



1. Create a class with a private constructor. What will happen if you instantiate the class within a main method if (a) main is in the same class, and (b) main is in another class.

2. What is the result of the next sequence, where Engine is a class defined next.

```
Engine e1, e2;  
e1 = new Engine(5);  
e2 = e1;  
e2.setCapacity(10);  
e1.print();
```



```
class Engine {  
    private int capacity;  
  
    public Engine(int c) {  
        capacity = c;  
    }  
  
    public void setCapacity(int c) {  
        capacity = c;  
    }  
  
    public void print() {  
        System.out.println("My capacity is " + capacity);  
    }  
}
```



3. Define a class Complex useful for modeling complex numbers. The members of this class are:

- two double attributes (re, im) for storing the real part, as well as the imaginary part of a complex number
- one constructor for initializing the two double values
- a method for computing the module of a complex number (use the static method sqrt(double) from the Math class for computing the positive square root of a double value)
- a method for printing the value of the complex number (re + i * im)
- a method for computing the sum between two complex numbers, the result being a new complex number
- a method for counting and returning for how many times complex numbers have been printed

Create a class ClientComplex with a main method where some complex numbers are instantiated and all the existing services provided by these objects are called.



4. A class call Book is characterized by the number of pages its instances contains. We consider that two books are equal if both of them have the same number of pages. Define the class Book that contains a suitable method for comparing two books. Call the mentioned method from a main method.

5. A square is characterized by its side. Define a class Square that has two constructors, one for initializing the side of the square as being 20 and one for initializing the side of the square with a given value as an int parameter. Create a suitable method for printing a square as "Square" side "area" area, where area = side * side
Instantiate within a main method different square objects and print them.



6. Create a class Pyramid that is printed as it follows

1 1 1 1

2 2 2

3 3

4

For the mentioned case, 4 is the value of a parameter that is given when the printed object having the Pyramid type is instantiated.



7. Create a class Sum with the next methods:

//returns the sum between a and b

a) public static int sum(int a, int b) ...

//returns the sum between a, b and c

b) public static int sum(int a, int b, int c) ...

//returns the sum between a, b, c and d

c) public static int sum(int a, int b, int c, int d)

Each method will contain only one addition operator!