Programming Test - Pattern Recognition

Pattern Recognition

Computer vision involves analyzing patterns in visual images and reconstructing the real world objects that produced them. The process in often broken up into two phases: feature detection and pattern recognition. Feature detection involves selecting important features of the image; pattern recognition involves discovering patterns in the features. We will investigate a particularly clean pattern recognition problem involving points and line segments. This kind of pattern recognition arises in many other applications, for example statistical data analysis.

Problem to solve

Given a set of N feature points in the plane, determine every line that contains N or more of the points, and return all points involved. You should also expose a REST API that will allow the caller to:

- Add a point to the space

```
POST /point with body { "x": ..., "y": ... }
```

- Get all points in the space

```
GET /space
```

- Get all line segments passing through at least N points. Note that a line segment should be a set of points.

```
GET /lines/{n}
```

- Remove all points from the space

```
DELETE /space
```

Additional rules

- All code should be under version control, on a publicly accessible git repository (e.g., a GitHub repository);
- Unless specified in the instructions above, the API should consume and produce JSON;
- The languages you can choose to implement are: Java, Kotlin, JavaScript. Other web/JVM based

languages could be taken into consideration.

Suggestions

- Properly naming variables and documenting the code can help us understand your solution;
- Validating all inputs to your program will help your solution pass our test cases;
- There is no bound on the computational complexity of the solution, but solutions with good computational complexity will earn you bonus points.