Task 1 and 2

Link

Link to github

Important remark

My Euclidian distance is somehow calculated wrongly, since I am not using the implemenation from the library, but my own. This is why I am getting longer distances, but the solution-path seems to be right.

Task 3

1.)

I get better values with a higher β value. Especially from the very beginning as well. If β is smaller I get very high distances at the beginning, but they get better with time. This is making sense to me, since a higher β value makes a smaller distance (1/d) multiplied by itself, which is for a smaller value significantly better. This is why the shorter distances are picked first and therefore getting "better" results more quickly. For α the best value I can use is 1. Values which are higher or lower lead to worse result. The α value is responsible for the pheremone importance. It is interesting that there is a "best" value in the middle. This means, that the pheromene trails in the beginning can be misleading if the randomization at the beginning is bad.

2.)

Both high and low ρ values lead to good results. This is interesting and I can interpret, that the value for initialization does not work that well for me, although I took it from the books. The ρ value is responsible for the evaporation. This also means that the shortest paths in the beginning are helping even if the system reacts slower (when pheronome evaporation is low).

3.)

I would change my run-function where I get to chose the next location and the while loop I use there. I would just limit those numbers to a fixed amount (maybe 30 cities) instead of taking all possible remaining cities and chose the best location from there. The evaluation function would then choose the best out of those. Also I would need to adjust the while-loop to know when to end, but this could be fixed easily as well. The only problem left I see at the moment and at this time of the night is the evaluation. It will be hard to compare against other results with more or less cities in it. One thing that might be interesting to adjust the α and β values if changes are coming in.