Intro to Java

Our First Foray into a “Real” Programming Language

Tim Jackman

BU Summer Challenge

July 8th, 2025

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- Android apps are built using Java or languages that build on it (Kotlin)

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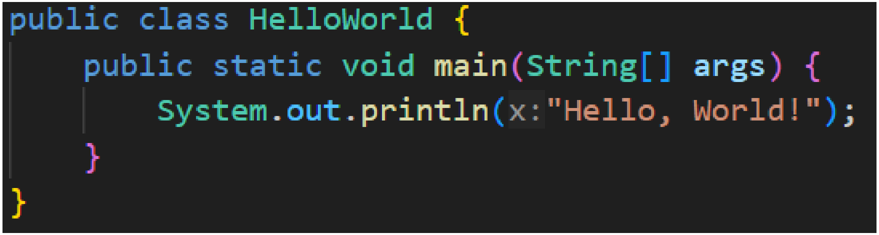
- Statements (lines of code that perform an action) end using semicolons ;. This is required.

Example Class



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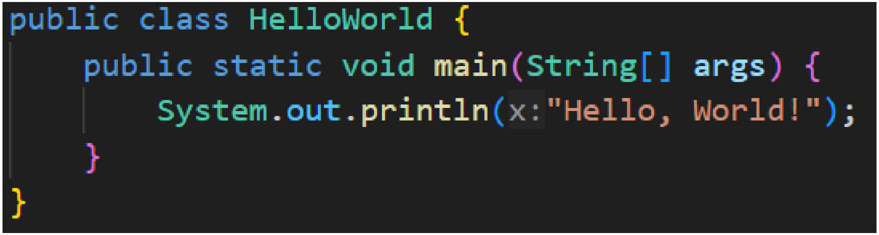

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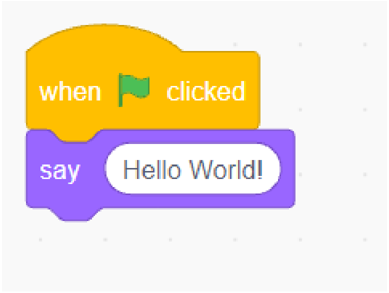

Breaking It Down

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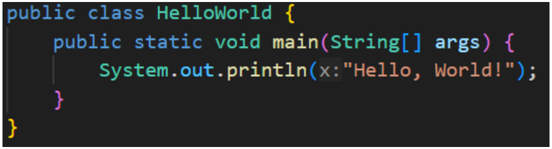

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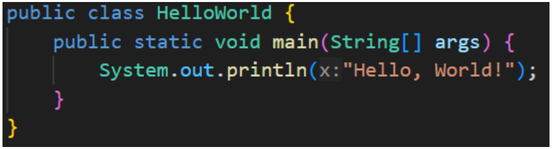

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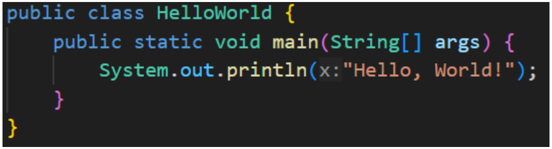

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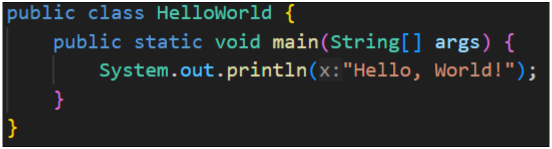

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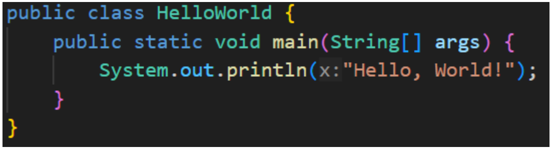

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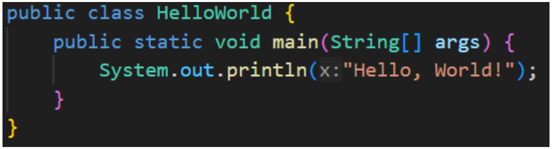
- `System.out.println(‘‘Hello World!’’);` tells the computer to print out the line “Hello World” into the output (terminal)



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How do we run our program?

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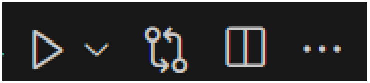

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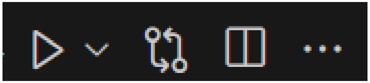

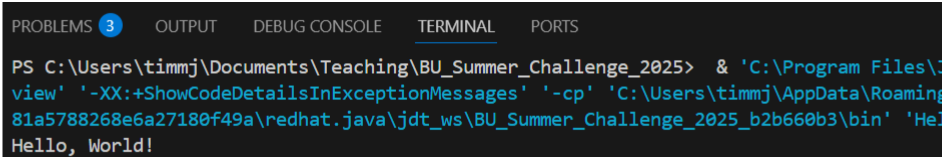

```
PS C:\Users\timmj\Documents\Teaching\BU_Summer_Challenge_2025>  & 'C:\Program Files\J
view' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\timmj\AppData\Roaming
81a5788268e6a27180f49a\redhat.java\jdt_ws\BU_Summer_Challenge_2025_b2b660b3\bin' 'Hel
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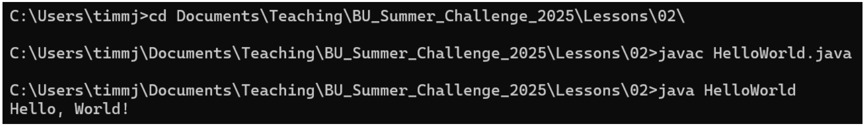
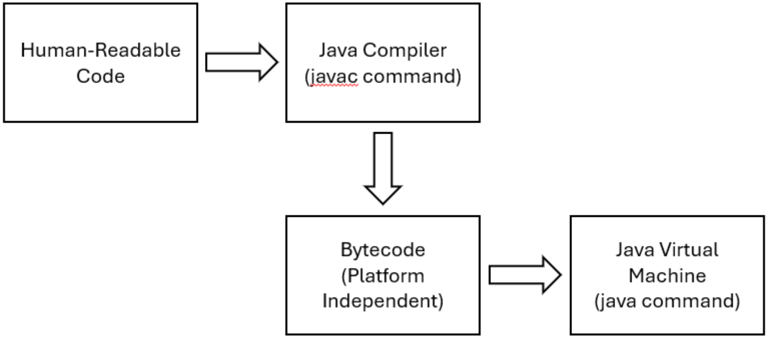


