

# EECS 370 Discussion

## Programming Languages as cars

### **C**

A racing car that goes incredibly fast but breaks down every fifty miles.

### **C++**

A souped-up version of the C racing car with dozens of extra features that only breaks down every 250 miles, but when it does, nobody can figure out what went wrong.

### **Assembly**

You are the car.

# EECS 370 Discussion

Undergrad at Michigan Tech  
Houghton, MI



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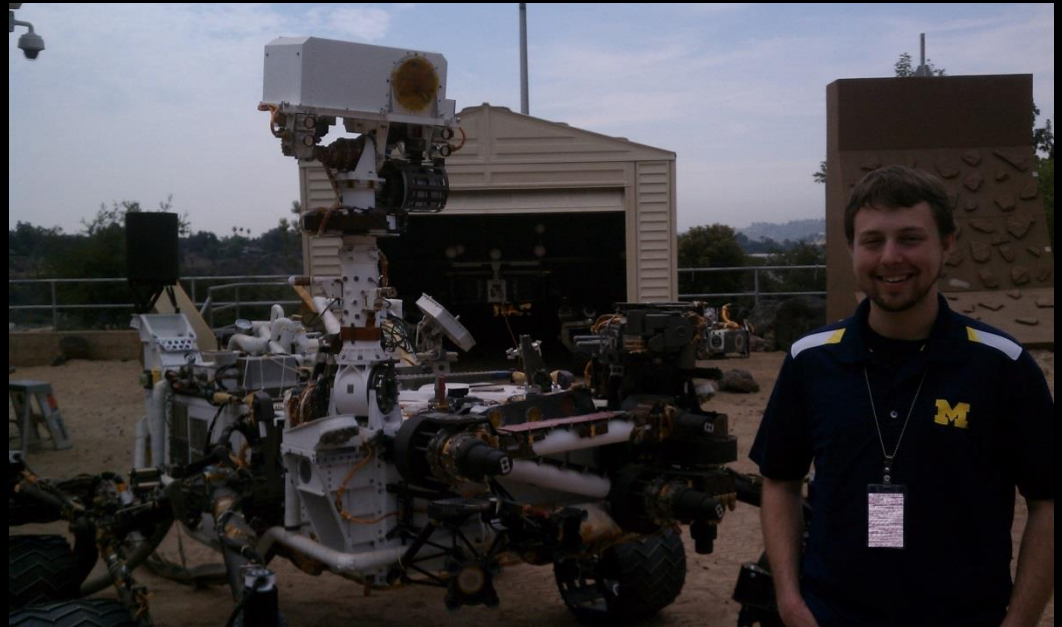
Excited By:

Embedded Systems

Space Stuff

Mandolin

Sci-Fi / Fantasy



Come say hello during Office Hours

# EECS 370 Discussion

## Two's Complement Numbers

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## Two's Complement Numbers

Example:

-37 in 8-bit two's complement binary

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Answer:  $11011011_2$

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## Two's Complement Numbers

Example:

-37 in 8-bit two's complement binary

Answer:  $11011011_2$

Question:

