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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 or 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                                     | /continued from below halt
      EXTRN lgneg                                  | data      57
ans1  RES    1                                     |           0
ans2  RES    1                                     |          129
ans3  RES    1                                     |           34
n1     6                                           |           8
n2    10                                           |           3
n3     5                                           |          -29
start  loco  4020                                  |          -15
      swap                                /initialize sp |           -2
      loco  n1                               |         -347
      push                                /push address n1 |           -3
      loco  data                             |            6
      push                                /push array start address |           35
one    call  lgneg                             |          -413
      stod  ans1                               |           END      start
      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       |

```

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.