Working with IntelliJ IDEA

Student Workbook

Version 2.0 Y

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Module 1

IntelliJ Basics

Section 1–1

IntelliJ

Understanding IntelliJ IDEA

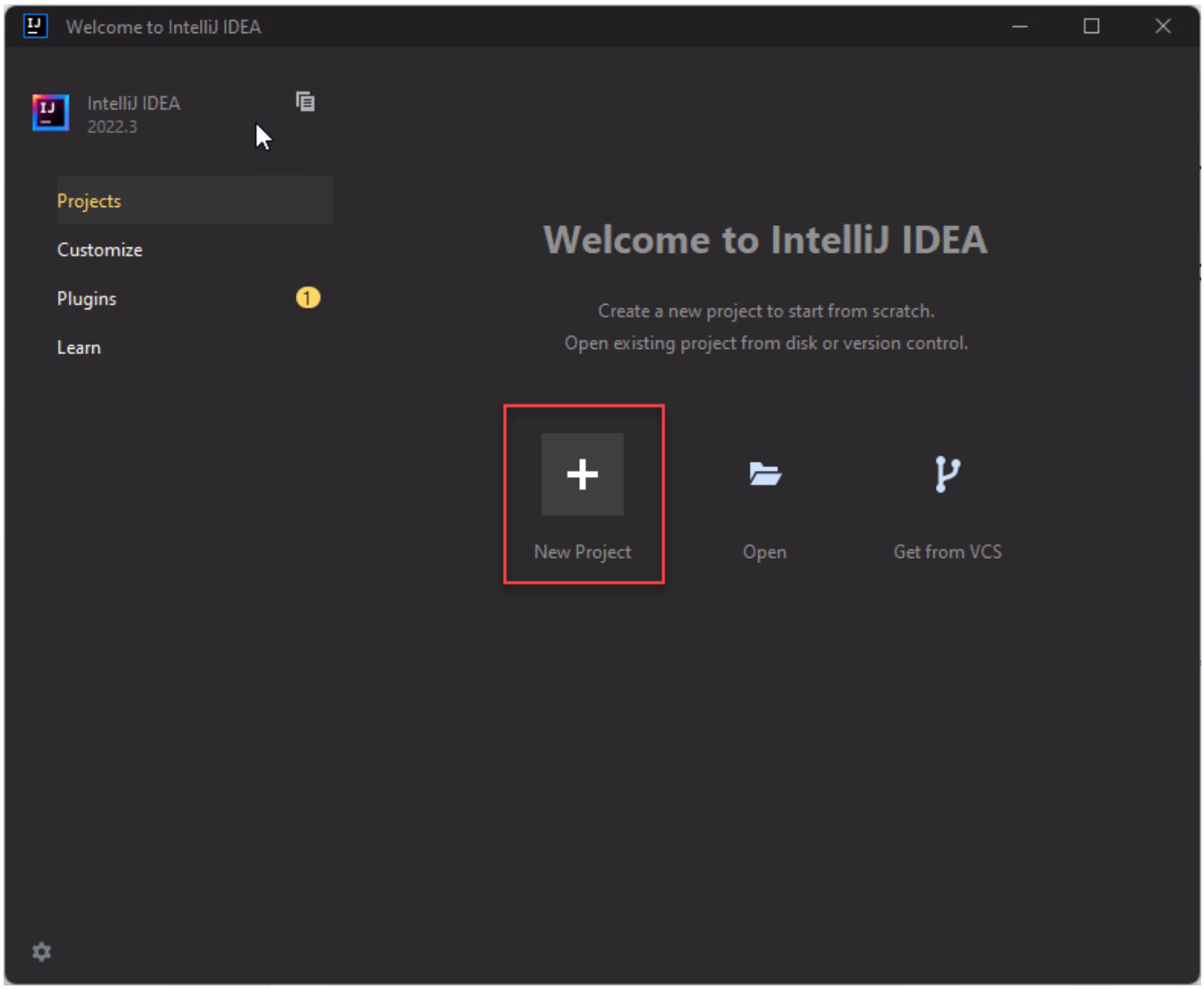
- **Integrated Development Environment - A program that contains comprehensive utilities to develop software**
- **The leading IDE for Java and Kotlin development**
  - Run, Test and Debug Java projects
  - Integrated with Git
- **Plugins available to customize and extend your environment**
- **A product of JetBrains**
  - Free Community Edition or paid Ultimate Edition

Java Projects

- **A Java Project is just a folder that contains all of the project files**
- **Java source code**
- **IntelliJ manages all types of Java projects and build tools**
  - There are a few different project build management tools
    * Maven – currently the most popular build manager for java
    * Gradle
    * Ant
- **Multiple ways to create projects**
  - Create the project directly from IntelliJ
    * IntelliJ will build the appropriate folder structure and starter files
  - Import a project from a VCS – such as Git
  - Create a project manually, then open it in IntelliJ
    * Projects can also be created with tools like Maven

