DEPARTMENT OF COMPUTER SCIENCE

COLORADO SCHOOL OF MINES
EARTH • ENERGY • ENVIRONMENT

CSCI 341: Computer Organization
WS 8: Instruction Formats

1	Why are all the instruction formats somewhat similar?
2	What are the basic instruction types? Draw out pictures showing their formats
3	Convert the following instruction to binary and hex. `lw t0, 32(s3)`
4	What range of values can be stored in the I-type immediate value?
5	What is the range for branch type instructions?

6 Convert the following instruction to binary and hex: `sw t0, 90(s0)`

7 Given the binary format of an instruction as follows

```
0000 0011 0000 1000 1000 1000 0110 0011
```

1. What assembly instruction does this correspond to?
2. If the PC = 0X0040 00F4, what is the target address?
3. How many instructions forwards or backwards is that?
4. How many bytes is that in decimal?

8 This is part of strncpy. What is/are the addressing mode(s) of each instruction?

```
add s0, zero, a1 # q = d;
add s1, zero, a0 # p = c;

# calculate &c[n]
add t1, a0, a2

for_loop:

   lb t0, 0(s1) # t0 = *p
   sb t0, 0(s0) # *q = t0
   addi s0, s0, 1 # q++
   addi s1, s1, 1 # p++

   # if (p <&c[n]) goto for_loop;
   blt s1, t1, for_loop
```