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Introduction to Artificial Intelligence

Laboratory 1 Report

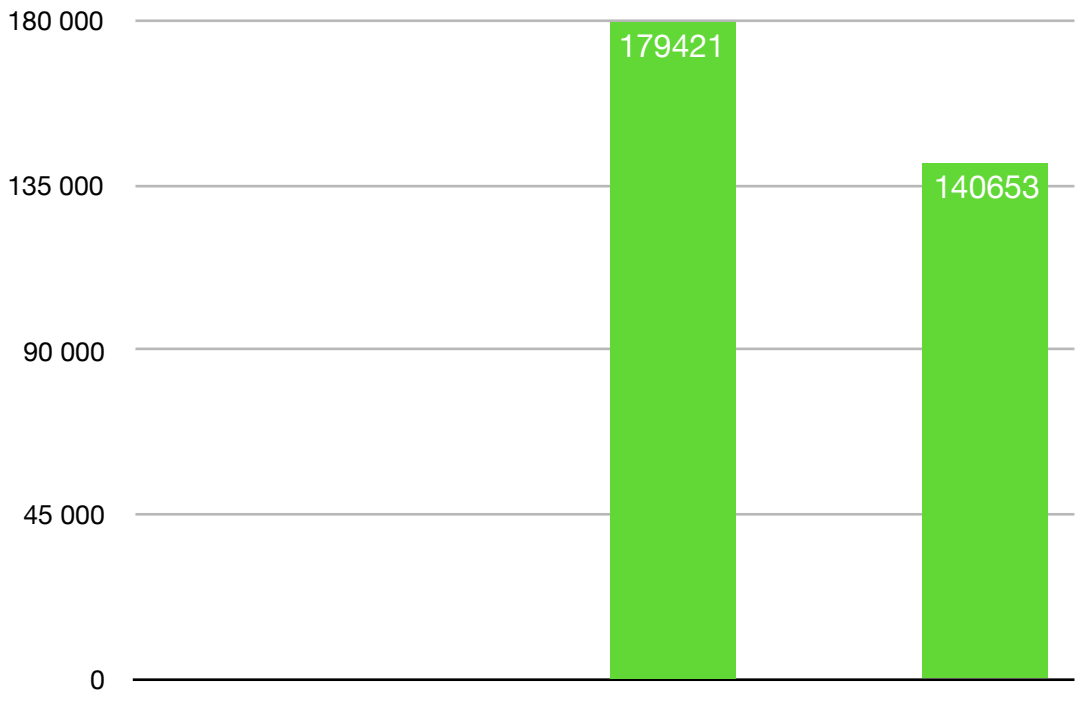
How to:

In order to run the code please execute: python init.py “output.csv”, to generate new set of data: python generate.py n W S “name.csv”

Analysis answers:

9. Crossover probability

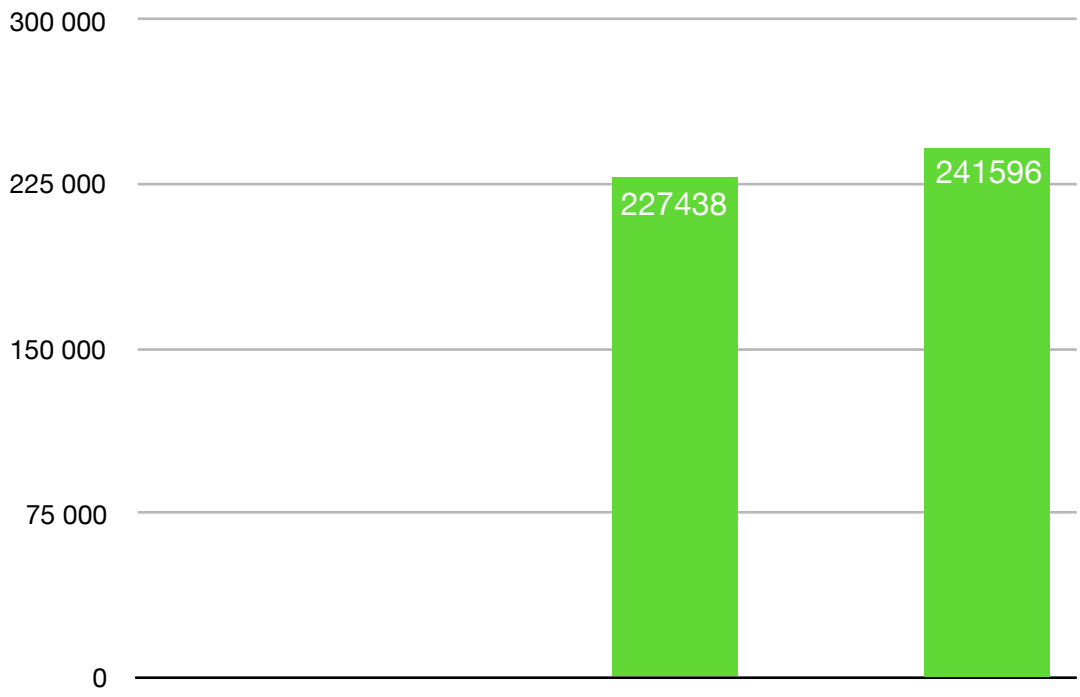
for the following values: 0.1, 0.5, 0.8 I got the following results:



So 50% for crossover turns out to be the best which sounds reasonable considering the fact that we are combining two best individuals of certain tournaments so it has mathematical chances to get the best of both. For low value it turned out to be zero which is surprising but the small difference between 0.5 and 0.8 does not surprise me.

