



```
void main() {  
    IO.println("Hello, world!");  
}
```

Introduction to Java

Java Fundamentals

Agenda

Java Background
What Is Java?
Compilation
History
Design Principles

Java Design
Language Type
Why Static Types?
Java Project Structure

Java Background

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- Compiled code is typically not human-readable

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- System independent, and code can be analyzed and changed at runtime

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Variables have fixed data types which must be known at compile-time

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Create many types of applications

- Object-oriented programming (OOP) (mainly)
- Imperative programming
- Some functional-programming features

Java Terminology

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- *Java bytecode* is what compiled Java code is called

Java Terminology

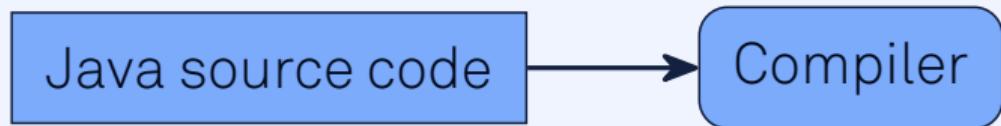
- *Java bytecode* is what compiled Java code is called
- The virtual machine used to execute Java applications is known as the *Java virtual machine (JVM)*

Java Compilation

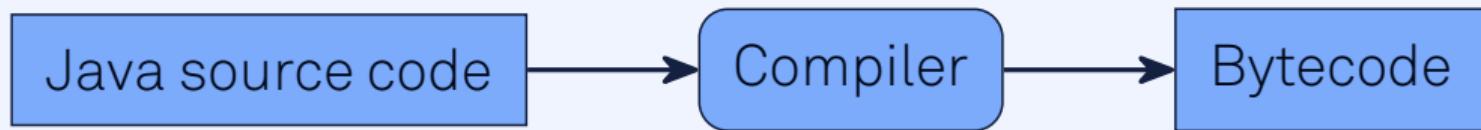
Java Compilation

Java source code

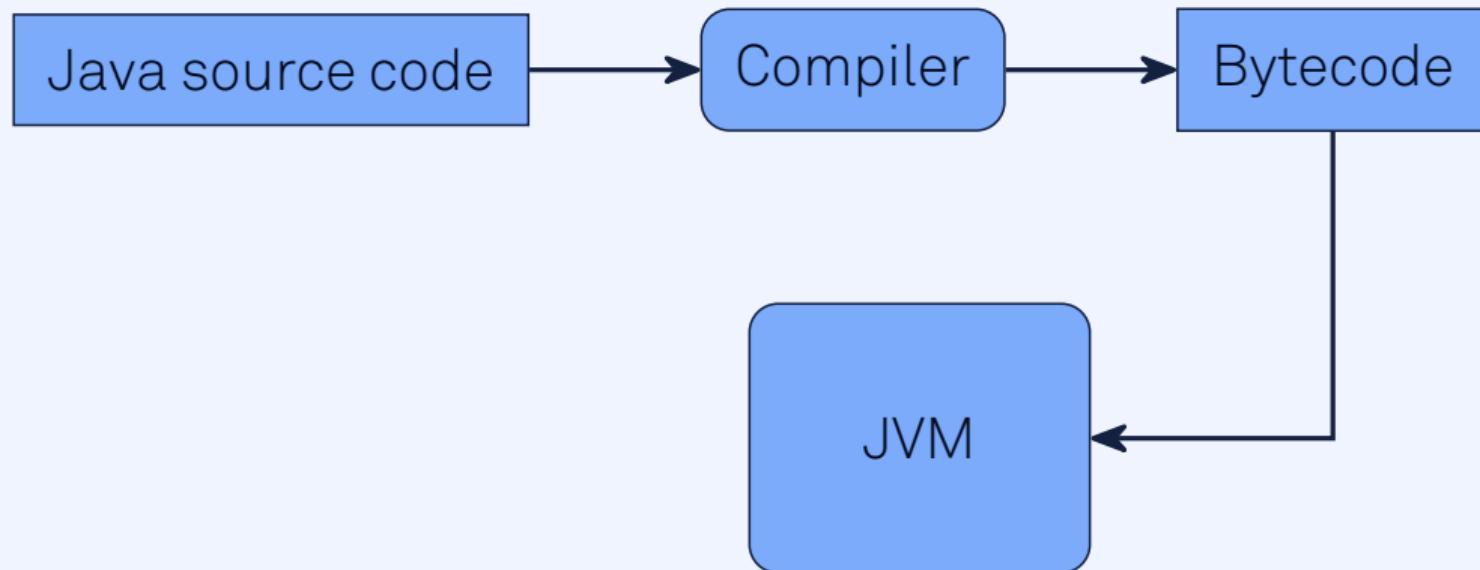
Java Compilation



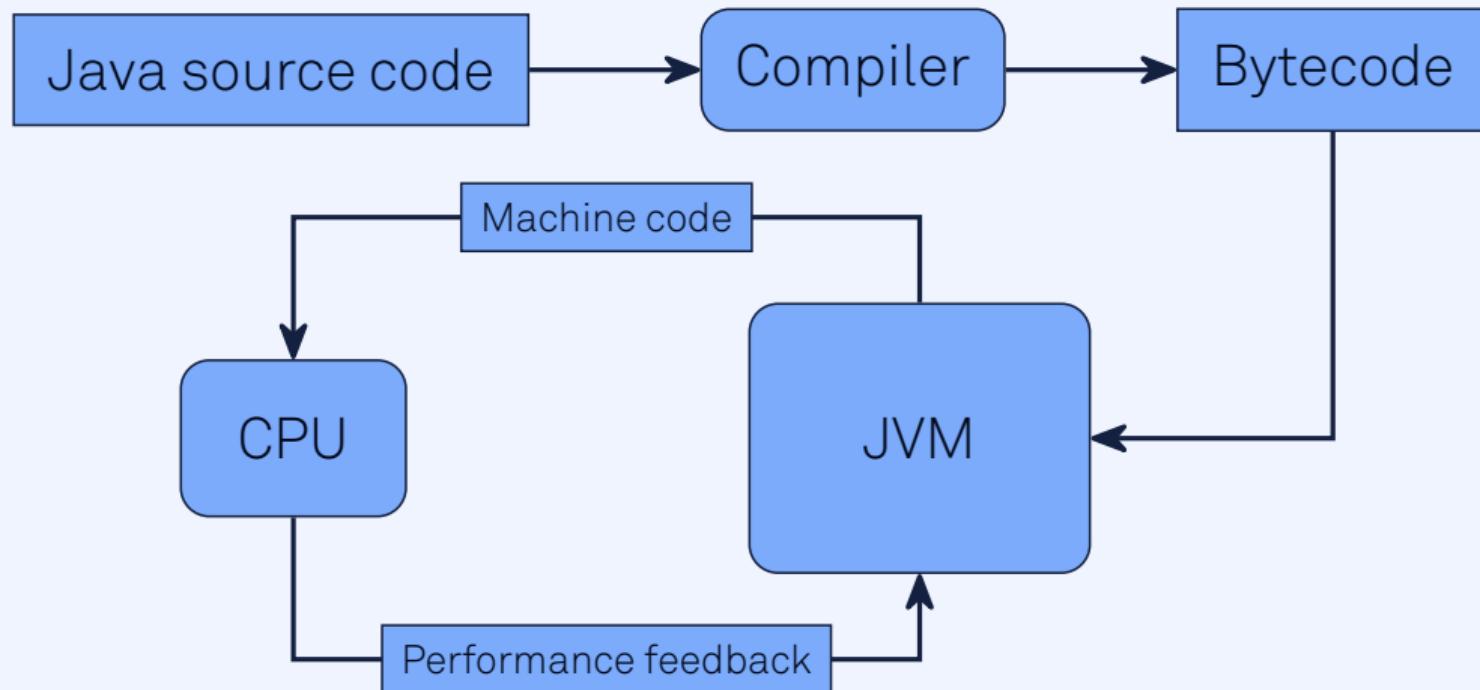
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- C# (Microsoft) was heavily based on Java, but it is now significantly different