```
C:\Users\timmj>cd Documents\Teaching\BU_Summer_Challenge_2025\Lessons\02\

C:\Users\timmj\Documents\Teaching\BU_Summer_Challenge_2025\Lessons\02>javac HelloWorld.java

C:\Users\timmj\Documents\Teaching\BU_Summer_Challenge_2025\Lessons\02>java HelloWorld
Hello, World!
```

Running a Java Program


Human-Readable Code
Java Compiler (javac command)
Bytecode (Platform Independent)
Java Virtual Machine (java command)

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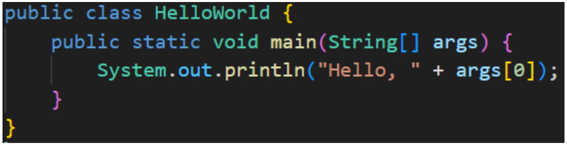

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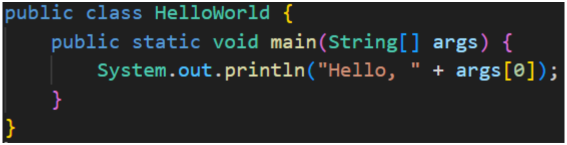

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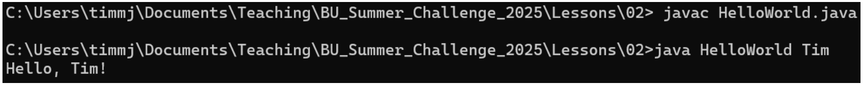

```
C:\Users\timmj\Documents\Teaching\BU_Summer_Challenge_2025\Lessons\02> javac HelloWorld.java

C:\Users\timmj\Documents\Teaching\BU_Summer_Challenge_2025\Lessons\02>java HelloWorld Tim
Hello, Tim!
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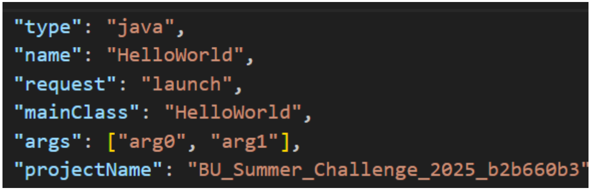

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"type": "java",
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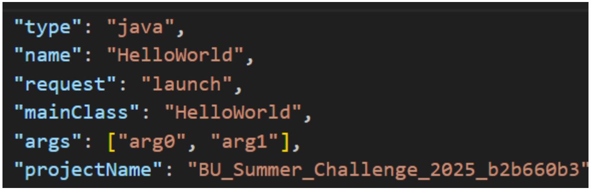

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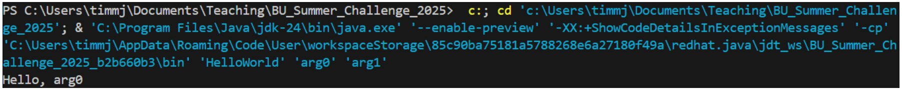

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- This allows the compiler to check for any type errors before we ever run any code

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- Number comparison operators are `<, <=, ==, !=, >=, >`

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- If you want *exclusive or* (exactly one of the two is true), you can use ^or ! =

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- To call these methods, you use the *dot operator* on a specific String, followed by the method name: `‘‘Hello’’.length()` evaluates to 5

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- Most Reference Types are *classes* (we will explore what that means later in the seminar)
- However, the String class has special built in support and are therefore like pseudo-primitives
- Strings are essentially ordered lists of chars, and are written by wrapping chars with double quotes: "hello"
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- You can check the Java Documentation to see all of the methods and how they work

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- But 5% of the time your program will be wrong and you'll be confused!

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- Naming Conventions: lowerCamelCase for regular variables, UPPER_SNAKE_CASE for constants (e.g. `double PI = 3.14;`)

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- All Reference Types will have a built-in .toString() method to convert to String

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- `Math` and `Integer` are some classes with useful static methods

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- At the end of a loop iteration, statementC is run: typically incrementing the temporary variable

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- We have a lot of control here with the third statement

Challenge

- Create a FizzBuzz file that when run prints the integers 1 through 100, replacing multiples of 3 with Fizz, multiples of 5 with Buzz, and multiples of both with FizzBuzz.
- As an extra challenge, modify the program to take a command line argument for the upper bound (e.g. `java FizzBuzz 45` does 1 through 45). You'll need to look at the Integer class documentation to find a helpful static method.
- As an extra extra challenge, modify it to loop through only the even integers, and replace multiples of 6 and 10 with Fizz and Buzz (and FizzBuzz)!