10. Mutation probability

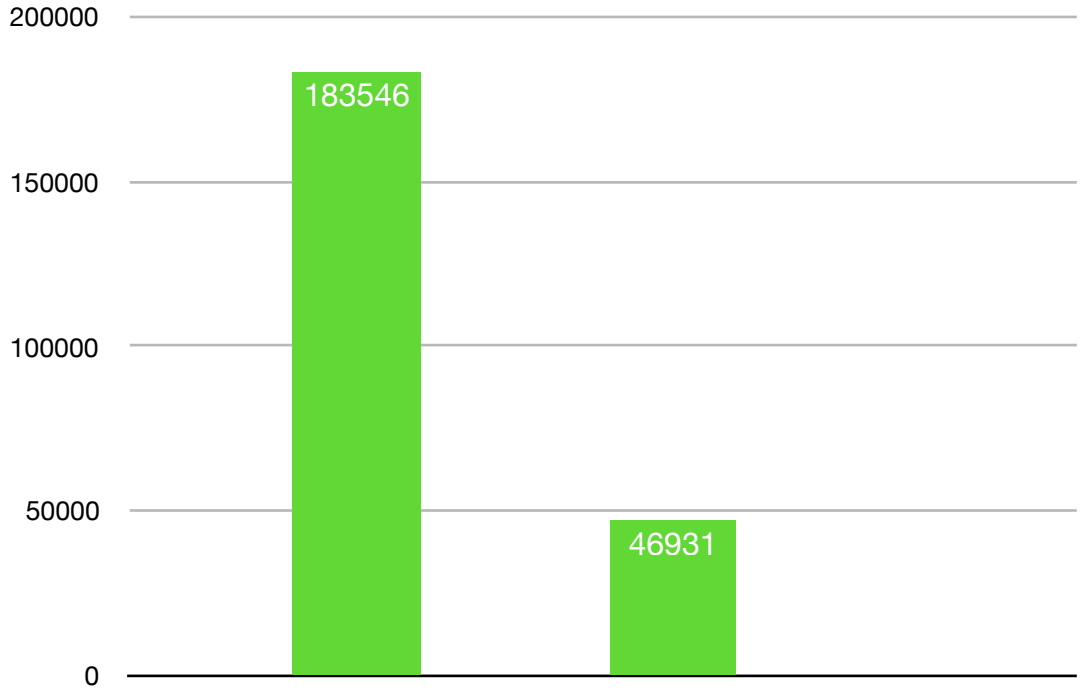
for the following values: 0.1, 0.03, 0.01, I got the following results:



When it comes to mutation, the answer seems simple - the smaller the better at least to extend I have checked. Although the difference between two last ones is marginal comparing to change in value which is 3 times different therefore it seems like its slowly reaching maximum performance at this point.

11. Tournament size

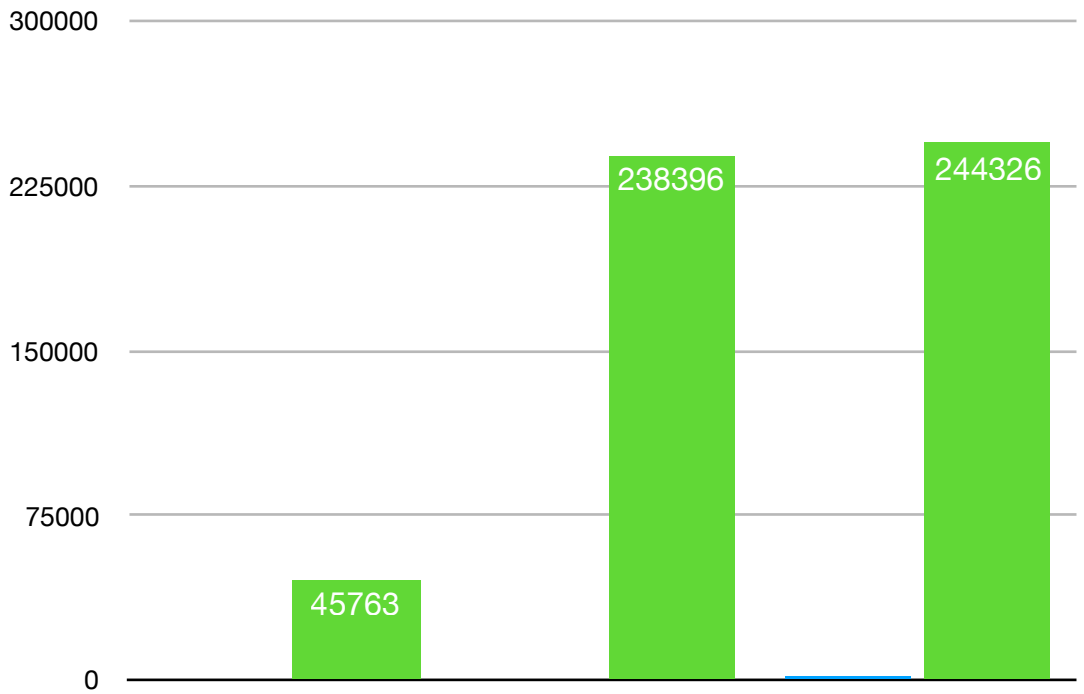
for the following values: 2, 10, 50 I got the following results:



The smallest one appeared to work the best and with bigger values the results got smaller and smaller. Considering the fact that overall population size was set to 100, the last result doesn't surprise me as there was a huge chance for overlap since the tournaments are run separately on the same population and same logic we could apply for middle one.

12. Population size

for the following values: 100, 1000, 2000, I got the following results:



The population is perhaps the most powerful parameter since it gives more combinations to work with since the very beginning. The bigger the better but similar to mutation probability doubling the value did little change to the results implying that it close to the most optimal value.

During the tests only one parameter at time was changed the rest was running on default settings which can be found in code.