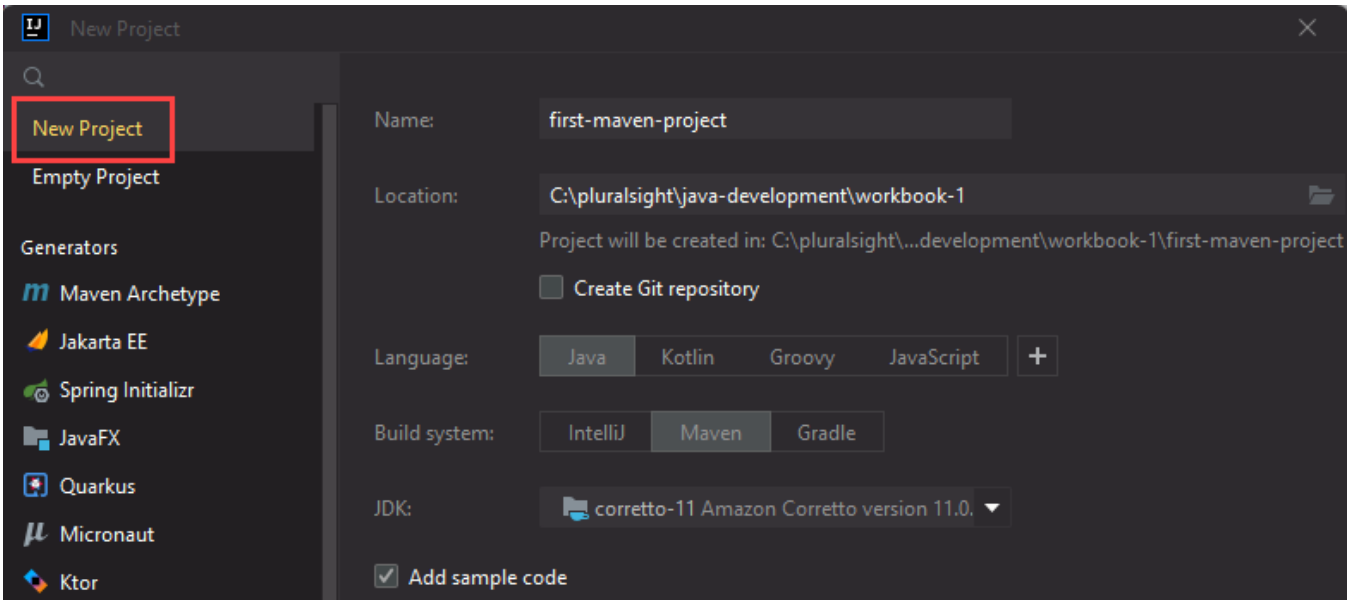
Creating a New Java Project

- Open IntelliJ and select Projects -> New Project



The New Project Dialog

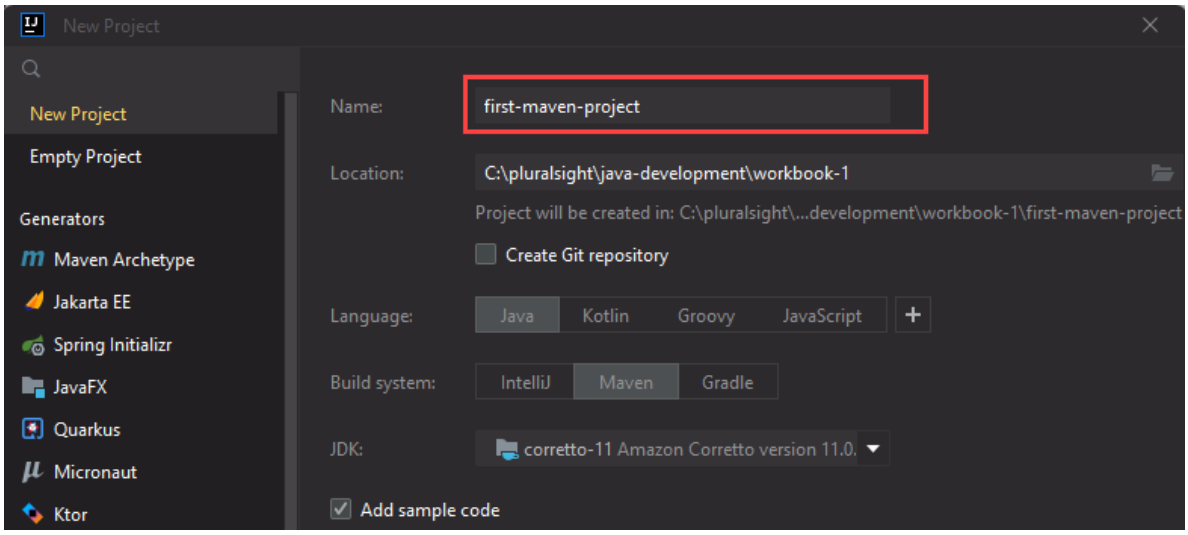
- **The New Project dialog lets you choose from various ways to create and initialize your project**



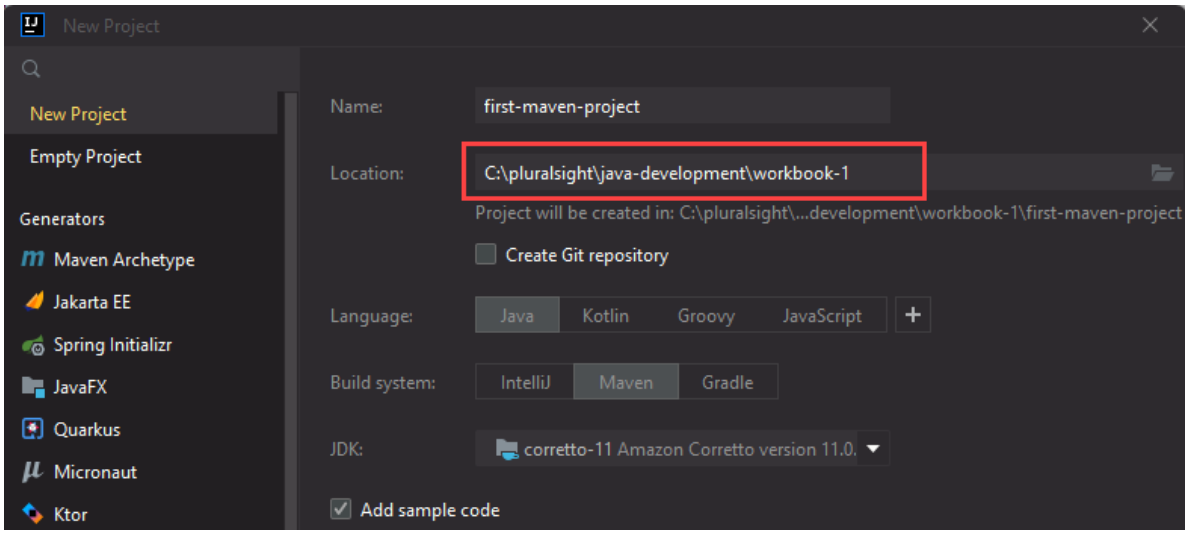
  - New Project creates a basic project with some minimal starter code
  - Empty Project creates the project folder only; all other configuration must be added manually later
  - Generators are specialized project templates
    - These allow you to create projects with significant pre-generated boilerplate (or starter) code

