## CS 3340 Computer Architecture

## Homework 1: MIPS Programming Basics

Objective: Get started with MIPS programming in a MARS environment. Practice load/store instructions, add and sub instructions, as well as MIPS syscalls.

### Instructions

Create a MIPS program that fulfills the following specifications:

* in the .data section:
  + 3 variables to hold input values: a, b, c
  + 3 variables to hold output values (name them whatever you like)
  + a variable to hold the user’s name
  + 3 variables for messages:
    - A prompt for name
    - A prompt for integers
    - A message for results (similar to the sample run below)
* in the .text section write instructions to:
  + prompt the user for their name and save it in memory
  + 3 times:
    - prompt user for an integer between 1-100
    - read and store the integers in a, b, and c
    - no input checking required
  + calculate ans1 = 2a - c + 4 (use a+a for 2a) and store the result
  + calculate ans2 = b - c + (a - 2) and store the result
  + calculate ans3 = (a + 3) - (b - 1) + (c + 3) and store the result
  + display the user’s name and message for results
  + display the 3 results but print a space character in between for readability
* at the bottom of your program, add **comments** with test values for a, b, c and the results you expect from the program for ans1, ans2, ans3 (see sample run below). Show at least 2 sample runs.

What to turn in:

* after you test your program, upload the .asm file to eLearning

Grading Rubric:

|  |  |
| --- | --- |
| **Points** | **Element** |
| 10 | Data section set up; data values and results stored |
| 5 | Get name from user |
| 15 | Get 3 integers from user |
| 30 | Calculate 3 expressions |
| 10 | Display user’s name, message and results |
| 10 | Display space between results |
| 10 | Program test-data comments |
| 10 | Program contains meaningful comments and good use of whitespace |

Sample Run: (you should use different and more interesting test data)

What is your name? Karen

Please enter an integer between 1-100: 10

Please enter an integer between 1-100: 20

Please enter an integer between 1-100: 30

Karen

your answers are: -6 -2 27

-- program is finished running --

Note:

* Notice that printing the name string causes a newline, but don’t worry about it
* Note also that you will need to print space ‘ ‘ between numbers so that they don’t run together
* If the user types anything other than an integer, you will get an exception. We haven’t learned how to deal with that, so assume that your user can follow instructions.