Exercise 2 Introduction to Java programming

Topics

- Introduction to Java programming
  - Java Program Structure
  - Primitive types
  - Input/output data

Exercise 2.1

Write a program that reads a real value that represents a distance in kilometers, converts the distance to miles, and prints the result. The conversion formula is:

Miles = Kilometers / 1,609.

Exercise 2.2

Write a program that reads a real value that represents a temperature in degrees Celsius, converts the value to degrees Fahrenheit, and prints the result. The conversion formula is:

$$F = 1.8 * C + 32.$$

Exercise 2.3

Write a program that calculates the energy needed to heat water from an initial temperature to an end temperature. The program should read the amount of water M (in kilograms), and the initial and the final water temperatures (in degrees Celsius). The formula for calculating the energy Q (in Joules) is given by:

Q = M * (finalTemperature - initialTemperature) * 4184.

Exercise 2.4

An investment fund provides a fixed monthly interest rate, which accumulates with the previous balance of the investment (interest on interest). Write a Java program that asks the user for the amount invested and the monthly interest rate. What is the total amount at the end of 3 months? *(For example, for an investment of 5000 euros and a rate of 1% the amount after 3 months will be 5151,505 euros).*

Exercise 2.5

We intended to calculate the average transport speed from point A to point B, the trip is made in two stages, and each stage can have a different length. Write a program that asks you to enter the speed (v1) and distance (d1) traveled on the first route, as well as the speed (v2) and distance (d2) traveled on the second route. Based on these values, the program should calculate and print the final average speed.

Exercise 2.6

Write a program that for a time in seconds read from the keyboard, shows the time in the console in the format hh:mm:ss.

Tip: To calculate the remainder of the division, you can use the % operator.

Exercise 2.7

Write a Java program that represents two points, p1 and p2, asking the user to enter their real x and y coordinates. Calculate and print the distance between the points.
Tip: to calculate the square root you can use the Math.sqrt function (include import java.lang.Math).

Exercise 2.8

Given a right-angled triangle of sides A and B and hypotenuse C, write a program that reads the value of the sides and determines the value of the hypotenuse, and the angle value (in degrees) between side A and the hypotenuse.