CS/COE 0447 Fall 2009
Lab 8: Floating Point Instructions
Due Date: November 5, 2009

To get started on this lab, attend recitation on 10/30. Each of you should submit your own solution, according to these instructions: http://www.cs.pitt.edu/~sab104/teaching/cs447/submission.html. You may collaborate with your partner, but each person must turn in their own copy of the lab, with the name of their partner. The lab is due on 11/5 at 11:59pm.

1) Arithmetic on floating point numbers

Write a MIPS program that prompts the user for 3 single precision floating point numbers (X, Y and Z) and calculates the value of the expression X^2 + (2*X*Y – 3*Y) / Z. Your program should print the result to standard output. Use syscalls 2 and 6 to print and read floating point numbers.

2) Loading and storing floating point numbers

Consider the following data definition:

```
        .data
size:   .word 5
a1:     .float 1.3 2.5 6.9 4.4 3.8
a2:     .space 20
```

Label *a1* is an array of 5 single precision floating point numbers and *a2* is an array of 5 words, which we will use to store other floating point numbers. Label *size* holds the size of the arrays.

Write a MIPS program that fills up array *a2* with the cumulative sum of the elements of array *a1* and then prints the contents of both arrays. Your program should work with different array sizes.

Example:
Array a1 = [1.3, 2.5, 6.9, 4.4, 3.8]
Array a2 = [1.3, 3.8, 10.7, 15.1, 18.9]

3) Comparing floating point numbers

The following data directive defines an array of single precision floating point numbers and its size:

```
        .data
size:   .word 6
a1:     .float 3.3 5.5 9.8 10.1 1.3 2.3
```

Write a MIPS program that finds the minimum and maximum values of the array (1.3 and 10.1 in the case above) and prints them to standard output. Your program should work with different array sizes.