# Size of data

Size of data has influence on results. Percentage of final solution differs a lot. For example if there are 100 points and line which is found has 98 points distributed correctly(i.e. above or beyond) it would be 98% of accuracy, for 10 points and 9 correct it would be 90% of accuracy and etc. The biggest difference is shown when amount of border points is different. If “border” is tight - it is hard to find perfect solution, but if the amount of point is the same but border points are distributed in different manner. 100% solution could be found easily.

For test the same algorithm was run 10 times. Each for the set of points which contains 47 points and 100 lines. Algorithm is doing 100 generations, has mutation variance equal to 50% and crossover is distributed randomly.

For set of point on the second graph it took algorithm in average 8 generations to find 100% solutions and for the first graph, where border is narrow, it took in average 12 generations to find 97% solutions and only 1 of the solutions was 100%.

The same situation will appear for polynomial of higher degreases.

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All other tests I will do using 3rd degree polynomial because it is middle representation of complexity of algorithms

# Population size

## 10 lines in start population:

Average generation of solution: 16, Average percent of solution: 92 %, Best result 93 %

## 50 lines in start population:

Average generation of solution: 31, Average percent of solution: 97 %, Best result 100 %

## 100 lines in start population:

Average generation of solution: 30, Average percent of solution: 98 %, Best result 100 %

On the diagram graph with percentage 100 % is presented.

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# Amount of generations

## 10 generations:

Average generation of solution: 5, Average percent of solution: 94 %, Best result 96 %

## 50 generations:

Average generation of solution: 27, Average percent of solution: 97 %, Best result 100 %

## 100 generations:

Average generation of solution: 45, Average percent of solution: 98 %, Best result 100 %

## 300 generations:

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| 10 generations | 50 generations |
| 100 generations |  |