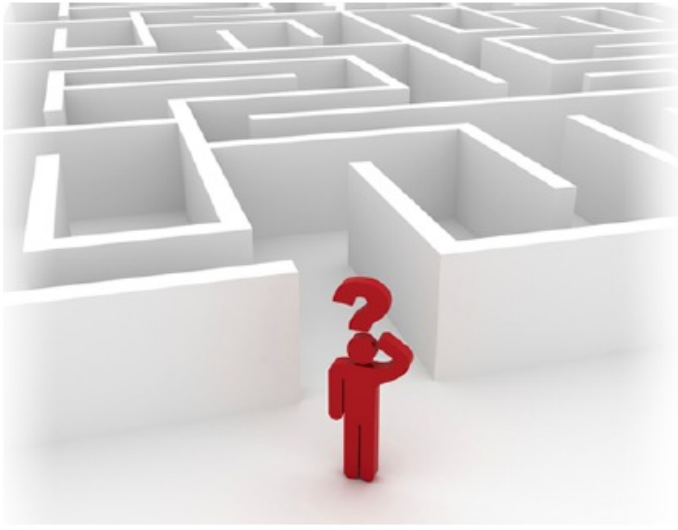


Minimum Spanning Trees

Algorithms: Design and Analysis, Part II

Kruskal's MST Algorithm

MST Review

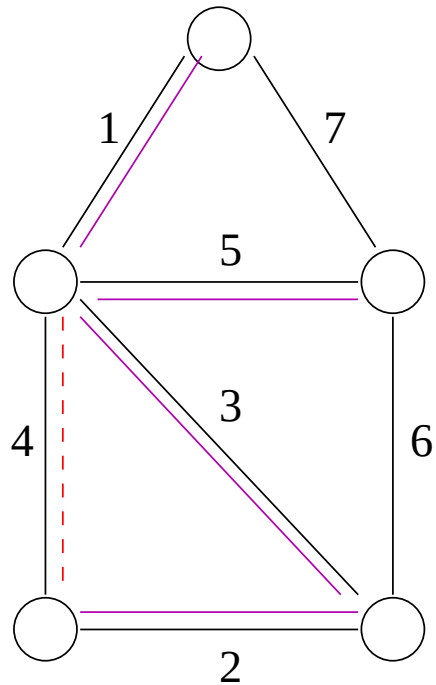
Input: Undirected graph $G = (V, E)$, edge costs c_e.

Output: Min-cost spanning tree (no cycles, connected).

Assumptions: G is connected, distinct edge costs.

Cut Property: If e is the cheapest edge crossing some cut (A, B), then e belongs to the MST.

Example



Kruskal's MST Algorithm

- Sort edges in order of increasing cost
[Rename edges $1, 2, \ldots, m$ so that $c_1 < c_2 < \ldots < c_m$]

- $T = \emptyset$

- For $i = 1$ to m

  - If $T \cup \{i\}$ has no cycles

  - Add i to T

- Return T