CS6380

Assignment 1

Travelling salesman problem

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Approaches:

1) **Nearest neighbour heuristic**:
   Easy to implement and giving good results in many cases.
2) **Simulated aneling** :
   Since the Nearest neighbour heuristic runs only for some time we cannot utilise the complete 5 min time. So I decided to use Simulated aneling as it utilises all the existing time and tries to get better with time.
3) **Nearest neighbour heuristic + Simulated aneling :**
   For simulated annealing, a good starting point results in a good solution so I decided to used the solution of the Nearest neighbour algorithm as the starting point to simulated aneling. And now optimising simulated aneling is a task how to chose T is a Question I tried these approaches for choosing T.
   a) **T = remaining time:**
      I used this approach so that we can run simulated aneling full time and speed up the algorithm at the end and explore more at the start.
   b) **T = function of no.of iterations:**
      The main drawback of the last approach is T goes linear with time so I decided to make it exponential so I initialised T with a large value and multiplied it with a small value every iteration.
4) **Nearest neighbour heuristic + Repeated Simulated aneling :**
   The main drawback of 3b is that if T becomes too small it becomes too small and stops exploring so after some time it may stuck at local min. So I decided to increase T if it becomes less than some value so it starts sim aneling again.
