Minimum Spanning Trees

Kruskal's MST Algorithm

Algorithms: Design and Analysis, Part II

MST Review

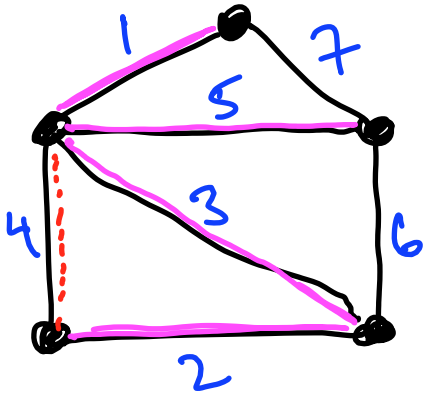
Input: undirected graph $G=(V,E)$, edge costs c_e.

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 $1, 2, 3, \ldots, m$ so that $c_1 < c_2 < \cdots < c_m$]
- $T = \emptyset$
- for $i = 1$ to m
  - if $T \cup \{i\}$ has no cycles
    - add i to T
- return T