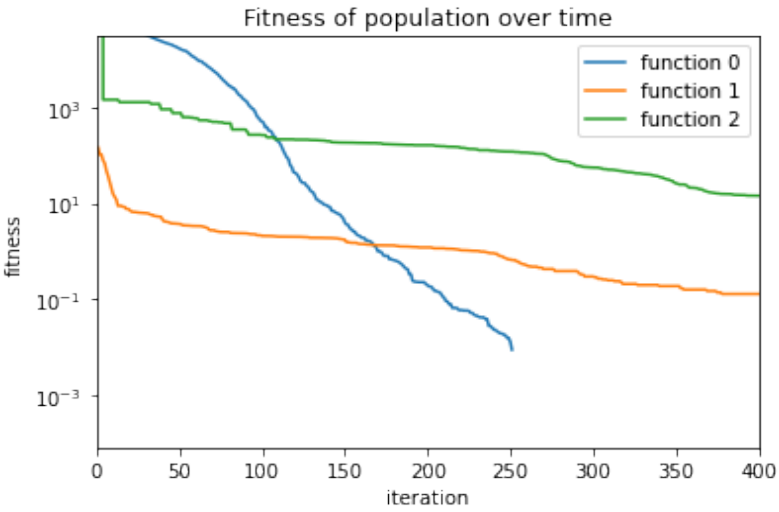
Particle Swarm Optimization

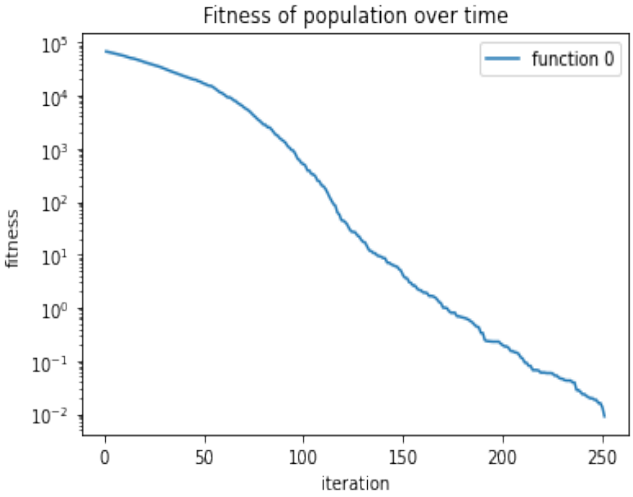
python pso_v2.py // enter all values, check out the plots! 2D, 3D and multidimensional!

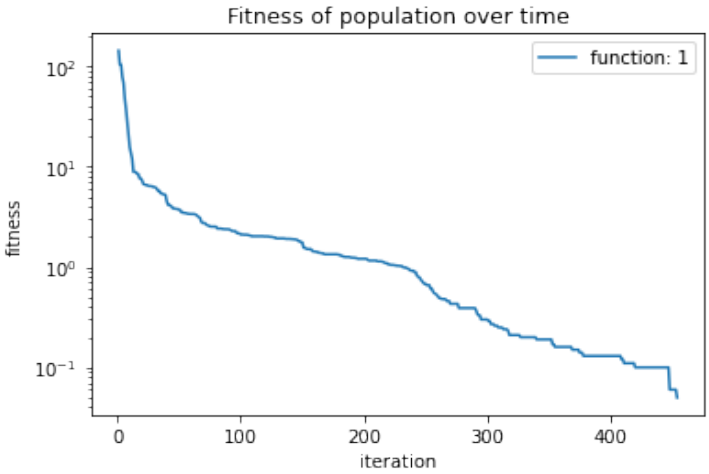
// use plot with reasonable numbers (dim<30)



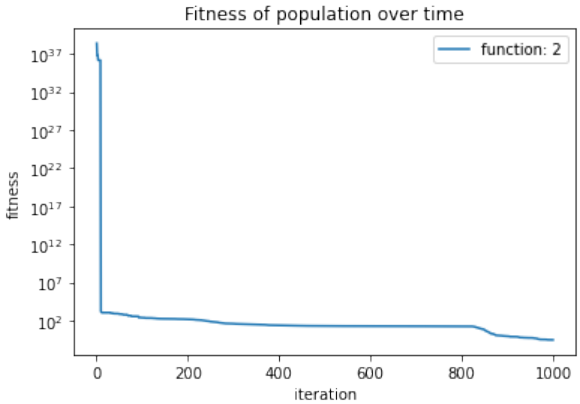
Population Size = 95, Dimension 30, Precision between 0.01 and 0.05