Project Name and Location

- Enter a Project Name



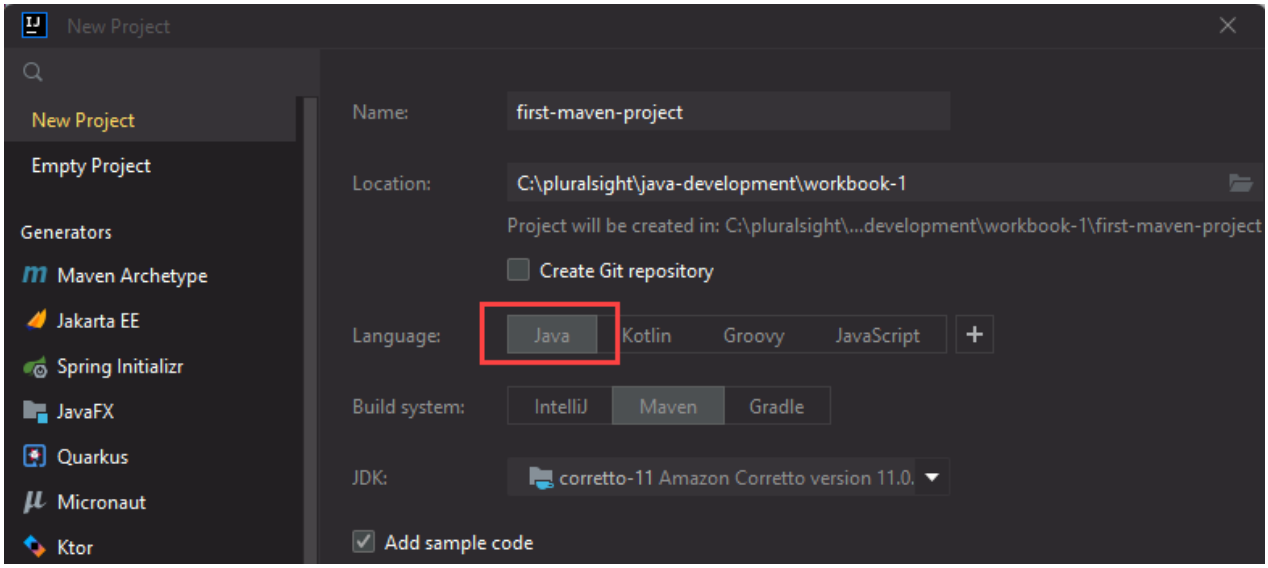
- Select the directory/folder where the project will be saved



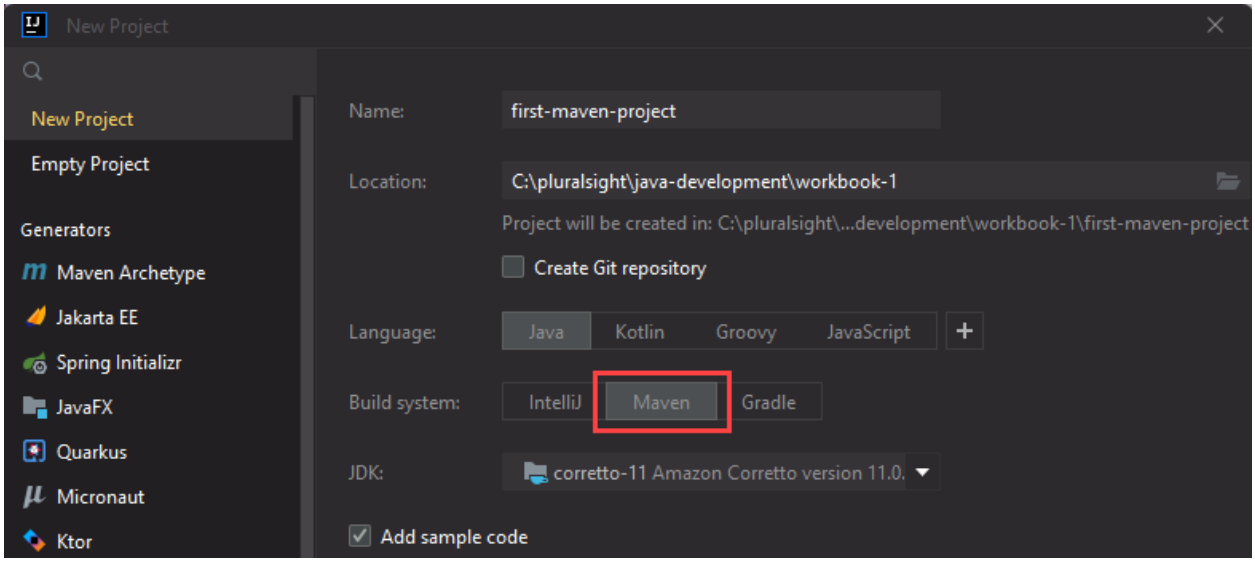
- You can choose whether or not to create a local Git repository to hold the project code

