

## ECE 15B Homework 4 solutions

1. Conversion from decimal to IEEE floating point (in Hex form)

- a. 1536  
0x 44C00000
- b. 0.015625  
0 x 3C800000
- c. 245.125  
0 x 43752000

2. Convert hex to MIPS instructions

- a. 0x3C019000  
lui \$at, 0x9000
- b. 0x10040004  
beq \$a0, \$0, 0x0004
- c. 0x8C240180  
lw \$a0, 0x180(\$at)
- d. 0x0C000000  
jal 0x0

3. Convert MIPS to hexadecimal

- a. ori \$2, \$0, 10  
0x3402000A
- b. sw \$s3, 284(\$t0)  
0xAD13011C
- c. j 0x12345678  
0x88D159E
- d. srl \$at, \$sp, 9  
0x001D0A42

#### 4. Convert C to MIPS

swap:

```
# $a0 → px and $a1 → py
lw $t0, 0($a0) # t0 = *px
lw $t1, 0($a1) # t1 = *py
sw $t1, 0($a0)
sw $t0, 0($a1)

jr $ra
```

#### 5. Convert C to MIPS

strlen:

```
# $a0 → char *s
addi $t0, $a0, 0 # char *p = s
```

```
begloop: lb $t1, 0($t0)
         beq $t1, $zero, endloop
         addi $t0, $t0, 1 # p++
         j begloop
```

endloop:

```
sub $v0, $t0, $a0
jr $ra
```

#### 6. Calculate number of bytes for the data structures

- a. 8
- b. 16
- c. 12
- d. 8

#### 7. Print Link List

The data structure looks similar to the figure given, with 4 elements in the list

```
string1: ECE
string2: 15B
string3: COMPUTER
string4: ORGANIZATION
```