**Java-Java: 00 - Introduction**

**Lesson:**

**Introduction**

In this course we will go over how to program in **Java**. This course is meant to go with programming for FRC in Java, and therefore only covers the material required for such programming.

**Integrated Development Environment (IDE)**

For this workshop we will be using Visual Studio Code as our IDE. An IDE is a program where you can write code, run code, and debug code. They often include features that help make the user a more productive programmer such as auto-completion. To install Visual Studio Code follow the link below and complete the steps listed.

Visual Studio Code Installation Guide: <https://wpilib.screenstepslive.com/s/currentCS/m/java/l/1027503-installing-c-and-java-development-tools-for-frc>

**Git**

**Git** is a version control software. This means that it keeps track of different versions of the files kept inside. This allows you to go back to older versions, branch off to allow multiple people to work on the same project at the same time, and store projects online so they can be accessed anywhere. To install Git on your computer follow the link below and follow the instructions.

Git Install: <https://git-scm.com/book/en/v2/Getting-Started-Installing-Git>

**NOTE: If you are on Windows I recommend choosing the GitHub Desktop Client**

**GitHub Classroom**

For this course we will be using GitHub Classroom to provide you with the materials required to complete each worksheet. To sign up for the GitHub Classroom for this class use the link below.

GitHub Classroom Link: <https://classroom.github.com/a/DK8GoKs5>

By using this link you will be added to the classroom and be given the first assignment **repository** (this document is the first assignment).

**How to Properly Complete this Class**

To succeed in learning Java from this course you should complete each assignment in the way described below.

**Step 1: Clone the Git Repository**

To do this go into your Git terminal (on MacOS and Linux this is the Terminal, on Windows this is the GitHub Desktop Client). In the terminal, navigate to the directory where you would like to put your repository. This is done by using the following command:

cd *DIRECTORY-PATH*

The *DIRECTORY-PATH* is the location in your file system where you want to put the repository. How to do this differs depending on which operating system you are using:

MacOS:

Enter the desired folder. Then click on the settings tool (the gear) on the top of the window. Then select “Copy *FolderName* as Pathname.” This copies the location to your clipboard.

Windows:

Click on the folder name near the top and copy the destination path that appears.

Once you are in the correct directory run the command:

git clone *REPOSITORY-URL*

To get the *REPOSITORY-URL* go to your repository on GitHub and click on “Clone or download” and then copy the URL.

If this is the first time you are using Git it will then prompt you to log-in to your GitHub account.

Once this is done you can use the “cd” command to navigate to the repository directory by using the repository name as the *DIRECTORY-PATH*. Inside this directory is where all your projects for the current worksheet should go. Inside the folder you will also find a copy of the worksheet for that assignment, a folder with all the Example projects, and a folder with the Solutions of the Exercises, as well as any other materials provided to complete it.

**Step 2: Read the Worksheet**

Each worksheet is split up into three sections: the Lesson, Examples, and Exercises. You should first read the Lesson. Then go through the Examples. When going through the examples it may be beneficial to try and run them. They are located in the Examples folder in your repository. Finally, read the Exercises and think through how to solve them.

**Step 3: Complete the Exercises**

To complete the exercises, you will need to make new projects for each exercise. To do this, open Visual Studio Code and hit the settings icon (the gear) on the bottom left of the window. Then click on the “Command Palette…” and notice that a search bar pops up. In this bar search for “Java: Create Java Project” and then select it. Finally follow the instructions, making sure to place the project in the repository directory.

**Creating and Running a Project**

Once you have a project you will notice a window on the left. This is you Explorer window, where you can navigate your projects files. Expand the folder “src” and you will see a file inside with a .java extension. This is a Java Class file. It contains some starter code. If you click on the file it will open it. To run the code press F5. This will open up the console and run the code.

**Commit Your Code to Git**

When you are done with your project you should upload it to GitHub. To do this open a terminal window in Visual Studio Code by selecting “Terminal” at the top and then “New Terminal.” This terminal will open on the bottom of the window and is already in your project directory. To update your git repository and add or update your files, follow the list of commands below.

git add -A

git commit -m “*YOUR-COMMIT-MESSAGE*”

git push

*YOUR-COMMIT-MESSAGE* should be replaced with the message you want to put with your current commit.

After doing this, if you go back to your GitHub page online you should see that the repository has been updated to include your new project.

**Step 4: Check your Work**

Once you have completed the exercises you should check your work against the provided Solutions. Your code does not need to match exactly to the solution but it will likely be similar. It is important to not look at the solutions until you have completed the exercise. The goal of this course is to learn Java, not learn how to copy Java code. If you cheat and look at the solution before completing the exercises you are only harming yourself.

**Step 5: Go on to the next Assignment**

The link to the next assignment on GitHub classroom is located at the bottom of each assignment worksheet.

**Step 6: HAVE FUN!**

Remember, Java is a useful tool, not a torture weapon (although it can be made into one). Learning to code in Java with these worksheets is meant to be a fun experience that will let you go on to bigger, better things (like programming Robots) and you need to put in the work to get there. So just remember, go at your own pace, make sure you understand everything before going on, and if you ever need help make sure to ask questions to your peers, mentors, teachers, dog, cat, robot offender, or the always helpful Google.

**Examples:**

Here is an example of a auto-generated class from Visual Studio Code.

**Hello World**

package app;

public class App {

    public static void main(String[] args) throws Exception {

        System.out.println("Hello Java");

    }

}

**Exercises:**

1. Create a new project

**Next Assignment Link:** <https://classroom.github.com/a/Vp-_Aqam>