Project Language and Build System

- Select the project language

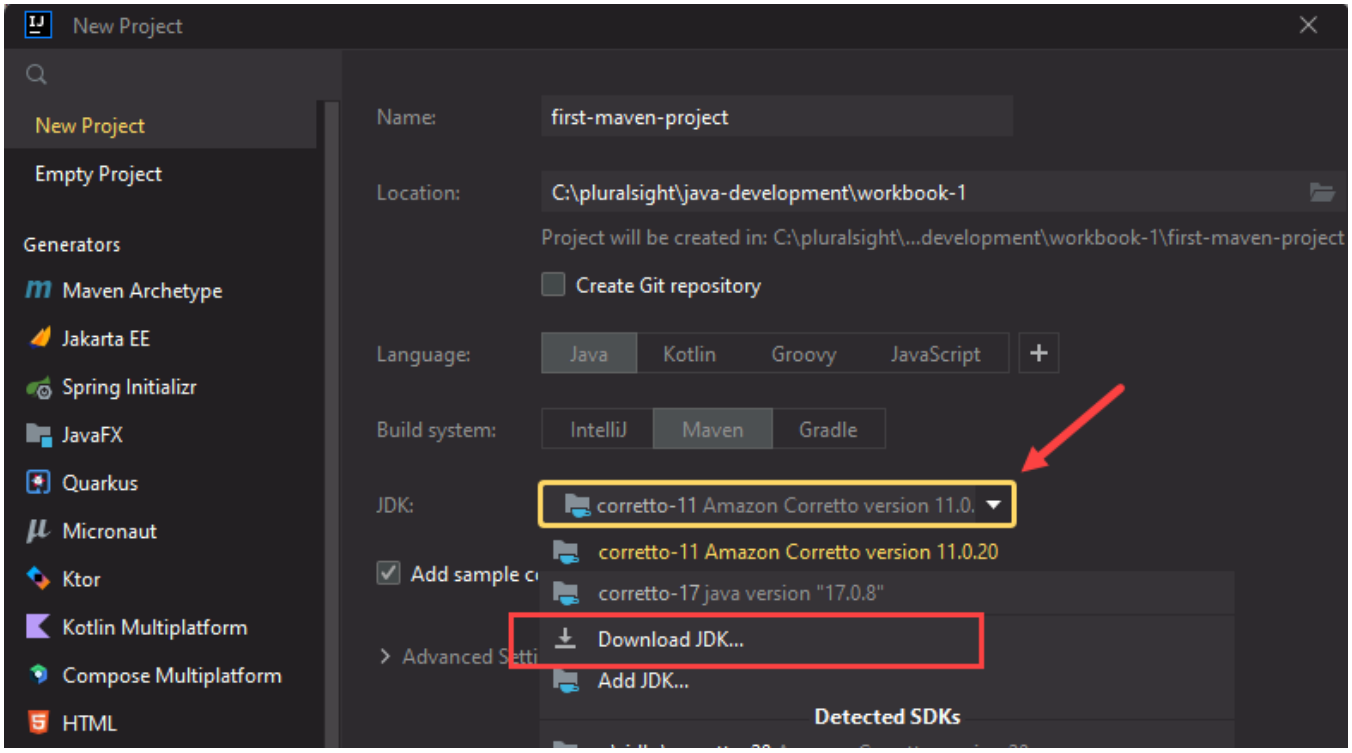


- Select the project build system



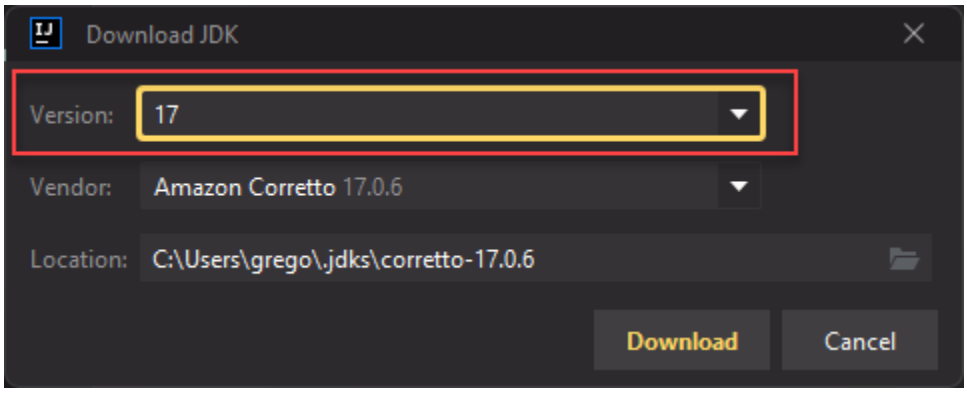
Select the Java Version

- **We will be using Java 17 during this course**
  - If you do not have the Java 17 JDK, IntelliJ will give you options to download and install it directly

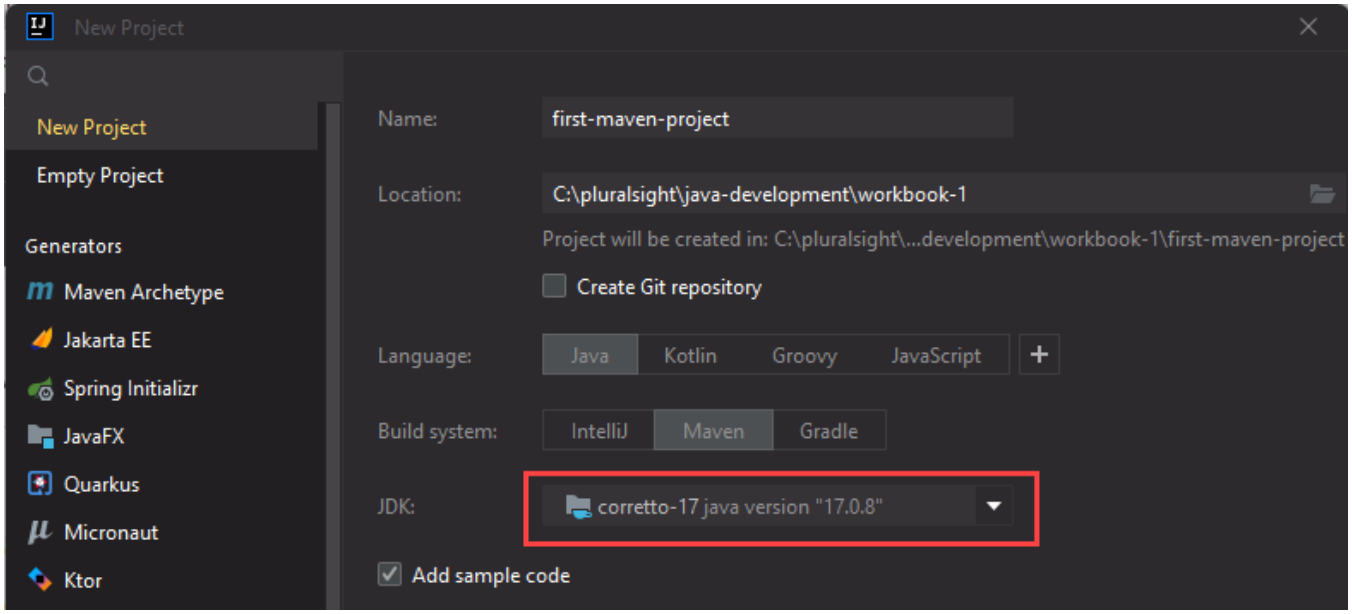


Installing JDK 17 (If Necessary)