Nice optimization curve for function 1 and 2



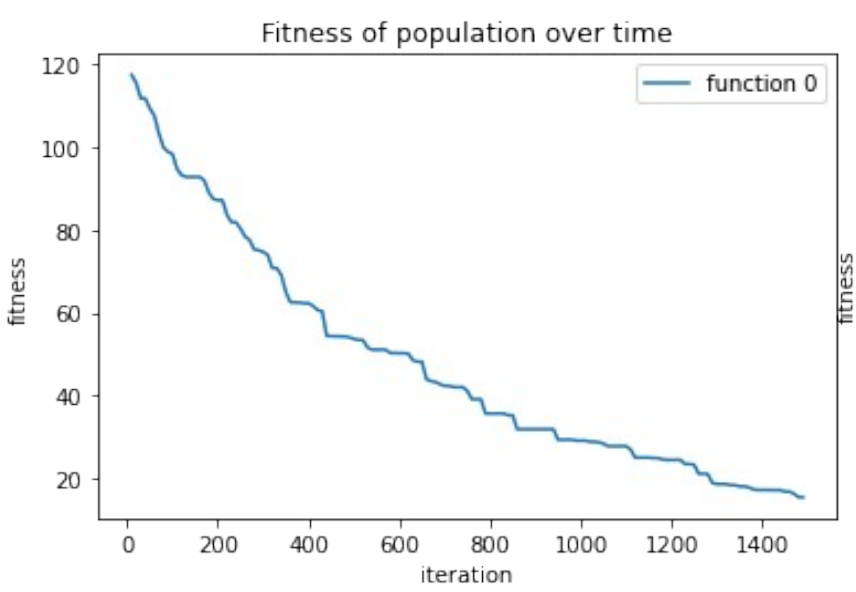


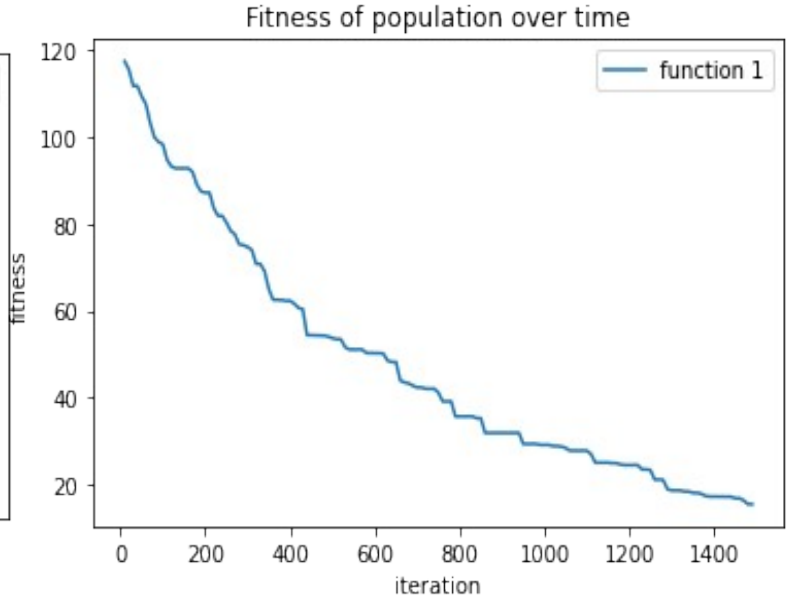
Function 2 had a really bad start position.