Design Principles

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- It must execute with high performance
- It must be interpreted, threaded, and dynamic

Java Design

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- It's a *high-level* language compared to C and a *very high-level* language compared to Assembly language

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 - Remove details about hardware control

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 - Automated memory management (garbage collector)

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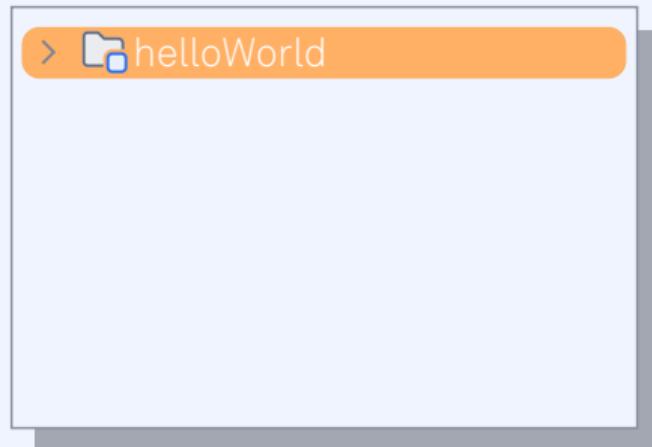
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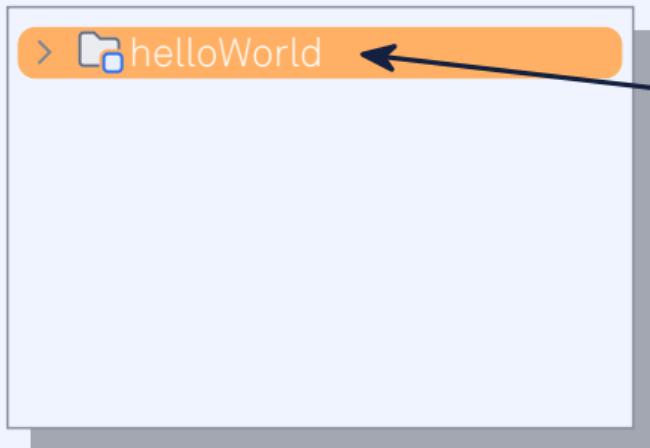
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 - TypeScript/JSDoc comments

