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# Basics of C++

## Week 1

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# IO



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# Print Statement

```
#include <string>
```

```
#include <iostream>
```

```
std::cout << "Hello, World!" << std::endl;
```

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# User Input

```
#include <string>
```

```
#include <iostream>
```

```
std::string userInput;
```

```
std::cin >> userInput;
```

```
// Grabs up to the first "value" (I'll explain on the board)
```



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# Variables



# Declaration

Type name;

Type name = value;

const Type name = value;

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# Primitive Types

## Signed

short int, int, long int

int8\_t, int16\_t, int32\_t, int64\_t

float, double

## Unsigned

char, wchar\_t

unsigned (int, short int, long int)

uint8\_t, uint16\_t, uint32\_t, uint64\_t



# Objects

```
#include <string>
```

```
std::string
```

```
#include "MyClass.h"
```

```
MyClass
```

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strings use “”  
char use ‘ ’

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# Arrays



# Declaration

```
Type name[length];
```

```
Type name[] = {a, b, c, d, e};
```

```
// FIXED LENGTH
```



# Use

```
myList[index]
```

```
myList[index] = newValue;
```

```
myList[index]++;
```

```
sizeof(myList) / sizeof(myList[0]);
```

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# Vectors



# Declaration

```
#include <vector>
```

```
std::vector<Type> name;
```

```
std::vector<Type> name = {a, b, c, d, e};
```

```
// DYNAMIC LENGTH
```



# Use

```
myVector.at(index);  
myVector.insert(index, element);  
myVector.back();  
myVector.front();  
myVector.push_back(element);  
myVector.pop_back();  
myVector.erase(index);  
myVector.size();
```

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# Logic





# Operators

## Comparison

<, <=, ==, !=, >, >=

## Logical

&&, ||, !

## Arithmetic

+, -, \*, /, %

++, --

## Bitwise

&, |, <<, >>



# Conditionals

```
if (condition) {
```

```
    ...
```

```
} else if (condition) {
```

```
    ...
```

```
} else {
```

```
    ...
```

```
}
```

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# Switch

```
switch (expression) {  
    case a:  
        ...  
        break;  
    case b:  
        ...  
        break;  
    Default:  
        ...  
}
```

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# Loops

```
while (condition) {
```

```
    ...
```

```
    continue;
```

```
    break;
```

```
}
```

```
for (int i=0; i<length; i++) {
```

```
    ...
```

```
    continue;
```

```
    break;
```

```
}
```

```
do {}
```

```
while (condition);
```

```
for (declare; condition; iteration) {}
```



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# Functions



# Declaration && Use

```
ReturnType name (parameters) {
```

```
    ...
```

```
    return value;
```

```
}
```

```
receptionVariable = name(values);
```



# A Word on Scope

Scopes are created automatically based on function placement!

\*Later on, when learning about objects, you'll see how public and private functions are set.

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# Preprocessing Directives





# #Somethin'Somethin'

#include <import\_name>                   <- Library Import

#include "import\_name"                   <- Current Directory Import

#pragma ...                               <- run a preprocessing command

#define NAME ...                         <- Creates a macro



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# “Hello, World!” Program



# “Hello, World?”

```
#include <string>
```

```
#include <iostream>
```

```
int main() {
```

```
    std::cout << “Hello, World!” << std::endl;
```

```
    return 0;
```

```
}
```



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# Assignment



# Add Up ALL Even Numbers

Use assignment2Data.txt on canvas

Don't bother with file reading, get user input in your program and read from that.