Assignment on Ant Colony Optimisation solve the traveling salesman problem using an AntSystem

Find the shortest tour around the following list of cities (data from the files `vertices.txt` and `edges.txt` from Dijstra exercise):

```
AW Aberystwyth
BG Brighton
BK Birkenhead
BR Bristol
CH Cheltenham
CL Carlisle
CM Cambridge
CN Carmarthen
CO Coventry
DO Dover
ED Edinburgh
EX Exeter
FO Folkestone
FW Fort-William
GW Glasgow
```

In the Ant System, m ants travel from a random starting point from city to city until all n cities have been visited. Hereby, paths are chosen randomly with a probability which is a function of the amount of pheromones already deposited and of the distance to the next city. The probability for an ant k at city i to go to city j, is given by

$$p_{ij}^k(t) = \frac{Q_{ij}}{\sum_{l \in J_i^k} Q_{il}} \qquad \text{with } j \in J_i^k,$$

which is the feasible neighborhood for ant k in city i and Q_{ij} a combined metric of the quality of the route. In the Ant System, the quality of a route ij is a function of the pheromones already deposited by other ants given by τ_{ij}, and a heuristic $\eta_{ij} = \frac{1}{d_{ij}}$, with d_{ij} the distance between city i and city j. Thus, Q_{ij} is defined as $Q_{ij} = [\tau_{ij}]^\alpha [\eta_{ij}]^\beta$ with α and β allowing us to fine tune the impact of pheromones and heuristic information on the metric.

After completion of a tour, i.e. arriving at the starting city, ants assess the tour, and deposit an amount of pheromones that is inverse proportional to the tour length on k every link ij they visited, i.e. $\triangle\tau_{ij} = \frac{1}{C^k}$ with C^k the total length of the tour of ant k.