2.3 [5] <§§2.2, 2.3> 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];
```

2.4 [5] <§§2.2, 2.3> For the MIPS assembly instructions below, what is the corresponding C statement? 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.

```
sll  $t0, $s0, 2     # $t0 = f * 4
add  $t0, $s6, $t0   # $t0 = &A[f]
sll  $t1, $s1, 2     # $t1 = g * 4
add  $t1, $s7, $t1   # $t1 = &B[g]
lw   $s0, 0($t0)     # f = A[f]
addi $t2, $t0, 4
lw   $t0, 0($t2)
add  $t0, $t0, $s0
sw   $t0, 0($t1)
```

2.7 [5] <§2.3> Show how the value `0xabcdef12` would be arranged in memory of a little-endian and a big-endian machine. Assume the data is stored starting at address 0.

2.12 Assume that registers `$s0` and `$s1` hold the values `0x80000000` and `0xD0000000`, respectively.

2.12.1 [5] <§2.4> What is the value of `$t0` for the following assembly code?

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

2.12.2 [5] <§2.4> Is the result in `$t0` the desired result, or has there been overflow?

2.12.3 [5] <§2.4> 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
```

2.12.4 [5] <§2.4> Is the result in `$t0` the desired result, or has there been overflow?

2.12.5 [5] <§2.4> 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
```

2.12.6 [5] <§2.4> Is the result in `$t0` the desired result, or has there been overflow?

2.19 Assume the following register contents:

```
$t0 = 0xAAAAAAAA, $t1 = 0x12345678
```

2.19.1 [5] <§2.6> For the register values shown above, what is the value of `$t2` for the following sequence of instructions?

```
sll $t2, $t0, 4
or  $t2, $t2, $t1
```

2.19.2 [5] <§2.6> For the register values shown above, what is the value of `$t2` for the following sequence of instructions?

```
sll  $t2, $t0, 4
andi $t2, $t2, -1
```

2.19.3 [5] <§2.6> For the register values shown above, what is the value of `$t2` for the following sequence of instructions?

```
srl  $t2, $t0, 3
andi $t2, $t2, 0xFFEF
```

2.20 [5] <§2.6> Find the shortest sequence of MIPS instructions that extracts bits 16 down to 11 from register `$t0` and uses the value of this field to replace bits 31 down to 26 in register `$t1` without changing the other 26 bits of register `$t1`.

2.27 [5] <§2.7> Translate the following C code to MIPS assembly code. Use a minimum number of instructions. Assume that the values of `a`, `b`, `i`, and `j` are in registers `$s0`, `$s1`, `$t0`, and `$t1`, respectively. Also, assume that register `$s2` holds the base address of the array D.

```
for(i=0; i<a; i++)
   for(j=0; j<b; j++)
      D[4*j] = i + j;
```

2.39 [5] <§2.10> Write the MIPS assembly code that creates the 32-bit constant $0010\ 0000\ 0000\ 0001\ 0100\ 1001\ 0010\ 0100_{two}$ and stores that value to register `$t1`.