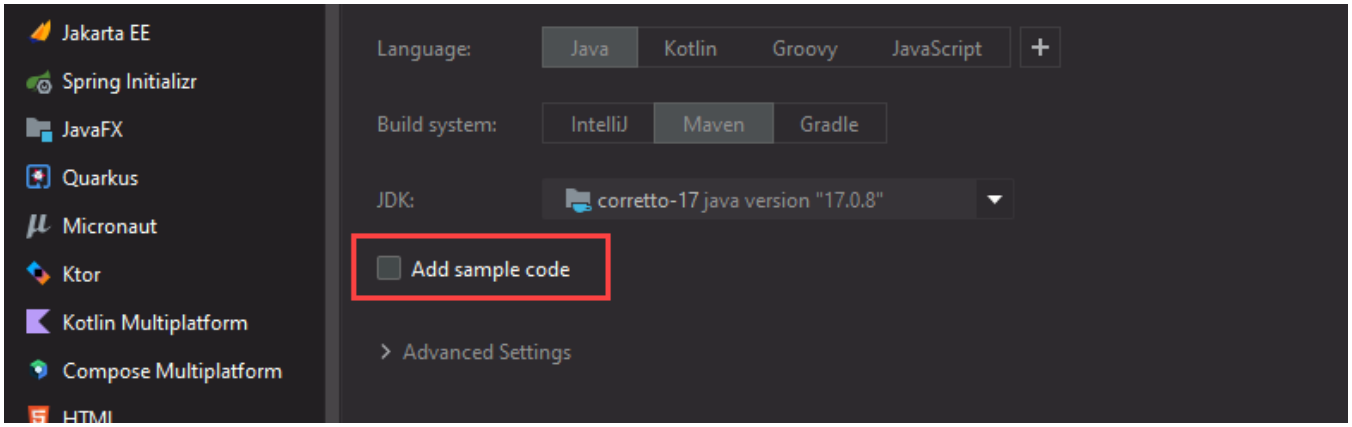
- Select and download the Java 17 JDK



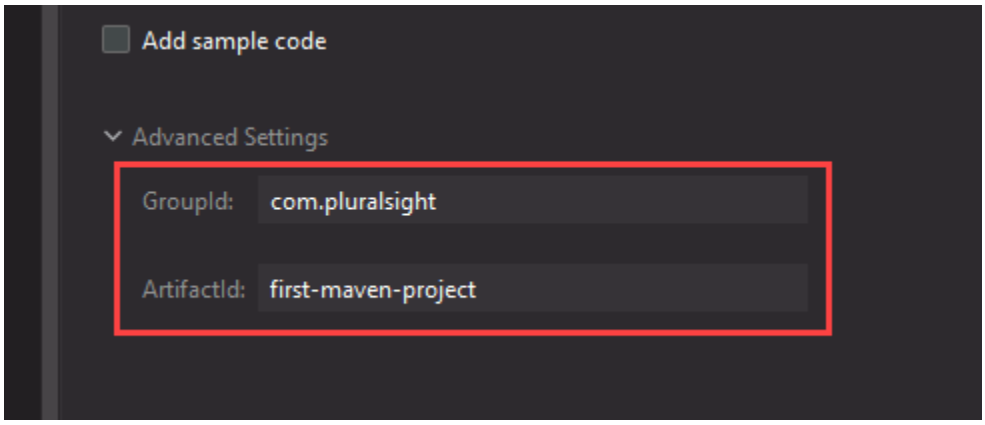
- Ensure that JDK 17 is selected



- Uncheck **Add sample code**



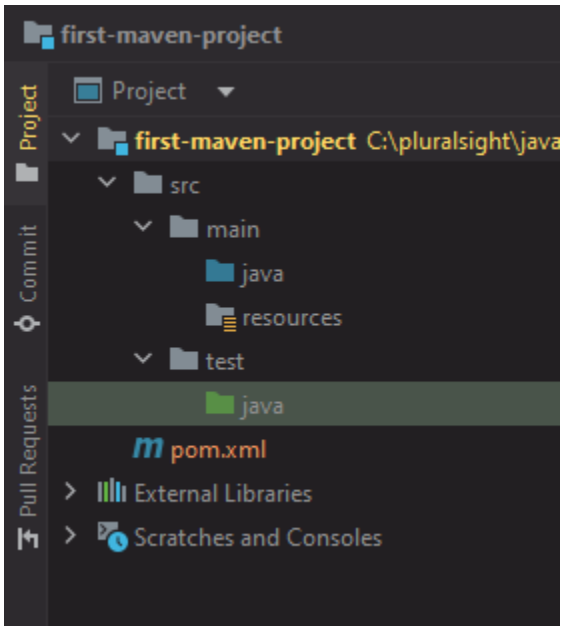
- Expand the Advanced Settings tab and update the **GroupId** and **ArtifactId**



- Click Create

Explore the Project

- After creating the project IntelliJ will open the project folder



- This folder structure is the standard structure for Maven Projects

```
First-maven-project/
    ├── pom.xml
    └── src/
        └── main/
            └── java/
        └── test/
            └── java/
```

The `pom.xml` file

- **The `pom.xml` file is a Maven file that is used to define**
  - project configurations (name, version, jdk build version, etc)
  - a list of external project dependencies

pom.xml

```xml
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>

    <groupId>com.pluralsight</groupId>
    <artifactId>first-maven-project</artifactId>
    <version>1.0-SNAPSHOT</version>

    <properties>
        <maven.compiler.source>17</maven.compiler.source>
        <maven.compiler.target>17</maven.compiler.target>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
    </properties>

</project>
```

- **We will learn more about this file later in the cohort**

Maven project folder structure

- **All application code must be added to the `src/main/java` directory**

- **Unit tests are added to the `src/test/java` directory**
  - You will learn more about unit tests later in the cohort

Adding a package

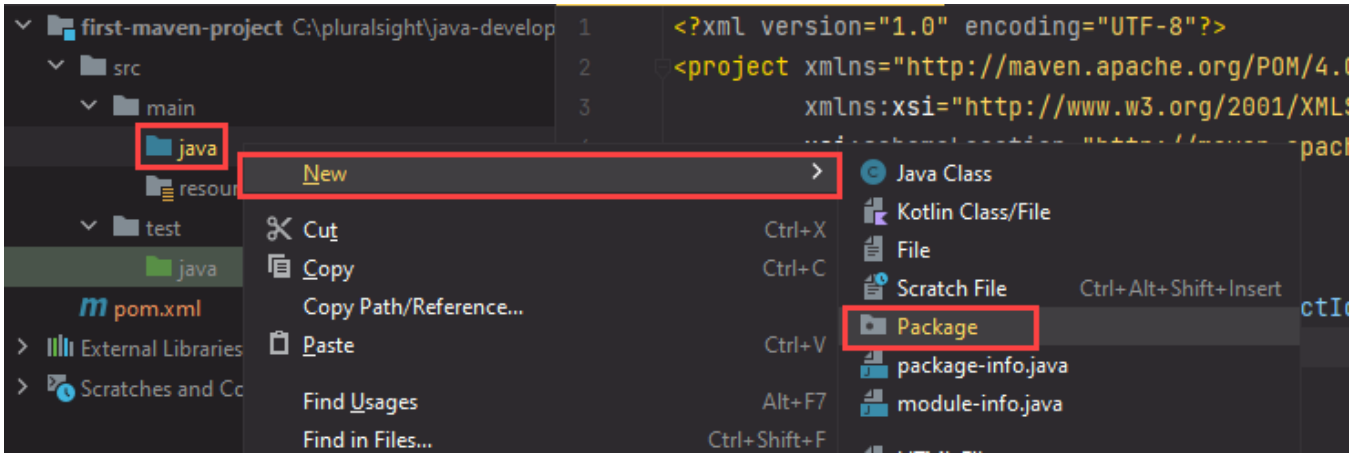
- **Packages appear as folders in a Java project**
  - They allow us to organize our code
  - Packages names are all lower case and follow the following convention

