**Program 2- B17**

**Submitted by Marcus Berger, Kevin Hilt, and Evan Hammer**

**Program Description:**

**Libraries used:**

Libraries used in this program are :  
 <iostream>, <iomanip>, <string>, <sstream>,<fstream>, and <cstdlib>

**Algorithm:**

1. Read in the object file and set up the memory array
2. Read in instruction counter and the number of instruction to be executed
3. For each instruction begin to execute instruction
   1. Decode the instruction and determine the address mode and instruction to be executed.
   2. Execute the correct instruction
4. Check the address mode to get the correct output
5. Output the information for executed instruction
6. Repeat steps 3-5 for each instruction
7. If an error is encountered

**Functions and Program Structure:**

**Compiling and Usage:**

Compile by typing “make b17” in Linux

Usage: b17 “object file name”

Sample object file:

50 1 000000  
c4 5 050404 200800 300800 102840 050c00  
101 2 300 9   
200 1 30   
300 1 10   
c4

Output file will contain memory address, instructions, the instruction executed, the address mode, that contains of the accumulator and the contains of registers x0-x3 for each instruction executed. When a halt instruction or halt error is encountered a correct message is printed and the program terminates.

Sample output file:  
0c4: 050404 LD IMM AC[000050] X0[000] X1[000] X2[000] X3[000]   
0c5: 200800 ADD 200 AC[000080] X0[000] X1[000] X2[000] X3[000]  
0c6: 300800 ADD 300 AC[000090] X0[000] X1[000] X2[000] X3[000]  
0c7: 102840 SUB 102 AC[000087] X0[000] X1[000] X2[000] X3[000]  
0c8: 050c00 J 050 AC[000087] X0[000] X1[000] X2[000] X3[000]   
050: 000000 HALT AC[000087] X0[000] X1[000] X2[000] X3[000]  
Machine Halted - HALT instruction executed

**Testing:**

**What was submitted?**

b17.cpp – contains the main function for the b17 program

b17\_functions.cpp – contains the get\_instruction, get\_addressmode, hex\_to\_int, read\_memoy, and match\_instruction functions to prevent needing to repeat code,

b17.h – header file containing libraries used and function prototypes for the b17 program

makefile – complies the b17 program by typing “make b17”