Java Project Structure

Project Structure

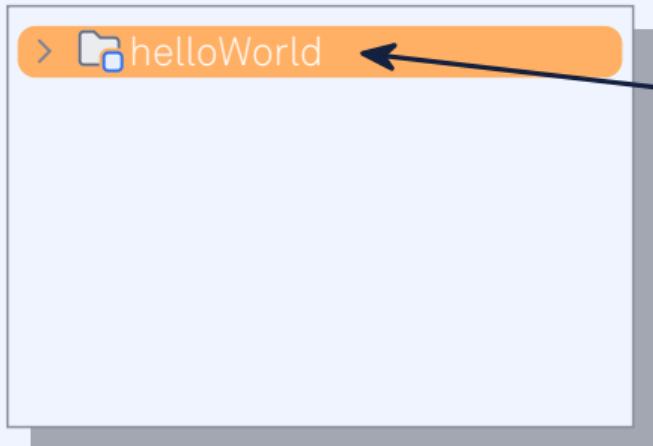


Project Structure



Java project directory

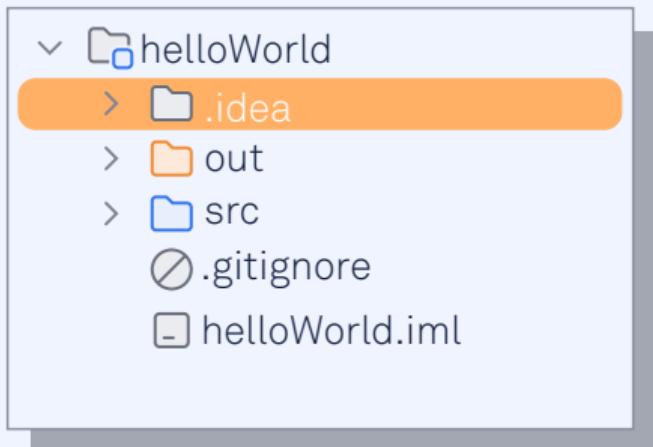
Project Structure



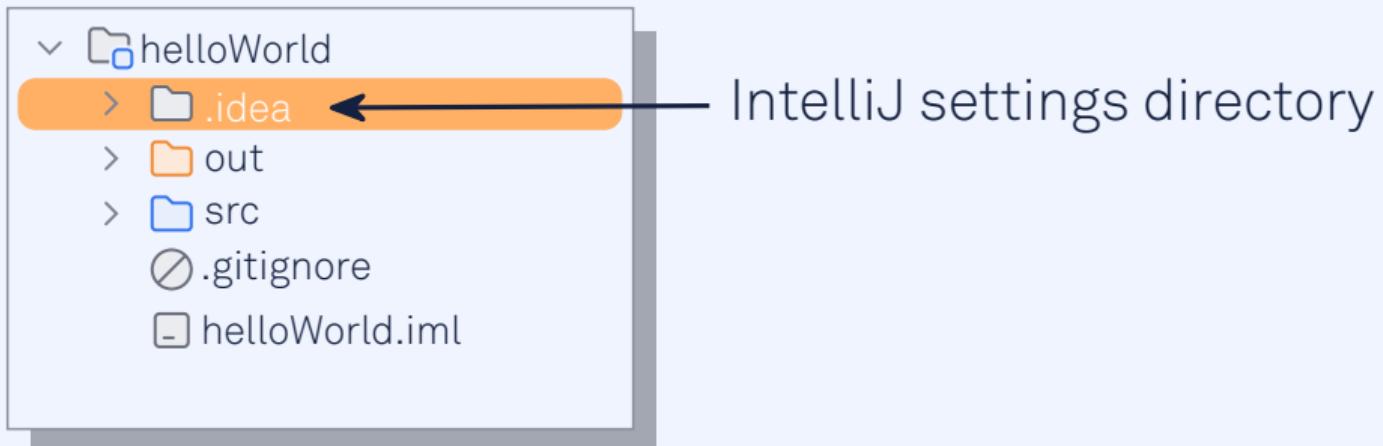
Java project directory

- This directory holds everything for a Java project

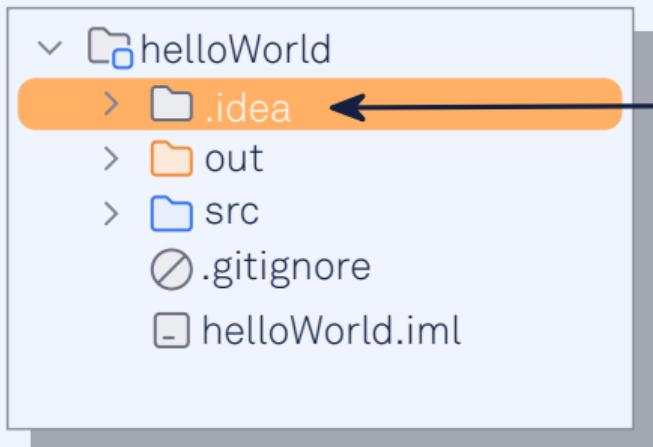
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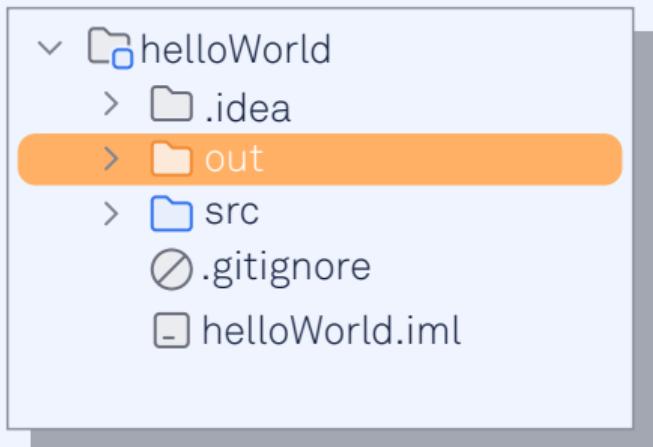
Project Structure



