CS 506

HOMEWORK ASSIGNMENT 4

Chapter 2 (Morgan Kauffman book)

**1.** For the following C statement, what is the corresponding MIPS

assembly code? Assume that the variables f, g, h, and i are given and could be

considered 32-bit integers as declared in a C program. Use a minimal number of

MIPS assembly instructions.

f = g + (h − 5);

ANSWER:

GIVEN: f = g + (h − 5);

NOW let i= h-5 then

F=g+i

Therefore the corresponding MIPS assembly code is

**add i, h, -5**

**add f ,g, i**

**2.** For the following MIPS assembly instructions above, what is a

corresponding C statement?

add f, g, h

add f, i, f

ANSWER: **f=g+h;**

**f=i+f;**

**f= i + (g+h);**

**3.** For the following C statement, what is the corresponding

MIPS assembly code? Assume that the variables f, g, h, i, and j are assigned to

registers $s0, $s1, $s2, $s3, and $s4, respectively. Assume that the base address

of the arrays A and B are in registers $s6 and $s7, respectively.

B[8] = A[i−j];

ANSWER: sub $t0, $s3, $s4

add $t0, $s6, $t0

lw $t1, 16($t0)

sw $t1, 32($s7)

**4.** Translate 0xabcdef12 into decimal. (Show the work and apply any method you like)

ANSWER: Using Hex to dec method

abcdef12=

(10\*167)+ (11\*166)+(12\*165)+(13\*164)+(14\*163)+(15\*162)+(1\*161)+ (2\*160)

=**2882400018**

**5.** Translate the following C code to MIPS. Assume that the

variables f, g, h, i, and j are assigned to registers $s0, $s1, $s2, $s3, and $s4,

respectively. Assume that the base address of the arrays A and B are in registers $s6

and $s7, respectively. Assume that the elements of the arrays A and B are 4-byte

words:

B[8] = A[i] + A[j];

ANSWER: **sll $t0, $s3, 2**

**add $t0, $t0, $s6**

**lw $t0, 0($t0)**

**sll $t1, $s4, 2**

**add $t1, $t1, $s6**

**lw $t1, 0($t1)**

**add $t1, $t0, $t1**

**addi $t0, $s7, 32**

**sw $t1, 0($t0)**

**# $t0 <-- 4\*i**

**# $t0 <-- Addr(A[i])**

**# $t0 <-- A[i]**

**# $t1 <-- 4\*j**

**# $t1 <-- Addr(A[j])**

**# $t1 <-- A[i]**

**# $t1 <-- A[i] + A[j]**

**# $t0 <-- Addr(B[8])**

**# B[8]<-- $t1**