLUTELY FORBIDDEN** to use anything like the following statement:

```
printf("1\n");
```

On the other hand, you are encouraged to use a `printf` statement that outputs the result of a Boolean expression (which output will be either `1` or `0`).

If you aren't confident of your answer, type in, compile and run the resulting C program to test it.

⇒

```

#include <stdio.h>

int main ()
{ /* main */
    /*
    *****
    * Declaration Section
    *****
    *
    * Named Constants
    */
    const int bits_per_byte           = 8;
    const int attention_span_in_seconds = 3;
    /*
    * You can insert stuff after this comment.
    */

    /*
    * Local variables
    */
    int modem_send_speed_in_bits_per_second = 56000;
    int script_file_length_in_bytes        = 28000;
    int seconds_to_send_script_file;
    /*
    * You can insert stuff after this comment.
    */

    /*
    *****
    * Execution Section
    *****
    *
    * You can insert stuff after this comment.
    */

} /* main */

```

If you use ANY resources other than Dr. Neeman, the TAs/graders (Basiri, Bilal), the course text-book or the materials posted on the course webpage, you MUST reference them on the quiz. **THIS INCLUDES CLASSMATES, FRIENDS, PROFESSORS, ONLINE RESOURCES, ETC.**