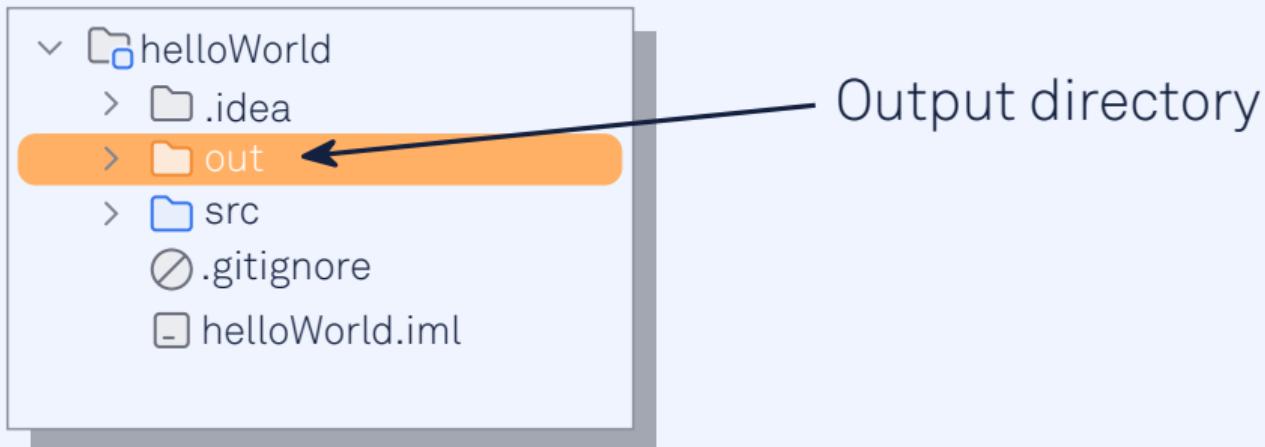
IntelliJ settings directory

- This directory holds IDE settings.

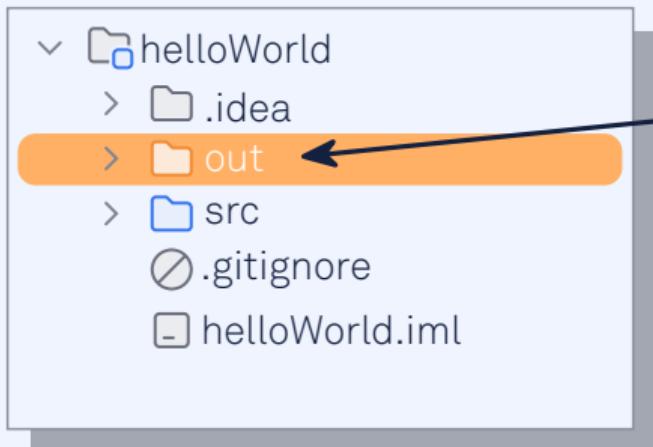
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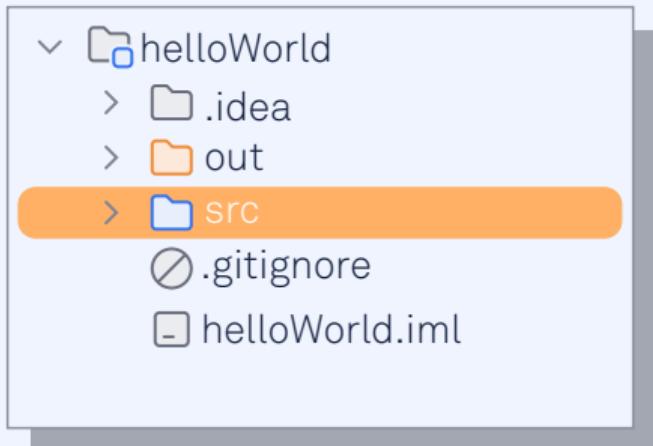


