演算法Homework 20191227

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A screenshot of a social media post

Description automatically generated

1.

Using MST

1. Select the starting point randomly
2. Get MST from the starting point
3. Add each costs of edges by the order of development of vertices
4. Return the cost

The cost is not more than double of MST. If and only if all vertices u, v, w in V, w have c(u, w) ≤ c(u, v) + c(v, w), the cost is not also more than double of TSP. The reason why the max cost is double of MST is that every edge in MST is passed through 2 times.

2.

As well as using MST algorithm, all vertices u, v, w in V, w have c(u, w) ≤ c(u, v) + c(v, w),

So c(u, w) - c(v, w) + c(u, v) ≤ 2c(u, v). Then total cost is not more than the sum of 2c(u, v) on every edges. Therefore, it is a 2- approximation algorithm.