**CS 7311**

**Assignment 1: Modules 1 & 2 (25 points total)**

**NAME:**

The following questions are based on the activity downloaded from Canvas, described in **7311.Assignment1.Activity.pdf.**

Follow the instructions and answer the following questions.

**Part A. (2 pts each)**

1. What is the size of this program in bytes? \_\_\_\_\_\_\_\_\_\_\_\_\_

2. True or False: The program code, stack and memory all share the computer's RAM? \_\_\_\_\_\_\_\_\_\_\_\_

3. How many memory accesses (data or instructions moving across the bus) occur during the execution of the demo program? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Part B. Enter the following C code into the code window, compile to assembler at ctoassembly.com and answer the following questions (2 pts each)**

int z = 99;

int main() {

int x = 1;

z = x + z;

return 0;

}

**Compile and execute and answer the following questions.**

4. At what memory address is the global variable **z** stored? \_\_\_\_\_\_\_\_\_\_\_\_

5. When executing the ADD instruction, that adds 1 to the value of the global variable z, at what memory address is the value 1 located? \_\_\_\_\_\_\_\_\_\_\_

6. When the ADD instruction adds 1 to the value of the global variable z, what memory address is the result of the ADD stored. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. What assembly language statement actually updates the value of z? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. When the program terminates, the last statement is **return 0;**   
At what memory location is this value of 0 stored so it can be retrieved by operating system running the code? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Part C.

9. (4 pts) Assume you have 1000 bytes of cache memory such that the entire program will fit into cache memory. Will this have an effect on the running time of the program? Answer yes or no and explain why.

10. (5 pts) With respect to cache memory, explain the difference between the principle of **temporal localit**y vs. the principle of **spatial locality**.