Project Structure



- Output directory
- This is where the bytecode generated by the compiler goes

Project Structure



Project Structure



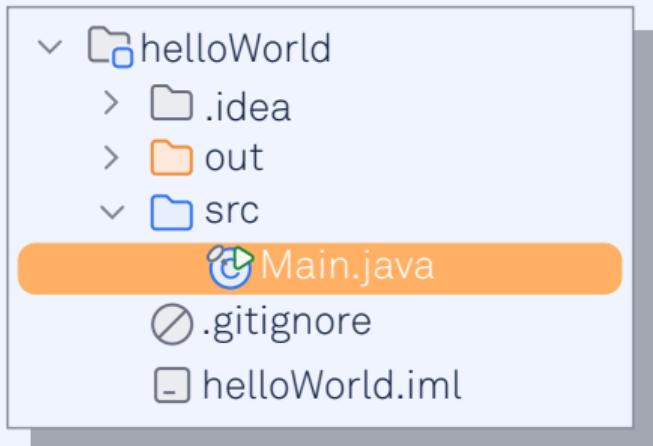
Source directory

Project Structure

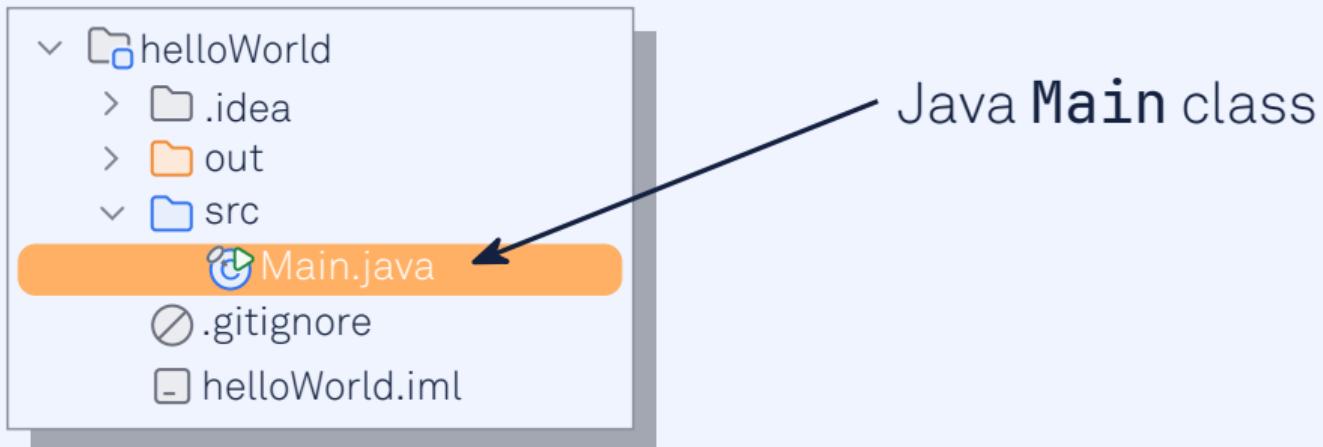


- Source directory
- This is where the Java code goes

Project Structure



Project Structure

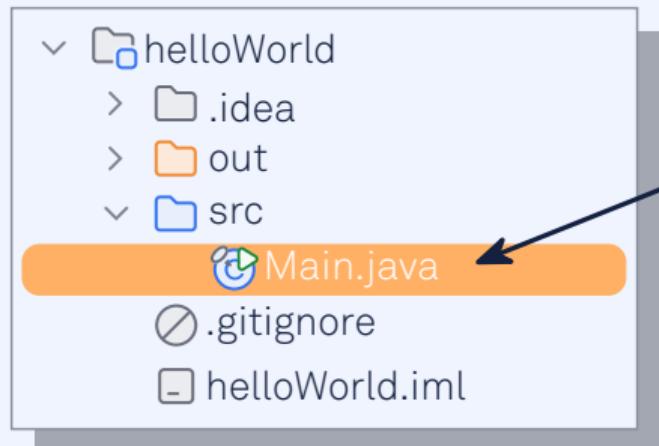


Project Structure



- Java **Main** class
- This is the main class for a basic console application

