### MIPS cheat sheet

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<th>Syntax</th>
<th>Example</th>
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<tr>
<td>add</td>
<td>add dest, src0, src1</td>
<td>add $s0, $s1, $s2</td>
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<tr>
<td>sub</td>
<td>sub dest, src0, src1</td>
<td>sub $s0, $s1, $s2</td>
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<tr>
<td>addi</td>
<td>addi dest, src0, immediate</td>
<td>addi $s0, $s1, 12</td>
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<tr>
<td>lw</td>
<td>lw dest, offset(base addr)</td>
<td>lw $t0, 4($s0)</td>
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<tr>
<td>sw</td>
<td>sw src, offset(base addr)</td>
<td>sw $t0, 4($s0)</td>
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<td>bne</td>
<td>bne src0, src1, branchAddr</td>
<td>bne $t0, $t1, notEq</td>
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<td>beq</td>
<td>beq src0, src1, branchAddr</td>
<td>beq $t0, $t1, Eq</td>
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<td>j</td>
<td>j jumpAddr</td>
<td>j jumpWhenDone</td>
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### C vs MIPS

**C**

```c
// $s0 -> a, $s1 -> b
// $s2 -> c, $s3 -> z
int a=4, b=5, c=6, z;
z = a+b+c+10;
```

**MIPS**

```mips
addi $s0, $0, 0
addi $s1, $0, 1
add $t0, $0, 30
loop: beq $s0, $t0, done
add $s1, $s1, $s1
addi $s0, $s0, 1
j loop
done: # done!
```

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**C**

```c
// $s0 -> a, $s0 -> b
int a = 5, b = 10;
if (a + a == b) {
    a = 0;
} else {
    b = a - 1;
}
```

**MIPS**

```mips
addi $s0, $0, 0
add $s1, $0, 0
addi $t0, $0, 30
loop: beq $s0, $t0, done
add $s1, $s1, $s1
addi $s0, $s0, 1
j loop
done: # done!
```

---

**C**

```c
/*What does this do?*/
(Not C, in English) */
```

**MIPS**

```mips
addi $s0, $0, 0
add $s1, $0, 0
add $t0, $0, 30
loop: beq $s0, $t0, done
add $s1, $s1, $s1
addi $s0, $s0, 1
j loop
done: # done!
```

---

**C**

```c
// Strcpy:
// $s1 -> char s1[] = "Hello!";
// $s2 -> char *s2 = malloc(sizeof(char)*7);
int i=0;
doi{
    s2[i] = s1[i];
i++;
} while(s1[i]!="\0")
```

**MIPS**

```mips
addi $s0, $0, 0
add $s1, $0, 0
add $t0, $0, 30
loop: beq $s0, $t0, done
add $s1, $s1, $s1
addi $s0, $s0, 1
j loop
done: # done!
```
Bonus: There’s a building with 100 floors. You have 2 eggs. Assume that the eggs are of the same attributes. At the worst, how many times do you have to drop an egg off the building (count drops of both eggs) in order to determine the lowest floor at which the eggs will break? (Hint: it’s not 19)