**Name:**

**Advanced Programming in C++**

**Lab Exercise 5/5/2021**

**A Practice Exercise With MARIE**

**Machine Architecture that is Really Intuitive and Easy (MARIE)**

1. Copy the entire folder named Marie from the \\Ada\data files\C++\ to your desktop.
2. Open the folder and double-click on MarieSim.jar (an executable Java Archive)
3. From the File Menu Select Edit to open up the Marie Assembler Code Editor
4. Type in the following program into the editor:

ORG 100

Load Addr

Store Next

Load Num

Subt One

Store Ctr

Clear

Loop, Load Sum

AddI Next

Store Sum

Load Next

Add One

Store Next

Load Ctr

Subt One

Store Ctr

Skipcond 800

Jump Loop

Halt

Addr, Hex 118

Next, Hex 0

Num, Dec 5

Sum, Dec 0

Ctr, Hex 0

One, Dec 1

Dec 10

Dec 15

Dec 20

Dec 25

Dec 30

1. Assemble the code by selecting Assemble/Assemble Current File from the Editor menu (Note you must Save your file first before you can Assemble).
2. Select Assemble/Show Assembly Listing and view what the assembler created. You should see an assembly listing that shows what is loaded into memory.
3. Record the range of memory that is used for this program. \_\_\_\_\_\_\_\_
4. Now load your assembled program into the MARIE simulator.
5. Step through your program until it is completed. If you are in a hurry, just Run the program.
6. Record the contents of the Accumulator, Instruction Register, Memory Address Register, Memory Buffer Register, and Program Counter:

AC \_\_\_\_\_\_\_

IR \_\_\_\_\_\_\_

MAR \_\_\_\_\_\_\_

MBR \_\_\_\_\_\_\_

PC \_\_\_\_\_\_\_

Now try look at some other programs. In the Marie folder, there are three example programs. You should open these in the MARIE Assembler Code Editor, examine them, assemble them and run them in MARIE.

Challenge:

1. Write a program that adds the numbers from 1 to 10.
2. Write a program that will allow the user to enter two numbers and displays the product of those two numbers.