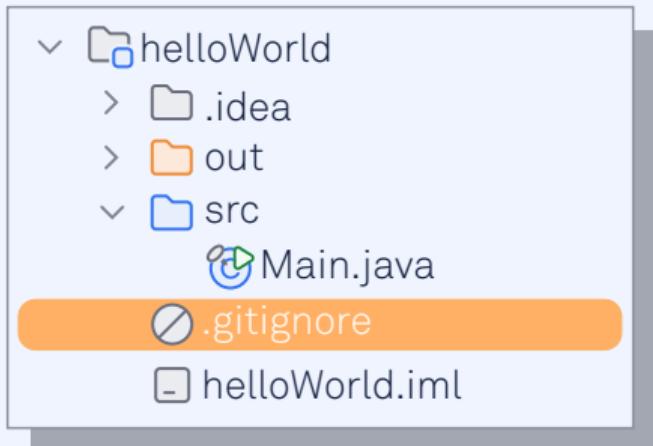
Project Structure



Java Main class

- This is the main class for a basic console application
- This is where the code from the title slide goes

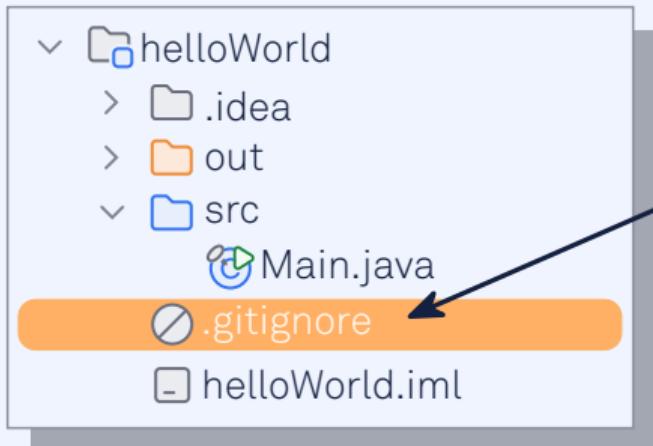
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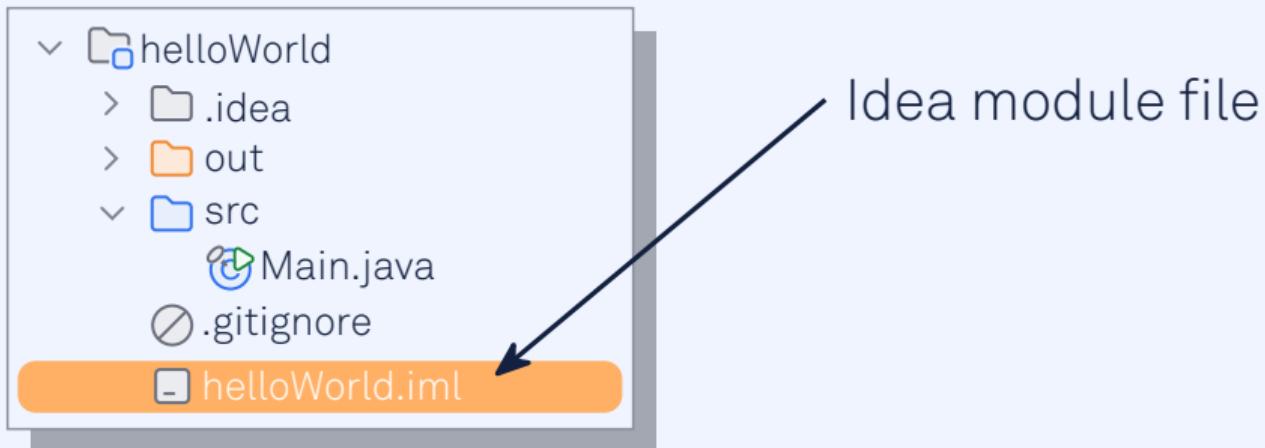
Git ignore file

- This file is used when uploading to a remote repository

Project Structure



Project Structure



Project Structure



- Idea module file
- This file manages more IDE settings

Any Questions?