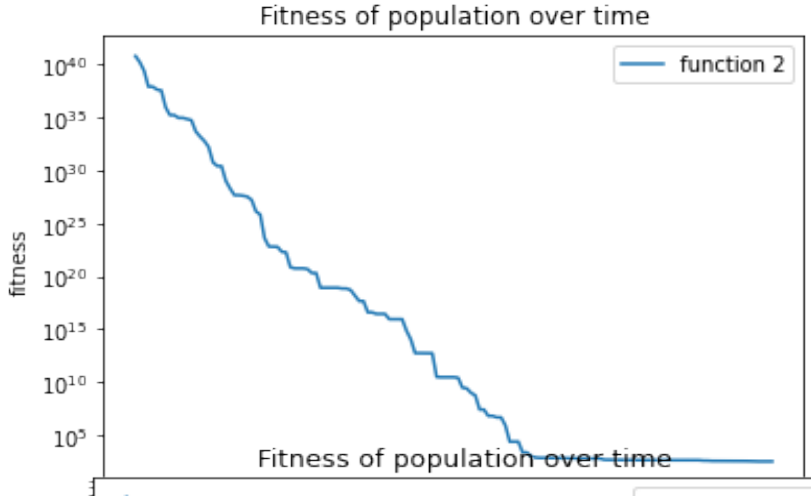


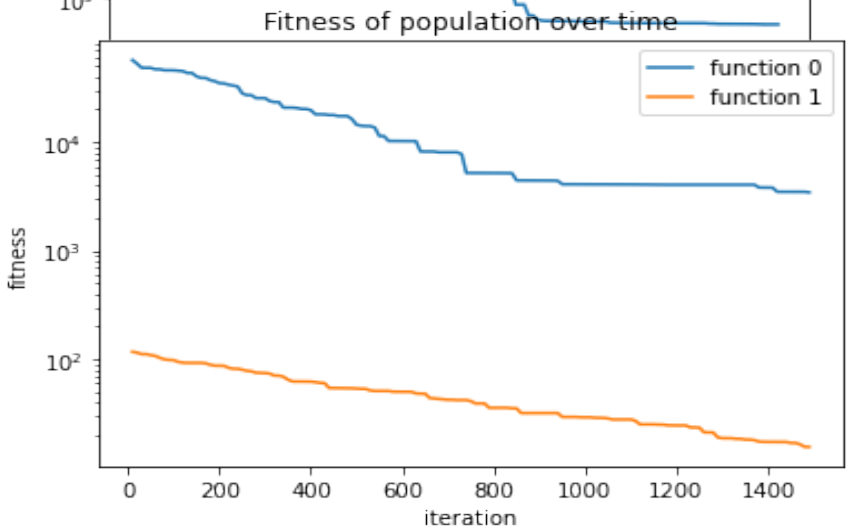
Artificial Bee Colony
python abc.py // enter all values, check out the plots! 2D, 3D and multidimensional!
// use plot with reasonable numbers (dim<30)
Population Size = 95, Dimension 30, Precision between 0.01 and 0.05

All functions have nice optimization curves,
however ABC is WAY MORE time consuming than PSO, factor 10-20?





