Lab 5.3.9 Points in 2D: part 2

Objectives

Familiarize the student with:

- modelling real-world entities with classes and objects;
- interactions between objects of the same type;
- creating objects based on objects of other objects of custom classes.

Scenario

A line in two-dimensional space can be represented by two parameters, the slope and the y-intercept.

If we represent the slope as a and the y-intercept as b, then all points that belong to that line can be expressed by the equation $y = ax + b$.

Knowing two points that belong to a line, we are able to calculate the slope and the y-intercept of the line.

Your program should read two sets of x and y coordinates and construct an object of the class Line2D, based on those two points.

Output the line in the form "y = [slope]x [+-] [y_intercept]

```cpp
#include <iostream>

using namespace std;

class Point2D{
public:
  Point2D(double x, double y);
  string toString();
  // ...
private:
  double x;
  double y;
};

class Line2D{
public:
  Line2D(double slope, double y_intercept);
  Line2D(Point2D pointA, Point2D pointB);
  string toString();
  // ...
private:
  double slope;
  double y_intercept;
};

// implement Point2D and Line2D methods
```

Example input

```
0 0
3 6
```

Example output

```
y = 2x + 0
```

Example input

```
2 2
-2 0
```

Example output

```
y = 0.5x + 1
```

Example input

```
-1 1
2 -4
```

Example output

```
y = -2x - 1
```