**Minimum Weight Spanning Trees**

Suppose edges have weights:

![Graph with weights](image)

Find min weight spanning tree?

Build MST using **gray edges**

- Start with vertices
- Color components black & white
- gray edge ::= 
- add min weight gray edge

**Minimum Spanning Trees**

- initial components: isolated vertices
Minimum Spanning Trees

color components

Initial components: isolated vertices

Minimum Spanning Trees

gray edges

gray edges: min weight

repeat:

re-color components
Minimum Spanning Trees

re-color components

so gray edges must differ from previously selected

gray edges: min weight

repeat:
Minimum Spanning Trees

re-color components

gray edges

gray edges: min weight
Minimum Spanning Trees

Ways to grow an MST

• start at any vertex, keep building one tree. (Prim)
• keep choosing min weight edge between diff components (Kruskal)
• grow trees in parallel (Meyer)