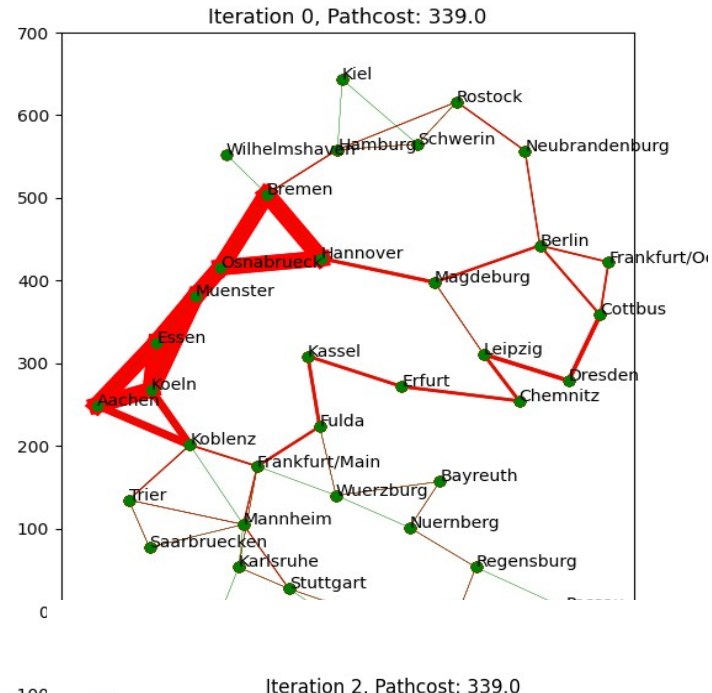


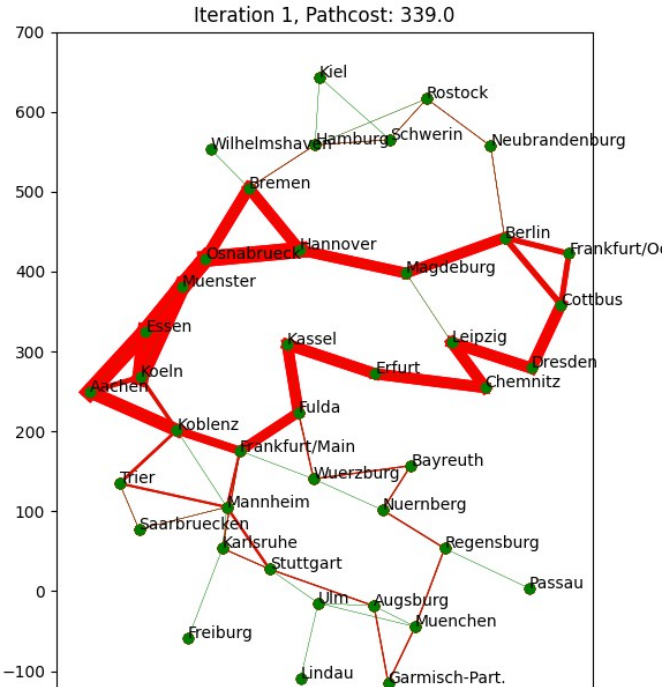


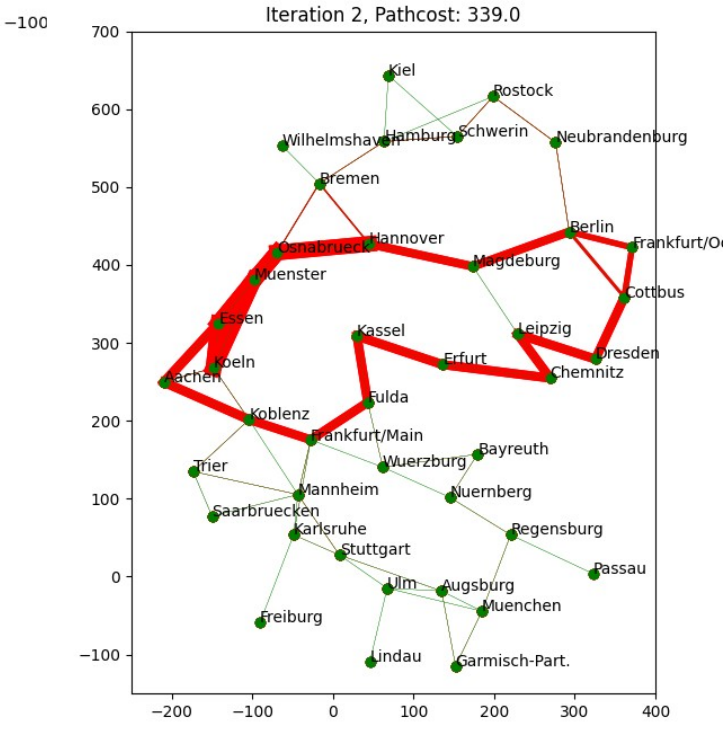
Ant Colony Optimization
python aco.py // be sure to run it, really nice animation!

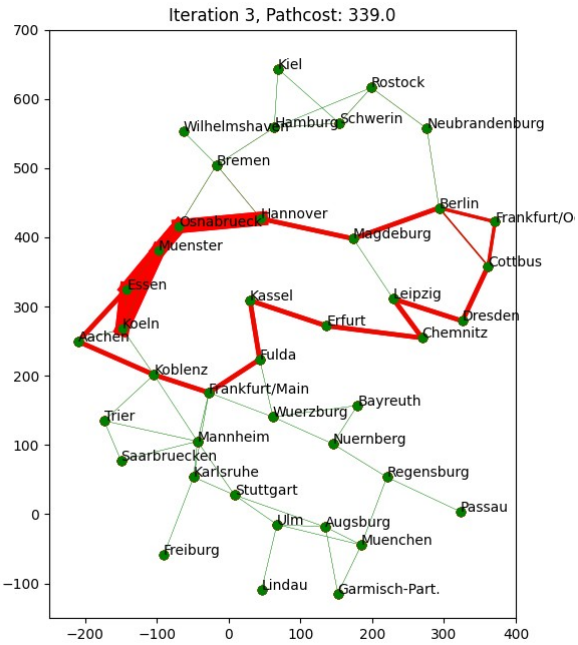
```
n_ants = 100
n_iter = 50
decay = 0.1
alpha = 2
beta = 1
```

