Intermediate/Advanced Computer Programming
Review

- What command is used to create an executable from C++ source code?
- Name some different types of loops available in C++
- What is the syntax for comments in C++?
- What is the difference between compiling and linking?
- How are classes and objects different in C++?
- Provide an example of creating a class and an object in C++
- Describe the different protection levels for a class in C++
- What is the difference between a declaration and a definition?
Classes and Objects

Accelerate
Brake
Change gear

Gear
Fuel flow rate
Speed
Building an Executable

Source Code

Compiler

Object Code

Linker

g++ -c

Executable
g++

Library
Passing Variables Into Functions

Pass by value

- Variables provided to the function are copies **NOT** the variables themselves

```c
int add(int a, int b)
{
    a = a + b
    return a;
}
```
void add(int a, int b, int result)
{
    result = a + b
}

Passing Variables Into Functions
Pointers
void add(int a, int b, int *result)
{
    *result = a + b
}

Pointers
Pointers

Pointer & (address of)

(dereference)

* 

Pointer

Data

& (address of)

Data
int x = 5;
int *x_ptr = &x;

*x = 7;

cout << x << endl;
Pointers

• Why use pointers?
Const with Pointers

```c
int x = 5;
[const] int * [const] x_ptr = &x;
```
Pass by Reference

An alias for a variable
Acts as if the actual variable were used

```cpp
int x = 5;
int &x_ref = x;

x_ref = 15;

cout << x << endl;
```
int x = 5;
int *x_ptr = &x;

*x = 7;

cout << x << endl;
References

void add(int a, int b, int &result)
{
    result = a + b
}
