CS202 Computer Organization HW#1

Problem 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.

$$f = g + (h - 5);$$

Problem 2.

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.

$$B[8] = A[i - j];$$

Problem 3.

The table below shows 32-bit values of an array stored in memory.

Address	Data
24	2
28	4
32	3
36	6
40	1

1) For the memory locations in the table above, write C code to sort the data from lowest to highest, placing the lowest value in the smallest memory location shown in the figure. Assume that the data shown represents the C variable called *Array*, which is an array of type int, and that the first number in the array shown is the first element in the array. Assume that this particular machine is a byte-addressable machine and a word consists of four bytes.

2) For the memory locations in the table above, write MIPS code to sort the data from lowest to highest, placing the lowest value in the smallest memory location. Use a minimum number of MIPS instructions. Assume the base address of *Array* is stored in register $s6.

Problem 4.

Provide the type, assembly language instruction, and binary representation of instruction described by the following MIPS fields (all the numbers are in deximal):

op=0, rs=3, rt=2, rd=3, shamt=0, funct=34