**Exercise 1**

**3.10 Compare and contrast the if single-selection statement and the while repetition statement.**

* **Similarities:**
  + Both use a condition to determine whether to execute a block of code.
  + Both can alter the flow of execution in a program.
* **Differences:**
  + if is a **single-selection statement**; it executes a block of code **once** if the condition is true.
  + while is a **repetition statement**; it continues executing a block of code **as long as** the condition remains true.

**3.11 What happens when a Java program divides one integer by another?**

* In Java, dividing one integer by another using / results in **integer division** (the fractional part is discarded).

**3.12 Describe the two ways in which control statements can be combined.**

1. **Sequential execution:** One statement follows another in sequence.
2. **Control structures combination:**
   * **Selection (if, if-else, switch)** for decision-making.
   * **Repetition (while, for, do-while)** for loops.

**3.13 Which type of repetition is appropriate?**

* **Sum of first 100 positive integers:** A **counter-controlled** for loop is best:
* **Sum of an arbitrary number of positive integers:** A **sentinel-controlled** while loop is appropriate:

**3.14 Difference between preincrement and postincrement**

* **Preincrement (++x)**: Increments x **before** using its value.
* **Postincrement (x++)**: Uses the current value of x **before** incrementing.

**3.15 Identify and correct errors in the code**

* **(a) Incorrect semicolon and mismatched quotes**
* **(b) Variable total is not initialized**
* **(c) Missing braces ({})**
* **(d) Infinite loop (y keeps increasing)**