The University of Alabama in Huntsville
Electrical and Computer Engineering Department
CPE 221 01
Fall 2012
Test 2 Extra Credit Solution

The maximum points, y, is tied to the score you made on Test 2, x, as follows:

$y = (100 – x)/4$

Complete the SRC assembly language program below so that it implements the following C++ statements.

```
   int x[10] = {5, 3, -1, 2, 4, 37, -100, 13, -5, 0};
   int y[10];
   int a = 5;
   int size = 10;
   for (i = 1; i < size; i++)
      y[i] = x[i] + a;
```

```
;
;     This program adds a scalar value to all the elements in one
;      array and stores that in another array.

            .org  200
size:       .equ  10
a:          .dc   5
x:          .dc   5, 3, -1, 2, 4, 37, -100, 13, -5, 0
y:          .dw   size

orig:       .org  1000
            lar   r30, done
            lar   r29, loop

            lar   r10, x                ; pointer to first element of x
            lar   r11, y                ; pointer to first element of y
            la    r1, size          ; holds size of arrays
            ld    r4, 0             ; i = 0
            ld    r2, a             ; load a into r2

loop:       sub   r5, r4, r1        ; Check to see whether index < size.
            brpl  r30, r5           ; If not, done.
            shl   r6, r4, 2         ; Multiply index by 4 to access entry
                                    ; in array by byte address.
            add   r3, r6, r10       ; Add index to base pointer of x.
            add   r8, r6, r11       ; Add index to base pointer of y.
            ld    r7, 0(r3)         ; Load array[i] into r7.
            add   r7, r7, r2        ; Add a to x[i]
            st    r7, 0(r8)         ; Store result in y.
            addi  r4, r4, 1         ; i++
            br    r29
done:       stop
```