Microprocessors Problem Set #3

Revision: February 4, 2026

1. (20 points) Write a “findlargest” assembly subroutine (at label sub1) to find the largest number in a list of numbers stored in consecutive memory locations. The length of the list is stored at location 0x00100000, and the address of the first data element is stored at location 0x00100004. The largest value in the list should be returned in R2. Your subroutine should preserve and restore context properly. You are given the following instructions in the main program.

```
.text
.global main
.equ length, 0x00100000         // 0x00100000 stores list length
.equ listadd, 0x00100004        // 0x00100004
.equ largest, 0x00100008        // 0x00100008 stores address of first element


main:   ldr   r4,=length
        ldr   r5,=listadd
        ldr   r6,=largest
        ldr   r0,[r4]           // r0 holds length
        ldr   r1,[r5]           // r1 holds address of first data
        bl    sub1
        str   r2,[r6]

        // other instructions not a part of this problem

 term:  b term
```