$-37 \Rightarrow 11011011_2$

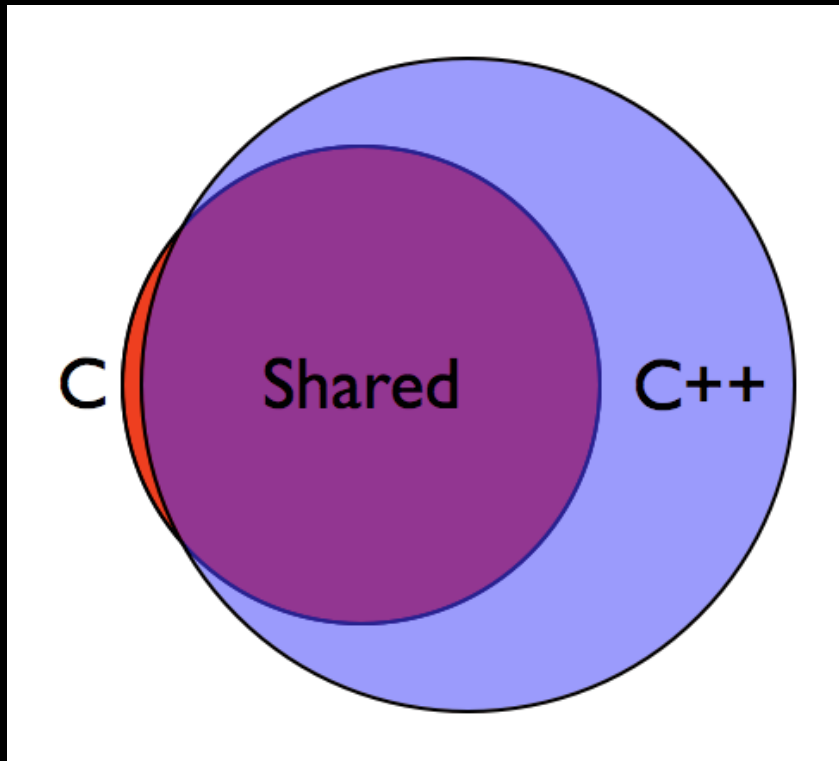
$219 \Rightarrow 11011011_2$

How do you know the difference?



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## C vs C++



## Not in C:

Classes & Objects

Namespaces

New & Delete

Cout & Cin

Data Structures

String datatype

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## printf() Examples

---

```
#include <stdio.h>
int main( ) {
    printf("Hello World");
}
```

---

```
#include <stdio.h>
int i;
for (i = 0; i < 10; i++) {
    printf("i= %d\n", i);
}
```

---

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## String Examples

```
char* text = "Hello";
```

Equivalent to

```
char text[] = {'H', 'e', 'l', 'l', 'o', '\0'};
```

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## String Examples

```
char* text = "Hello";  
char* copy;  
copy = text;
```

Why is this wrong?

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## String Examples

```
char* text = "Hello";  
if (text == "Hello") {  
    ...  
}
```

Why is this wrong?

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## malloc() Examples

```
int *foo;  
foo = (int *) malloc(sizeof(int));  
*foo = 5;
```

...

```
free(foo);
```

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## Bit Twiddling Examples

```
char data = 87;
```

How would you set the 6<sup>th</sup> bit of data?

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## Bit Twiddling Examples

```
char data = 87;
```

How would you set the 6<sup>th</sup> bit of data?

```
data |= (1<<6);
```

also acceptable:

```
data |= (0x40);
```



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## Project 1 Overview

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## Project 1 Overview

Translate to binary:

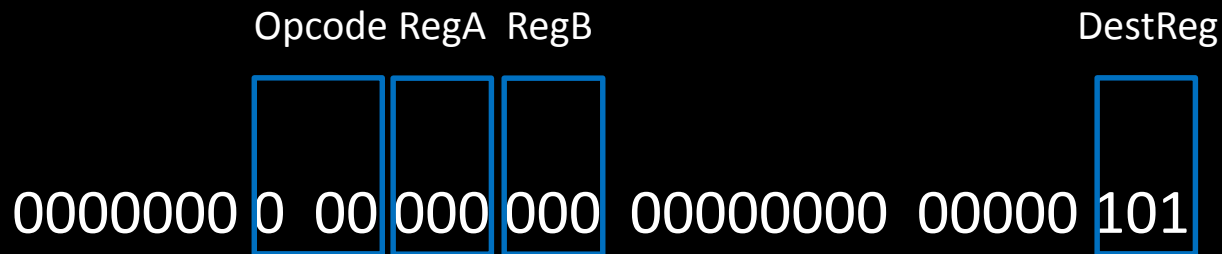
ADD 0 0 5

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## Project 1 Overview

Translate to binary:

ADD 0 0 5



Equals: 0x00000005

Equals:  $5_{10}$

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## Project 1 Overview

ADD 0 0 5 --> 5<sub>10</sub>

.fill 5 -----> 5<sub>10</sub>

What's the difference?