Chapter 2 - Java Fundamentals

Chapter 2 provides a complete introduction to Java programming, covering the basic rules, commands, and syntaxes that programmers need before advancing into something more complex. These basics include the parts of a Java program, variables and data types, basic arithmetic operations, as well as the input and output of data.

A basic Java program contains a class, and the name of this class will be the name of the Java file. Inside the Java class, you can find methods, which are sections of code that when executed, can perform specific tasks. The most important method in the class is the main method, which is basically the ‘control centre’ of a program. In ProgramOneCTwo.java, the program contains the class named ProgramOneCTwo, as well as the main method that contains instructions. The main method executes these instructions when the program is run.

A Java program can also store and manipulate data. Data can be stored into variables and can be accessed or manipulated depending on the task’s instructions. These variables need to be declared beforehand and can be assigned values, as shown in the ProgramTwoCTwo.java file. Note that the data type needs to match the variable type. If an integer variable is declared, the variable can only contain an integer, not a string or boolean. The following are some important data types.

Name	Meaning	Example
String	Stores a set of alphanumeric characters and symbols	“Helloworld 1234”
Integer	Stores integer values	16
Double	Stores numbers with decimals	97.5
Boolean	Stores true or false	true

These variables can also be accessed and manipulated. However, it is essential to know that variables can only hold one value at a time. For example, in ProgramTwoCTwo.java, the variable ‘number’ initially contained the value 16, but after some calculations, the number now becomes 7. This is achieved through arithmetic operations. The basic arithmetic operations learned in mathematics apply in Java as well.

Symbol	Name	Function
+	Addition	Adds things together
-	Subtraction	Subtracts things from each other
*	Multiplication	Multiply things together
/	Division	Divides things from each other
%	Modulus	Finds remainder of a division

Java programs can also obtain input and produce output. ProgramThreeCTwo.java provides an example of how to receive input and produce output. To obtain input, we need to use a Scanner class, which can be achieved by importing the Scanner class. After that, a Scanner object needs to be created in order to read the input, along with some Java commands that serve the purpose of reading the data typed in from the user’s keyboard to be used for input. After the data is read, it is usually stored in a variable. Producing an output uses the Java command *System.out.print();*, and when this command is executed, the program produces an output that can be read by the user, depending on the instructions.