The initial parameters we used in the genetic algorithm are as follows:

- *elitism = 2*
- *mutation rate = 0.1*
- *number of generations = 200*
- *population size = 50*
- *max no improve = 20*

The solutions we obtained with these parameters were good, and the execution time of the algorithm was satisfactory. It often happened that the algorithm finished before reaching the specified number of generations.

Number of blocks	Time
100	~10s
300	~40s
500	~2m 15s
1000	~7m 15s

After that, we increased the **mutation rate** to 0.5 and obtained worse solutions, as well as longer execution times, since the program ran for the full number of generations each time. The reason for this is the increased number of mutations, which generated new offspring whose heights were not present in the **fitness_cache** array. As a result, the **calculate_height** function was called much more frequently, which slowed down the program.

Number of blocks	Time
100	~35s
300	~3m 50s
500	~5m
1000	~13m

The next parameter we changed was the **population size**, which we reduced to 20. The execution time improved significantly, but the solutions became somewhat worse. Still acceptable, however, considering the performance gain we achieved.

Number of blocks	Time
100	~4
300	~10
500	~20
1000	~1m 40s

The next parameter we adjusted was the **number of generations**, which we reduced to the square root of the number of blocks being processed. The execution speed was very good, but the solutions were noticeably worse.

Number of blocks	Time
100	~4s
300	~20s
500	~45s
1000	~2m

The last parameter we tested was **elitism**, which we increased to 7. The solutions were neither worse nor better compared to the initial parameters, and the execution time remained about the same for smaller numbers of blocks. However, when dealing with a larger number of blocks, in our case 1000, the situation changed. A noticeable improvement in speed was observed, resulting in the program finishing almost a full minute faster.

Number of blocks	Time
100	~12s
300	~35s
500	~2m 15s
1000	~6m 30s