    `com.companyname.projectname`

- **Each dot in the package name implies a subdirectory in the java source tree**

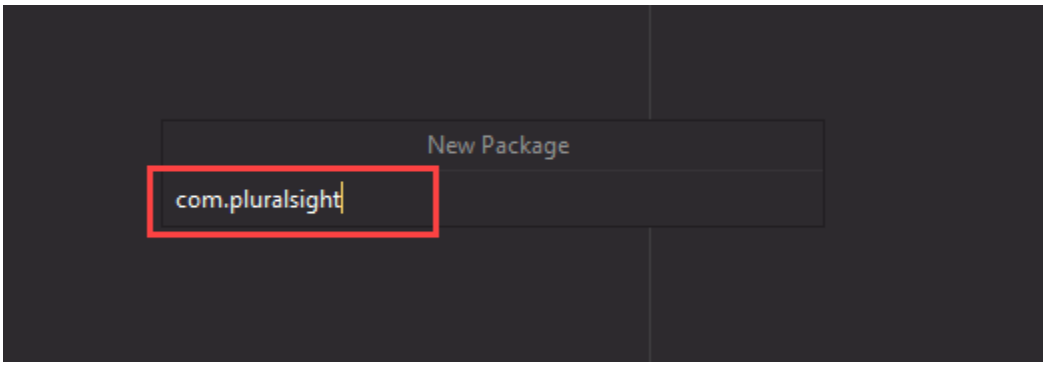
- **Packages are added relative to the `src/main/java` folder**
  - All Java projects *should* have at least one package
    - i.e. we should not add a Java file directly into the `java` folder

- **Create a package by right-clicking on the `main/java` folder and select New -> Package**

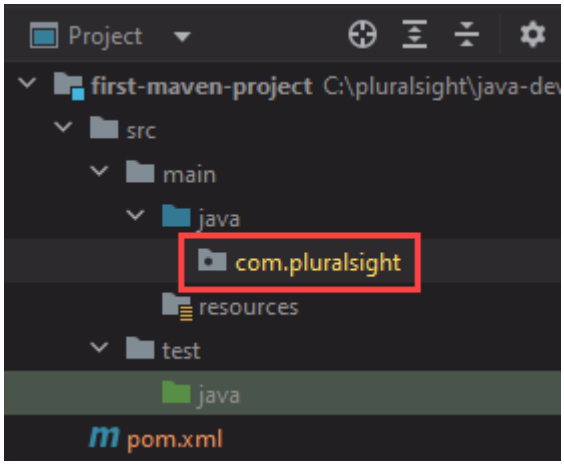


Set the package name

- Add a package name in the **New Package** window and hit **Enter**



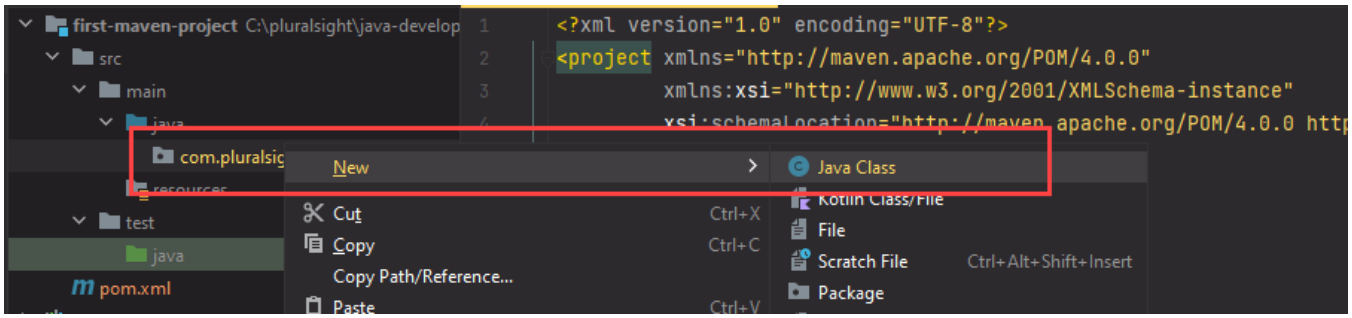
- A new **Package** will have been created for you



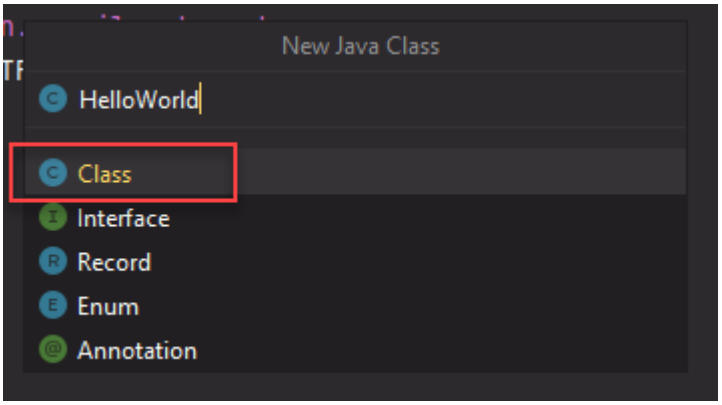
Creating a class

- Now that you have created the package, you can create a class in the package.

