

Genetic Algorithm :

The screenshot shows an IDE interface with a project structure on the left and a code editor on the right. The project structure includes a .idea folder, a src folder containing main, com.university.routing, algorithms, Map, models, org.example, and resources. The main.java file is open in the editor. The TSPGeneticSolver class is highlighted with a red oval. The code editor shows the following Java code:

```
7 2 usages
8 public class TSPGeneticSolver {
9     // Параметры ГА
10    3 usages
11    private static final int POPULATION_SIZE = 100;
12    1 usage
13    private static final int GENERATIONS = 1000;
14    1 usage
15    private static final double MUTATION_RATE = 0.02;
16    1 usage
17    private static final int SELECTION_SIZE = POPULATION_SIZE / 2; // Размер отобранной популяции
18
19    1 usage
20    public static List<String> solveTSP(Graph graph, List<String> points) {
21        List<List<String>> population = initializePopulation(points);
22        Random random = new Random();
23
24        for (int generation = 0; generation < GENERATIONS; generation++) {
25            // Оценка приспособленности
26            Map<List<String>, Integer> fitnessMap = evaluateFitness(graph, population);
27
28            // Селекция
29            List<List<String>> populationRoutes = new ArrayList<>(population);
30            List<List<String>> selectedPopulation = selectPopulation(populationRoutes, SELECTION_SIZE);
```