

## CS352 – Assignment #1

### Sept. 3, 2008

**Weight:** 25 points

**Due date:** Monday, Sept. 8, 2008 (beginning of class)

1. For each of the following sequence of C statements, give a sequence of MIPS assembly language statements which accomplish the same result. In each of these, assume that the address of *aa* is in  $\$1$ , the address of *bb* is in  $\$s2$  and the address of *cc* is in  $\$s3$ . Also, assume that these do not change during the execution of each sequence:
  - a. `if(aa == bb) cc = 1; else cc = 2;`
  - b. `aa = 1; bb = 100; cc = aa + bb;`
  - c. `bb = 0; for(aa = 1; aa < 3; aa++) bb = bb + aa;`
  - d. `if(aa < bb) cc = 1; else cc = 2;`
  - e. `aa = 4*bb;`
  
2. Give a sequence of MIPS assembly language instructions that produces the same results as the following sequence of C statements:
 

```
i = 0;
sum = 0;
while(i < 8) {
    sum = sum + x[i];
    i = i + 1;
}
```

Assume that the address of *i* is in  $\$s1$ , the address of *sum* is in  $\$s2$  and the address of *x* (really *x[0]*) is in  $\$s3$ .
  
3. Give a sequence of C statements that produces the same results as the following sequence of MIPS assemble language statements (assume  $\$s1$  = address of *i*,  $\$s2$  = address of *j*, *x* is an array of int and  $\$s3$  = address of *x[0]*)
 

```
lw $t0, 0($s1)
lw $t1, 0($s2)
slt $t5, $t0, $t1
beq $t5, $zero, exit
add $t6, $t0, 4
add $t4, $s3, $t6
sw $zero, 0($t4)
exit
:
```
  
4. Give three different MIPS assembly language statements that will leave the value 0 in register  $\$s1$ .

(see next page)

5. Give the hexadecimal representation of the following MIPS assembly language statements:
  - a. `add $t0, $t2, $t4`
  - b. `addi $s0, $s2, 4`
6. Give the MIPS representation of the following hexadecimal representations of MIPS machine language
  - a. `0x34080001`
  - b. `0x01095020`