Organic Computing 2

Lösungsvorschlag Blatt02

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Aufgabe 01

- β: determines importance between pheromones and distance when selecting next city (float)
- q_0: tradeoff between exploration and exploitation (float)
- α: pheromone-decay during global update step (float)
- ρ: pheromone-decay during local update step (float)
- τ_0: determines starting values of 'pheromone-paths', is also used during local update (float)
- m: number of ants (int)

- γ: discount value $\in [0, 1]$, is also used in reinforcement learning

- τ_0: the authors recommend $(n * L_{nn})^{-1}$, where L_{nn} is produced by a nearest neighbour heuristic and n is the number of cities
- we used a very rough approximation with $(n * 500)^{-1}$
- complexity: $O(n^2)$

Evaluation

- Intel® Core™ i5-5257U CPU @ 2.70GHz × 4, 8GB Ram
- n=10: 1.82 seconds, ants=10, iter=400 $\Rightarrow$ Routes=4000
- n=20: 6.6 seconds, ants=15, iter=400 $\Rightarrow$ Routes=6000
- n=30: 20 seconds, ants=20, iter=500 $\Rightarrow$ Routes=10000

seed	1	2	3	4	5
sec	1.83	1.79	1.81	1.77	1.83

seed	6	7	8	9	10
sec	1.80	1.86	1.85	1.85	1.77

seed	1	2	3	4	5
sec	6.79	6.43	6.58	6.43	6.81

seed	6	7	8	9	10
sec	6.52	6.48	6.50	6.79	6.66

seed	1	2	3	4	5
sec	20.51	19.58	20.28	20.21	19.12

seed	6	7	8	9	10
sec	19.15	20.02	19.41	19.13	18.92