Programming I. Introduction to OOP

Lab #7

Notes

Folder organization for solutions on the student's account:

```
Z:\
|
|--Programming01
|----Lab01Problem01
|----Lab01Problem02
|----…
|----Lab02Problem01
|----…
|--Programming02
```

Topics: methods, procedural decomposition, simple usage of exceptions

Task #1: "Which coordinate is closer" (0.5%)

In this task, students have to write a program that asks user's coordinate (integer number) and coordinates of two points (two integer numbers). The program has to find which of these points is closer to the user. In this program students have to implement method int abs(int x) to solve this task;

```
Your coordinate: 23
Coordinate of 1st point: 1
Coordinate of 2nd point: 25
2st point is closer. Distance 2
```

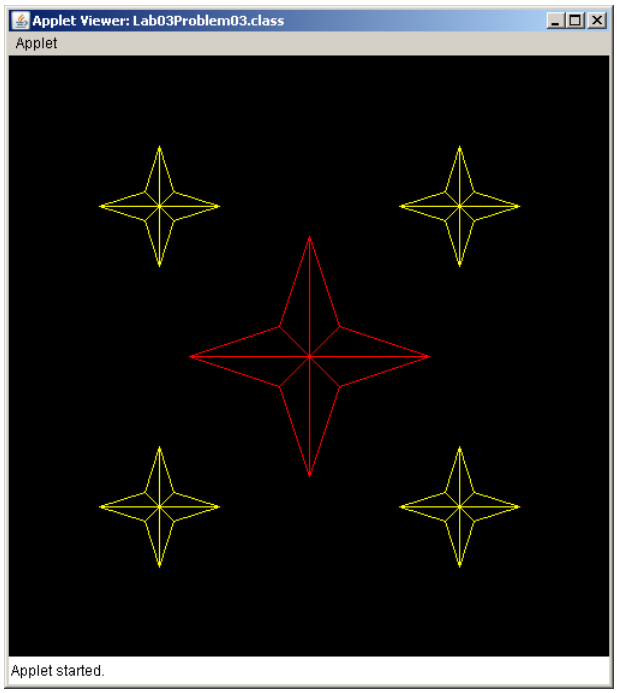
Task #2: Number of days in month (0.5%)

Write a program that gets number of month and year and prints the number of days in this month. Implement methods int getDaysOfMonth(int year, int month) and boolean isLeapYear(int year) to solve this problem.

```
Year: 2004
Month: 2
Number of days: 29
```

Task #3: "Stars" (0.5%)

Write a GUI program that creates this picture. In this program you have to define method void drawStar(Graphics g, int x, int y, int r, Color color) and use this method to draw 5 stars.



Task #4: Greatest Common Divisor. Slow version (0.5%)

Write a program that takes two arbitrary integer numbers and prints their greatest common divisor. It's necessary to define method int gcd(int a, b) in this program. This method returns greatest common divisor of numbers a and b. If it is impossible to find your method has to throw IllegalArgumentException exception and your main method has to catch this exception and print some appropriate message. Use for method gcd the simplest algorithm.

```
A = 25
B = 10
GCD(25, 10) = 5
```

```
A = 0
B = 0
GCD(0, 0) is not defined.
```

Task #5: Greatest Common Divisor. Euclid's algorithm (0.5%)

Solve Task #4 using Euclid's algorithm.

Home Reading: Liang Introduction to Java Programming 8th ed. Chapter 5.