

## Assignment 1

1. (1) Write a Java program that prints all the pairs of **amicable numbers** less than n. In number theory, two numbers form a pair of amicable numbers if the sum of the proper divisors of each one equals the other. For example, 220 and 284 are amicable, because proper divisors of 220 are: 1, 2, 4, 5, 10, 11, 20, 22, 44, 55, 110 and their sum is 284; and proper divisors of 284 are: 1, 2, 4, 71, 142 and their sum is 220. The first five amicable pairs are: (220, 284), (1184, 1210), (2620, 2924), (5020, 5564), (6232, 6368).
2. (1) Write a Java program that prints the number of words in a string that start with the specific letter **begin** and ends with the specific letter **end** (it is not important if the letters are lowercase or uppercase). The string and two letters are entered from the standard input.
3. (2) Create an abstract class **Shape** with abstract methods `getPerimeter()`, `getArea()`, `printNameShape()` and `print()`. Next, create a classe **Triangle** that extends the class Shape. Finally, create a class **TriangularPrism** that extends Triangle.

The class Triangle has 3 private attributes a, b, and c, a constructor with arguments and no-arguments constructor with default value of 1 for all the attributes, set and get methods for the attributes, and it implements all the abstract methods from the Shape class, where the `print()` method prints the following:

"Triangle with sides \_\_, \_\_, and \_\_, has a perimeter L=\_\_ and an area P=\_\_\_."

The class TriangularPrism has one more private attribute height; constructor with arguments and no-arguments constructor with default value of 1 for the attributes; set and get methods for the additional attribute; methods `getArea()` and `getVolume()` that return area and volume of the TriangularPrism, method `printNameShape()`, and method `print()` that prints info about the triangular prism in the following way: "Triangular prism with a base with sides a= \_\_, b=\_\_ and c=\_\_, and a height \_\_, has an area P =\_\_ and a volume V=\_\_\_."

- a) Create a class Test for testing classes Triangle and TriangularPrism.
- b) Create a class Test2 in which an array of 10 triangular prisms is created, and the triangular prism with the smallest volume is printed.