

# Basic C++ Syntax

Troy Serapio

# Variables

- Can store ALL sorts of data
- Data Types
- Simple, yet powerful !!

# Variables (Example)

```
int numBananas = 5;  
long long exabyte = 1e18; // 10^18 is a REALLY big number  
  
bool hasBananas = true;  
string banana = "banana";
```

# Data Types

- `int` → can store integers from  $-2^{31}$  to  $2^{32} - 1$
- `long long` → can store integers from  $-2^{63}$  to  $2^{63} - 1$
- `char` → stores a character
- `string` → array/sequence of `char`
- `bool` → either `true` (1) or `false` (0)

# Operators and Operations

- Allows us to manipulate data to fit our needs
- Incredibly powerful when used correctly and innovatively

# Arithmetic Operators

- Addition:  $+$
- Subtraction:  $-$
- Multiplication:  $*$
- Division:  $/$
- Modulo:  $\%$

# Comparison Operators

- Equals to: `==`
- Not equal to: `!=`
- Greater than: `>`
- Greater than OR equal to: `>=`
- Less than: `<`
- Less than OR equal to: `<=`

# Logical Operators

- AND: `&&`
- OR: `||`
- NOT: `!`
- XOR: `^`



# Assignment Operators

- Assignment: `=`
- Increment: `++`
- Decrement: `--`

# If Statements

- Checks `if` condition is true
- Employs logic into code ( `true` / `false` )

## If Statements (Example)

```
if (numBananas >= 5) {  
    cout << "We have too many bananas!" << endl;  
} else if (numBananas >= 2) {  
    cout << "Barely enough." << endl;  
} else {  
    cout << "Oh no, did you eat my bananas again?!" << endl;  
}
```

# For Loops

- Often used to loop through sequences (arrays, lists, etc.)
- A `variable` that is incremented by some value until it reaches a maximum.

# For Loops (Example)

```
for (int bananaIndex = 0; bananaIndex < numBananas; bananaIndex++) {  
    cout << "Check out my " << bananaIndex;  
  
    if (bananaIndex % 10 == 1) {  
        cout << "st";  
    } else if (bananaIndex % 10 == 2) {  
        cout << "nd";  
    } else if (bananaIndex % 10 == 3) {  
        cout << "rd";  
    } else {  
        cout << "th";  
    }  
  
    cout << " banana!" << endl;  
  
}
```

# While Loops

- Loops until a condition is NOT fulfilled anymore.
- If statement that just loops.

## While Loops (Example)

```
while (numBananas > 0) {  
    cout << "I give one banana to you." << endl;  
    numBananas -= 1;  
    cout << "I have " << numBananas << " bananas left" << endl;  
}
```