

CYBR 437 Secure Coding

Winter 2026

Lab - 1

Release date: January 6, 2026

Due date: January 12, 2026, at 11:59 pm

Introduction

In this lab, you will modify/write a few C programs, execute them, and analyze the outputs. You may use your preferred compiler for this lab, including an online compiler such as https://www.onlinegdb.com/online_c_compiler.

1. (15 points) Examine the following program and perform the tasks given below it.

```
#include <stdio.h>

int main()
{
    char c = 'C';
    char *p = &c;

    printf("p is %p\n", p);
    printf("The value at p is %c\n", *p);

    /* Pointer arithmetic to find what p+1 is */
    p = p + 1;
    printf("Now p is %p\n", p);

    return 0;
}
```

- a) (3 points) Execute the program and explain the output.
- b) (3 points) Modify the code to perform the same pointer arithmetic on a pointer to an int. Execute the program and explain the output.
- c) (3 points) Modify the code again to perform the same pointer arithmetic on a pointer to a double. Execute the program and explain the output.
- d) (6 points) What should happen if the line `p = p + 1` is changed to `p = p + 2` in parts a-c above? Execute the program with this change (for all of parts a-c) to verify your answer.

2. (5 points) In the following program, add required lines of code to print the value and address of variable `x` in `fun1`, and variable `y` in `fun2`. Execute the program and precisely explain the output.

```
#include <stdio.h>

void fun1(int xval)
{
    int x;
    x = xval;
    /* print the address and value of x here */

}

void fun2()
{
    int y = 10;
    /* print the address and value of y here */

}

int main()
{
    fun1(5);
    fun2();
    return 0;
}
```

3. (5 points) Write a program that declares and initializes (to any value) a double and an int. Your program should then print the address and the value stored in each of the variables, along with the amount of memory each variable occupies.
4. (5 points) Write a function that accepts two double variables as parameters (by value) and swaps their values. Then call the function in the main function to verify that your function works correctly.

Submission Instructions: Please submit a single PDF file in Canvas that includes:

1. C code and/or explanations for all the tasks in text format (please do not include the code as screenshots).
2. Screenshots showing the successful execution and output of each program.