FTC Programming

# Basic Programming

## Comments

* A comment is text the computer is told to ignore and often holds helpful explanations of the code for future programmers
* A single line comment begins with //
  + Some code; //Here is a comment
* A multiline comment begins with /\* and ends with \*/

Some code;

/\*

Here’s a multiline

comment

\*/

Some more code;

## Variables

* Variables are things that can hold data.
* Variables allow a value to be stored in memory and recalled throughout the program.
* Variables can be changed anywhere in the program as long as they are declared with the “final” keyword.
* In Java, you must always declare your data type when creating your variable
  + A data type tells Java what kind of information will be stored in the variable
* Some Common data types are:
  + boolean
    - Only stores true or false
    - Generated from comperison operators
    - Example: boolean isReady = true;
  + int
    - Only stores integers
    - Trying to store a decimal in an int will result in an error
    - Can hold any number from -2147483648 to 2147483647 (btw, you don’t need to memorize this although when dealing with big numbers, it’s good to make sure they aren’t too big)
    - Example: int age = 10;
  + float
    - Stores decimal numbers
    - It is accurate up to 6 digits
    - Most of the time we don’t use this for decimal numbers, but the Processing Library uses these
    - Example: float weight = 150.212;
  + double
    - Stores decimal numbers
    - It is accurate up to 15 digits
    - We use this for decimal numbers
    - Example: double volume = 140245.534;
  + char
    - Stores a single character(or letter)
    - When defining a char, use ‘’ around the character
    - Example: char grade = ‘A’;
  + String
    - Stores a chain of letters, such as text
    - Text surrounded “”
    - Example: String name = “Matthew”;

## Operators

### Logic Operators

* &&
  + AND
  + If both are true, then it returns true
  + Else it returns false
  + true&&true = true
* ||
  + OR
  + If both are false, then it returns false
  + Else it returns true
  + True||false = true
* !
  + NOT
  + If true, returns false and vice-versa
  + True! = false

### Math Operators

* Returns a number
* Operators:
  + +
    - Addition
  + –
    - Subtraction
  + \*
    - Multiplication
  + /
    - Division
  + %
    - Modulus
    - Returns the remainder when dividing
    - Example: 17%5 = 2

### Comparison Operators

* Returns a boolean
* Operators:
  + ==
    - Is equal to
  + !=
    - Is not equal to
  + >
    - Is greater than
  + <
    - Is less than
  + >=
    - Is greater than or equal to
  + <=
    - Is less than or equal to

## Decision Making

### If Statement

if(boolean){

// run this if true

}

### If-else Statement

if(boolean){

// run this if true

}else{

// run this if false

}

### Nested if statement

if(boolean){

// run this if true

}else if(boolean){

//run this if true

}else{

//run this if none are true

}

### Switch statement

switch(variable){

case value1:

//run if variable equals value1

break;

case value2:

//run if variable equals value2

break;

default:

//run if none are equal

break;

}

## Loops

# Tele-op Code

# Control Systems

# Drive code