

Greedy Algorithm

Given or Input:

- (i) A connected graph $G = (V, E)$,
- (ii) real valued unit costs c_{ij} for all $(i, j) \in E$.

Want or Output:

\tilde{E} such that $G[\tilde{E}]$ is a **spanning tree** of G with **minimum total cost**,

$$\sum_{(i,j) \in \tilde{E}} c_{ij}$$

Initialize: Set $\tilde{E} \leftarrow \emptyset$

Step 1 Arrange the edges of G , i.e. E in non-decreasing cost order, and create a list, L .

Choose the first edge on the list L , say, (i, j) .

Step 2 Does the subgraph $G[\tilde{E} \cup \{(i, j)\}]$ create a cycle?

If *yes* then go to Step 3.

If *no* then go to Step 4.

Step 3 Choose the next edge on the list L , say (i, j) , and repeat Step 2.

Step 4 Update: $\tilde{E} \leftarrow \tilde{E} \cup \{(i, j)\}$

Check: Is $|\tilde{E}| = |V| - 1$?

If *yes* then STOP and output $G[\tilde{E}]$.

If *no* then go to Step 3.