Be a Computer Scientist

Game Programming

1 PROGRAMMING VIDEO GAMES

1.1 Big Budget Games

- Typically use a complicated game engine
- Examples include Unreal Engine (Epic Games), Frostbite (EA), Anvil (Ubisoft)
- I'll be showing a little about Unreal Engine
- Made by many programmers, graphic designers,
 3d modelers

1.2 Our Game!

SPACE RACER

- .3 Our Schedule for the Week
 - 1. Learn basic programming
- 2. Explore 3D modeling
- 3. Learn about how the different parts of games fit together
- 4. Learn basic AI
- 5. Hold a competition!

2 BASIC PROGRAMMING

- **2.1** What is programming?
 - 1. A computer follows instructions one by one
 - 2. A *program* is an instruction set
 - 3. A program might take in *input* from a user
 - 4. A program often returns *output* the user can see

2.2 Machine Code

- The computer reads machine code
- Machine code is hard to write and hard to read
- Sometimes we use it for performance
- For the most part, we run away from it because the "easy" version of it looks like...

```
org
  xor ax, ax
  mov ds, ax
  mov si, msg
boot_loop:lodsb
  or al, al
  jz go_flag
  mov ah, 0x0E
  int 0x10
  jmp boot_loop
go_flag:
  jmp go_flag
msg db "hello world", 13, 10, 0
  times 510-($-$$) db 0
  db 0x55
  db OxAA
```

2.3 Higher Level Languages

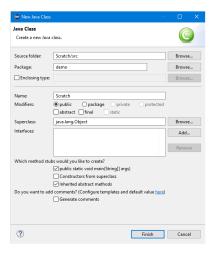
- A higher level language lets you write code that gets converted to something the machine understands
- The language may also check for errors for you
 - Errors at compile time
 - Errors at *runtime*
- Easier to understand, the one we'll be using looks like...

```
public class HelloWorld {
    public static void main(String[] args) {
        // Prints "Hello, World"
        // to the terminal window.
        System.out.println("Hello, World");
    }
```

2.4 *Java*

- High level programming language
- Good choice if working on simple *cross platform* programs
- Is object oriented
- Can work from the *command line*, but we're going to use an *integrated developer environment*

- Making a scratch project
- 1. Open Eclipse (circular icon left side of screen)
- 2. Select "New Project..."
- 3. Make New Java Project
- 4. Then we're going to make a new class



2.6 Variables and Assignment

2.7 *Types of Variables*

```
int aNumber = 54920;
double aDecimalNumber = 43902.3290;
String aSentence = "Hello world!";
char ACharacter = 'c';
```

2.8 Programming Together

- We're going to all program together now
- Programming examples will be provided for the lab section