Assignment2

2.10

Translate the following MIPS code to C. 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.

```
addi $t0, $s6, 4
add $t1, $s6, $0
sw $t1, 0($t0)
lw $t0, 0($t0)
add $s0, $t1, $t0
```

```
f = 2 * (&A);
```

2.12

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

2.12.1

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

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

---

t0 = 0x50000000

2.12.2

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

Overflow

2.12.3

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

```
1  sub $t0, $s0, $s1
```

---

t0 = 0xB0000000

2.12.4

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

Desired result

2.12.5

For the contents of registers $s0 and $s1 as specif ed above, what is the value of $t0 for the following assembly code?

```
1  add $t0, $s0, $s1
2  add $t0, $t0, $s0
```

---

t0 = D0000000

2.12.6

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

Overflow

2.14

Provide the type and assembly language instruction for the following binary value:
$0000\ 0010\ 0001\ 0000\ 1000\ 0000\ 0010\ 0000_{two}$

R-type

```
1  add $s0, $s0, $s0
```

2.16

Provide the type, assembly language instruction, and binary representation of instruction described by the following MIPS fields:

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

R-type

```
1  sub $v1, $v1, $v0, 0x00621822
```

2.19

Assume the following register contents:

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

2.19.1

For the register values shown above, what is the value of $t2 for the following sequence of instructions?

```
1  sll $t2, $t0, 44
2  or $t2, $t2, $t1
```

---

t2 = 0xBABEFEF8

2.19.2

For the register values shown above, what is the value of $t2 for the following sequence of instructions?

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

---

t2 = 0xAAAAAAA0

2.19.3

For the register values shown above, what is the value of $t2 for the following sequence of instructions?

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

---

t2 = 0x00005545

2.23

Assume $t0 holds the value 0x00101000. What is the value of $t2 af er the following instructions?

```
1      slt $t2, $0, $t0
2      bne $t2, $0, ELSE
3      j DONE
4  ELSE: addi $t2, $t2, 2
5  DONE:
```

---

t2 = 3