- **Right-click** on the package you just create in the **Project Explorer** on the left hand window. Select **New -> Java Class**

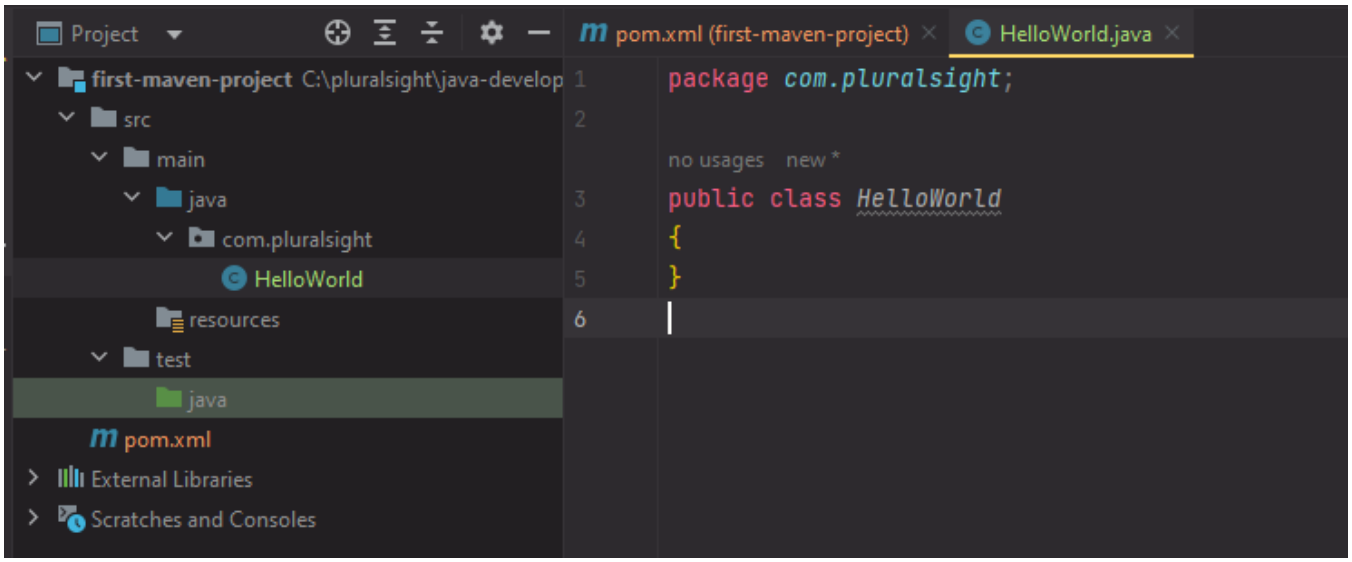


- In the **New Java Class** window enter the name of your class and hit **Enter**
  - Class names always start with an uppercase letter



The Java source file

- Your new class will be created and open in IntelliJ



Finishing the Application

- A Java application must have an **Entry Point** into the application in order to run it
- The **Entry Point** is a function named main, defined like this

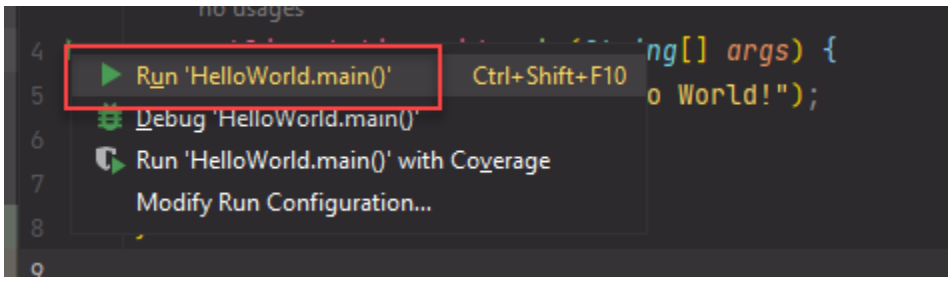
```
public static void main(String[] args) {
   // your code goes here
}
```

- Finish the HelloWorld project

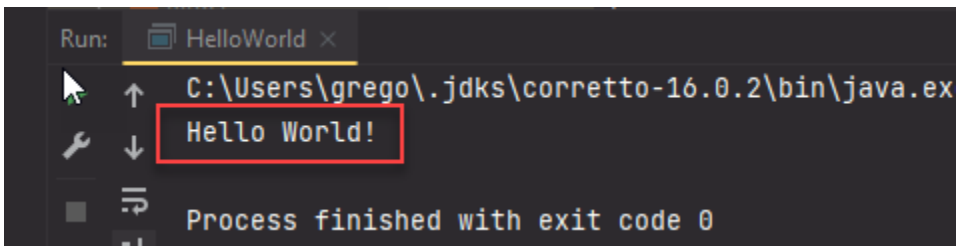
Running your Application

- Once you have added the `static void main` function, a green arrow appears next to that function

- At any time, you can click on the green arrow, to run your application

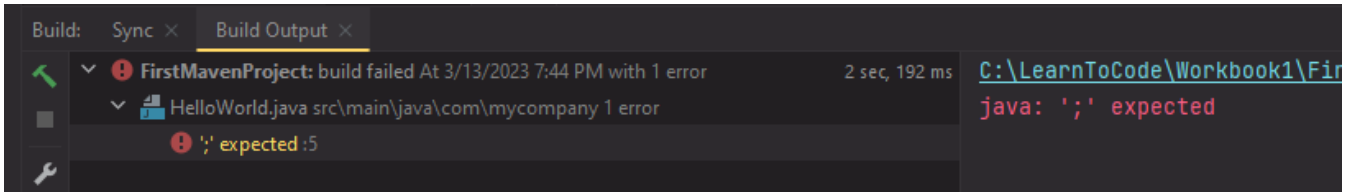


- This should immediately print the results at the bottom of the window



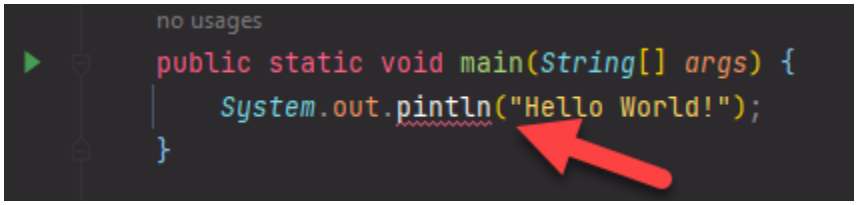
Detecting and Fixing Errors

- **If your application does not run, it is most likely because of an error in your code**
  - IntelliJ can help find errors quickly
- **When you attempt to run the application you may get a compile error message**

