EGC-442 HW# 2 Dr. Izadi

First Name:_____ Last Name: _____

Problem 1 (10 Pt)
For the following C statement, what is the corresponding MIPS assembly code? Assume that the C variables f, g, and h, have already been placed in registers $s0, $s1, $s2, respectively. Use a minimal number of MIPS assembly instructions.

f = g + (h − 5);

Problem 2 (10 Pt)
Write a single C statement that corresponds to the two MIPS assembly instructions below.

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add  f, g, h
add  f, i, f
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Problem 3 (10 Pt)
For the following C statement, write 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];

Problem 4 (10 Pt)
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 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];

Problem 5 (10 Pt)
For each MIPS instruction in Exercise 2.8, show the value of the opcode (op), source register (rs) and funct field, and destination register (rd) fields. For the I-type instructions, show the value of the immediate field, and for the R-type instructions, show the value of the second source register (rt).

	type	opcode	rs	rt	rd	immed
addi $t0, $s6, 4						
add $t1, $s6, $0						
sw $t1, 0($t0)						
lw $t0, 0($t0))						
add $s0, $t1, $t0						

Problem 6 (10 Pt)
Assume that registers $s0 and $s1 hold the values 0x80000000 and 0xD0000000, respectively.

(a) What is the value of $t0 for the following assembly code?

add $t0, $s0, $s1

(b) Is the result in $t0 the desired result, or has there been overflow?

(c) For the contents of registers $s0 and $s1 as specified above, what is the value of $t0 for the following assembly code?

sub $t0, $s0, $s1

(d) Is the result in $t0 the desired result, or has there been overflow?

(e) For the contents of registers $s0 and $s1 as specified above, what is the value of $t0 for the following assembly code?

add $t0, $s0, $s1
add $t0, $t0, $s0

(f) Is the result in $t0 the desired result, or has there been overflow?

Due: 2/24/2023