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ENEE 350 Homework Set 7

Programming Project 2

(Due: Class 19, Wed., July 2, 2008)

Write, assemble and run successfully on the simulator a Mac-1 subroutine **lgneg(n,x)** that returns in the AC the address of the integer possessing the algebraically largest negative value along the real line among the n integers in the array whose starting address is x. The largest negative value on the real line is the farthest right value to the left of zero. If there are no negative values among the n elements to be processed, then return -1 which is equivalent to the address 65535, clearly not a valid memory address. If there are two are more array entries that equally satisfy the requirements, return the address of the one with the highest address. Your subroutine should be tested with the main program shown below, which defines how the parameters are passed.

```
     /main program
         EXTRN lgneg
ans1     RES    1
ans2     RES    1
ans3     RES    1
n1        6
n2        10
n3        5
start   loco   4020
        swap           /initialize sp
        loco    n1
        push           /push address  n1
        loco    data
        push           /push array start address
one     call    lgneg
        stod    ans1
        insp     2
        loco    n2     /push address  n2
        push
        loco    data
        addd    (4)
        push           /push array start address
two     call    lgneg
        stod    ans2
        insp     2
        loco    n3     /push address  n3
        push
        loco    data
        addd    (9)
        push           /push array start address
three   call    lgneg
        stod    ans3
        insp    2
        halt
  /data array continues here but
  /  is shown in the above right hand column
```

```
  /continued from below halt
data     57
          0
        129
         34
          8
          3
        -29
        -15
         -2
       -347
         -3
          6
         35
       -413
         END     start
```

Hand in a copy of the main program symbolic assembly listing, the subroutine symbolic assembly listing, the contents of (macro) memory after “load main sub” (i.e., of main.abs) before execution of the program, and the contents of memory after execution of the program. Highlight and comment upon the final answers. Specify what values are contained in the addresses specified by ans1, ans2, and ans3.