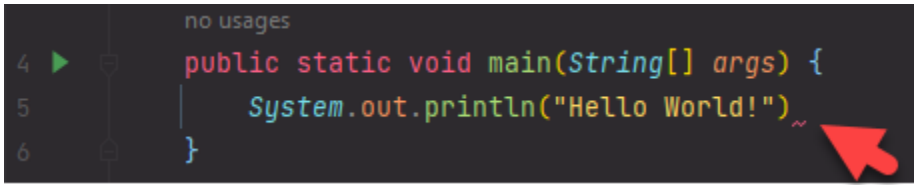


Common Errors

- **Misspelled functions or variables**
  - Missing "r" in `println()`



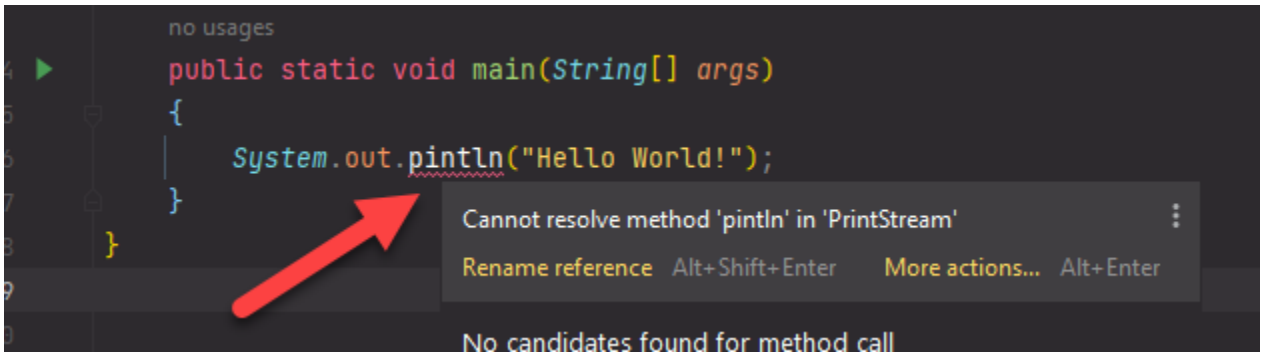
- **Missing semi-colon at the end of a line**



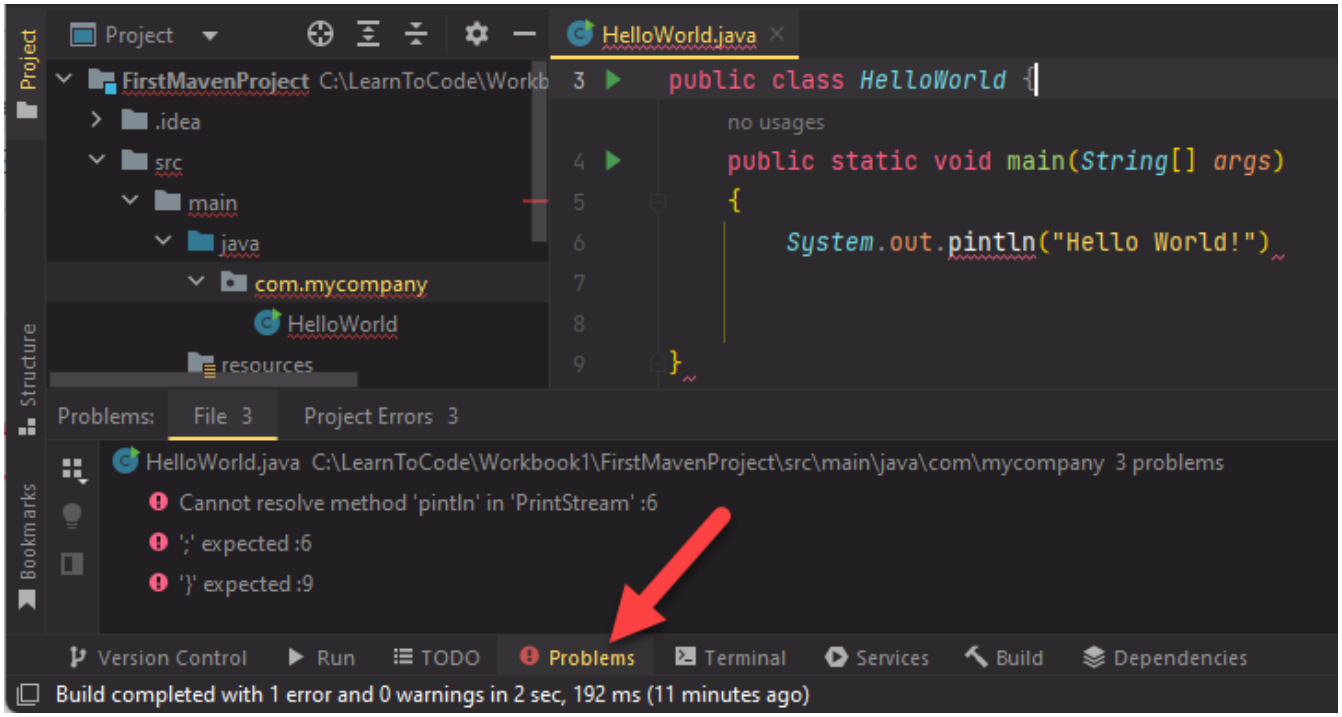
- **Missing close curly brace**
  - Here the compiler believes that the function has a close curly but the class is missing one

Lean on Your Tools

- DO read the error messages; they really want to help!
- You can also hover over the **red squiggly** line to get information about the error



- Additionally there is a **Problems** tab at the bottom of IntelliJ that will list all potential problems with your code



Exercises

Complete the following exercise by adding the new project into the `C:/pluralsight/java-development/workbook-1` folder.

EXERCISE 1

Using IntelliJ, create a new Java application that will list at least 10 items that should be on your shopping list.

1. Create a new package named `com.pluralsight`
2. In the `com.pluralsight` package create a new java class named `ShoppingList`. Remember it must be in a .java file of the same name.
3. Within the `ShoppingList` class, create a `main` method.
4. In the `main()` method use the `System.out.println()` to display a shopping list with at least 10 items.
5. Run the program. If there are any errors, fix them and run it again.
6. Push your changes to GitHub (always stage, commit and push your changes)
   i. `git add -A`
   ii. `git commit -m "completed ShoppingList app"`
   iii. `git push origin main`