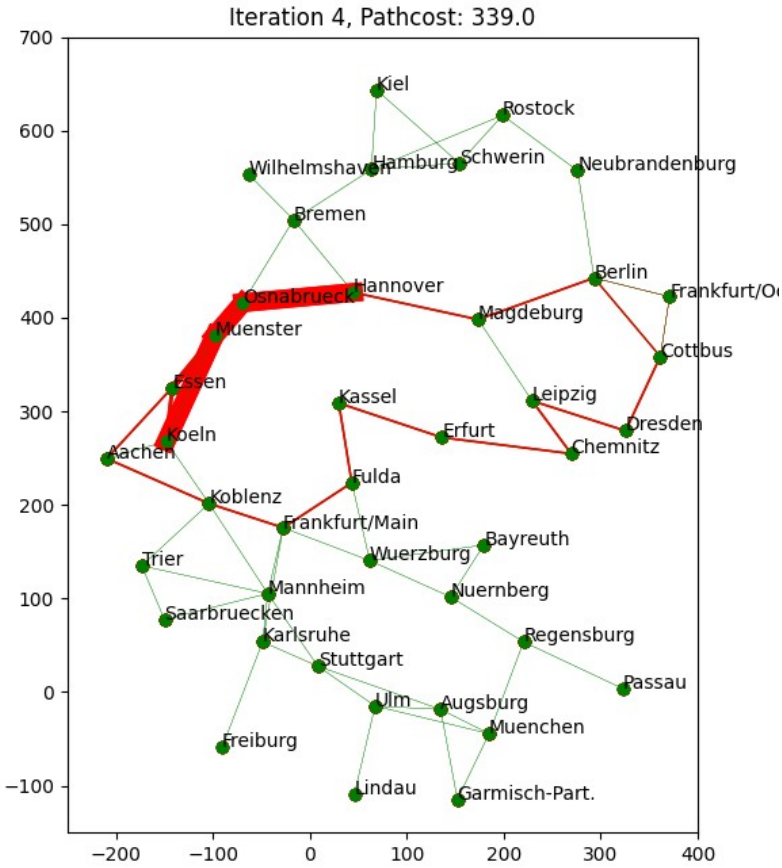
In my script I use the distances of citys in germany
Images: Koeln → Hannover

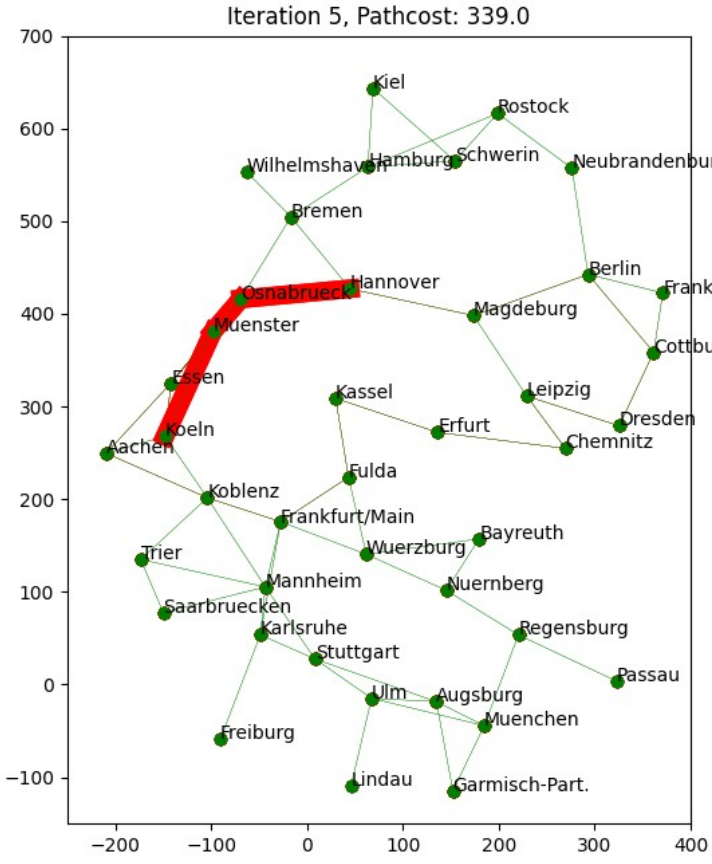












As you can see, the ant start by exploring in random directions but after the first iteration you can already see prefered paths to the goal.
With further iterations the less optimal paths get pruned really quickly and the ant colony follows one way.