Name: Huayue Hua

USC ID: 9817961224

Email: huayuehu@usc.edu

Lab9

1. For Mandatory part 1 MST:
2. I take <https://www.geeksforgeeks.org/kruskals-minimum-spanning-tree-algorithm-greedy-algo-2/> as a reference
3. To run “EE595\_Lab9\_9817961224\_part1.py”, the following command should be entered:

**python3 EE595\_Lab9\_9817961224\_part1.py**

1. Result:

A screenshot of a cell phone

Description automatically generated

1. For Mandatory part 2 Simulated Annealing:
2. I take <https://blog.csdn.net/tyhj_sf/article/details/53447731> and <https://blog.csdn.net/breeze_blows/article/details/102992740> as a reference.
3. To run “EE595\_Lab9\_9817961224\_part2.cpp”, the following command should be entered:

**g++ -o EE595\_Lab9\_9817961224\_part2.cpp**

1. For different beta:
2. Beta = 0.9

Distance sum:

37536.7 37536.7 36691.1 37536.7 37439

Total number of iterations:

150961 88709 11367 10928 84516

1. Beta = 0.92

Distance sum:

36691.1 37327.4 36691.1 36691.1 37536.7

Total number of iterations:

80929 94110 84591 187441 80648

1. Beta = 0.95

Distance sum:

36691.1 37439 37327.4 36691.1 37327.4

Total number of iterations:

119406 84237 84571 99078 11100

1. Beta = 0.97

Distance sum:

36691.1 37327.4 37327.4 3669.1 3669.1

Total number of iterations:

87018 22834 130362 33091 176332

1. Beta = 0.99

Distance sum:

37536.7 36691.1 36691.1 36691.1 37327.4

Total number of iterations:

222678 89056 79008 80169 16001

|  |  |  |  |
| --- | --- | --- | --- |
|  | Max final distance | Min final distance | Avg final distance |
| beta = 0.9 | 37536.7 | 36691.1 | 30749.28 |
| beta = 0.92 | 37536.7 | 36691.1 | 36987.5 |
| beta = 0.95 | 37439 | 36691.1 | 37095.2 |
| beta = 0.97 | 37536.7 | 36691.1 | 36945.62 |
| beta = 0.99 | 37536.7 | 36691.1 | 36987.5 |

1. From the result and table above, we can see that as beta increases, the min final distance appears more frequently. Therefore, we can conclude that higher beta contributes to better solution.