**WS1 - Intro, Variables and Data types**

The aim of this workshop is to introduce students to the course tools and to explain fundamental concepts such as variables and data types.

**Note for Us:**

*Remember that everything you’re explaining might be completely new for students. What may seem obvious to experienced programmers can be entirely foreign to an undergraduate taking their first steps in computer science. Be clear, patient, and thorough. Break down each concept step-by-step, and encourage questions to ensure everyone follows along.*

**1. Introduction to Course Tools (10 minutes)**

- Briefly explain the three main tools for the course:

- Java - Primary programming language used for development.

- VS Code - Integrated Development Environment (IDE) for writing and compiling code.

- GitHub - Version control platform (to be covered in later workshops).

**2. Setting up Java and Writing the First Program (10 minutes)**

- Explain the difference between **JRE** and **JDK** and why JDK is essential for Java development.

- Guide through downloading and setting up JDK.

- Provide a brief overview of compiling and running Java programs.

**3. Hands-on: Writing a Basic Java Program (20 minutes)**

- Walk students through creating a "Hello World" program in Java:

- Creating a new folder and Java file in VS Code.

- Writing the basic structure of a Java class, including `public static void main`.

- Demonstrate how to compile and run the program in the VS Code terminal.

**4. Introduction to Variables and Data Types (15 minutes)**

- Define variables as data containers and introduce different **data types** in Java:

- \*\*int\*\* (integers), \*\*double\*\* (real numbers), \*\*boolean\*\* (true/false values), \*\*char\*\* (characters), and \*\*String\*\* (text).

- Show examples of declaring and initializing variables in Java.

- Explain camelCase convention for variable naming.

**5. Hands-on Exercise: Understanding Variable Manipulation (10 minutes)**

- Provide a simple example program that demonstrates variable assignments and outputs.

- Discuss how variable reassignment works and clarify misconceptions using example outputs.

**6. Challenge: Swapping Variable Values without Temporary Storage (15 minutes)**

- Present a coding challenge: swapping two integer variables' values without losing data.

- Guide students through the logic of using a temporary variable.

- Display the solution, and encourage students to try it on their own.

**7. Q&A and Recap (5 minutes)**

- Address any questions on topics covered.

- Summarize key takeaways, reinforcing the basics of Java program structure, data types, and variable usage.