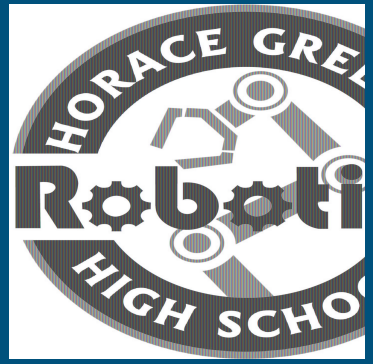


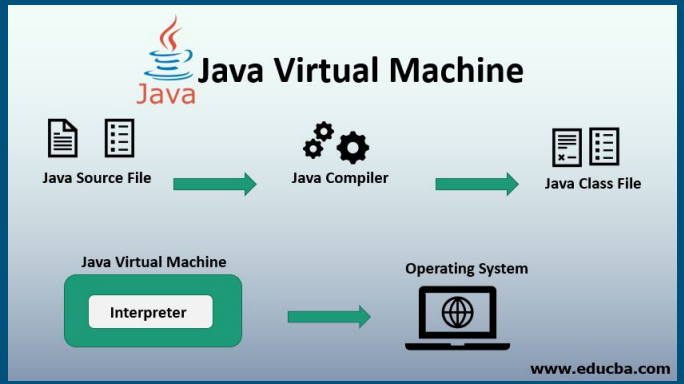
Java Basics

What is Java?

- Java is a programming language that we use to communicate instructions with the computer
- We use Java because of OOP(Object Oriented Programming) and WPILib Support

Text to Code

1. Java source code is written in a text editor and saved with the .java extension
2. Java source code is then compiled into bytecode using a Java compiler
3. Bytecode is interpreted by the Java Virtual Machine(JVM) to run the program



Install Java & VSCode

https://code.visualstudio.com/docs/java/java-tutorial

/*

Insert QR Code

*/

Creating a Java program

- Java file stores Java code for your computer to read
- Java is CASE SENSITIVE
- Files can be named using
  - a-z(lowercase)
  - A-Z(uppercase)
  - $, _
  - 0-9(cannot start with digit)
  - No spaces

Data Types

DATA TYPES	SIZE	DEFAULT	EXPLAINATION
boolean	1 bit	false	Stores true or false values
byte	1 byte/ 8bits	0	Stores whole numbers from -128 to 127
short	2 bytes/ 16bits	0	Stores whole numbers from -32,768 to 32,767
int	4 bytes/ 32bits	0	Stores whole numbers from -2,147,483,648 to 2,147,483,647
long	8 bytes/ 64bits	0L	Stores whole numbers from -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807
float	4 bytes/ 32bits	0.0f	Stores fractional numbers. Sufficient for storing 6 to 7 decimal digits
double	8 bytes/ 64bits	0.0d	Stores fractional numbers. Sufficient for storing 15 decimal digits
char	2 bytes/ 16bits	'\u0000'	Stores a single character/letter or ASCII values

Basic { Syntax }

- Inside a Class file, the first words are always
  - `public class FileName`
- `public static void main(String[] args)` is the main method
- `System.out.println();` allows you to print something

// Comments!

- Single line comments start with //
- Multi line comments start with /* and end with */
- Comments help other programmers understand your code!

System.out.println();

- Printing is a great way to immediately see and test your code
- When printing strings(we'll discuss this later), always use quotations “”

semicolons;

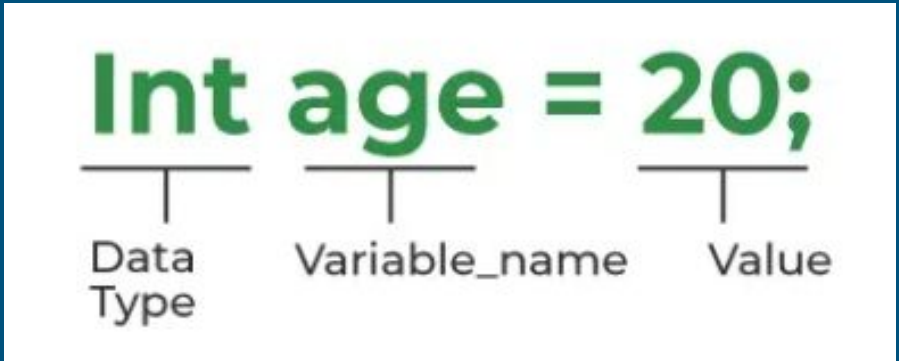
- Semicolons separate each line of code
- Forgetting it will result in a syntax error

Operators +-*/%

Operator	Function
+	Addition
-	Subtraction
*	Multiplication
/	Division
%	Modulus (remainder)

Variables

- Similar to algebra, a variable is a holder for a value
- Each variable stores a value of a certain type



Variable Naming Conventions

- As a team we will be using camelCase
- First word lowercase, and all preceding words Uppercase
- Short, concise names are important and will help readability of code

Using variables

```
public static void main(String[] args) {

    char first_name = 'W';
    char family_name= 'S';

    System.out.println( first_name + " " + family_name);
}
```

Changing variables

```
int number = 123;
System.out.println("The value of the variable is " + number);

number = 42;
System.out.println("The value of the variable is " + number);
```

Kahoot Time!

/*

Insert Kahoot

*/

Additional Resources

- `Coding With John` Java Beginner's Playlist
- `Coding with Mosh` Beginner's Tutorial
- Us!!! Feel free to talk with us, ask a question on Discord, or email us!