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ENEE 350 Homework Set 7

Programming Assignment 2

(Due: Class 17, Mon., June 30, 2014)

Write, assemble and run successfully on the simulator a Mac-1 subroutine **min(n,x)** that returns in the AC the address of the integer possessing the algebraically smallest value among the n integers in the array whose starting address is x. Your subroutine should be tested with the main program shown below, which defines how the parameters are passed. If there is more than one such minimum value, then return the highest address among the set of them.

```
     /main program                                    |     /continued from below halt
         EXTRN min                                    |   data     57
ans1     RES    1                                     |            0
ans2     RES    1                                     |          129
ans3     RES    1                                     |          -34
n1        9                                           |            8
n2        10                                          |            3
n3        5                                           |          -29
start   loco   4020                                   |           -2
        swap            /initialize sp                |           -3
        loco    n1                                    |          347
        push            /push address  n1             |          -15
        loco    data                                  |            6
        push            /push array start address     |           35
one     call    min                                   |         -413
        stod    ans1                                  |           END     start
        insp     2                                    |
        loco    n2      /push address  n2             |
        push                                          |
        loco    data                                  |
        addd    (4)                                   |
        push            /push array start address     |
two     call    min                                   |
        stod    ans2                                  |
        insp     2                                    |
        loco    n3      /push address  n3             |
        push                                          |
        loco    data                                  |
        addd    (7)                                   |
        push            /push array start address     |
three   call    min                                   |
        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.