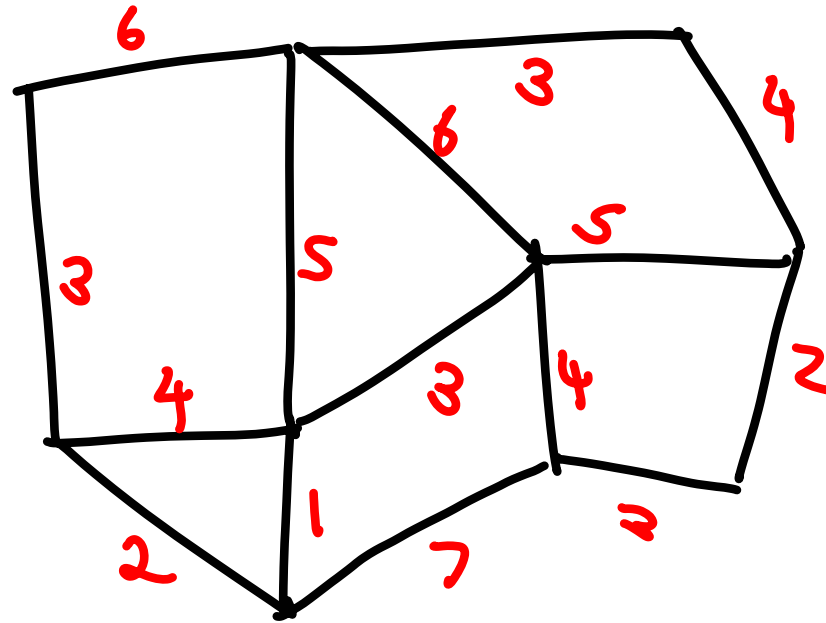
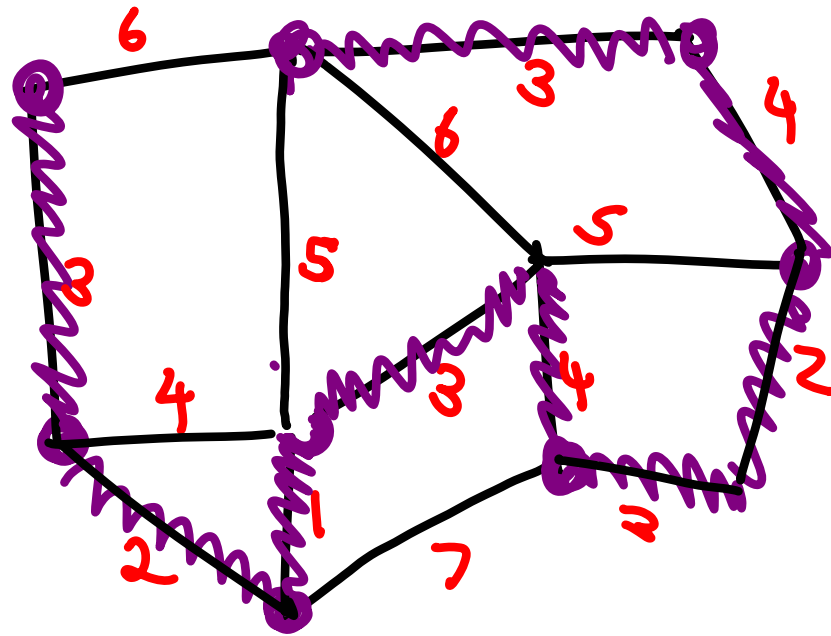


10/10/11

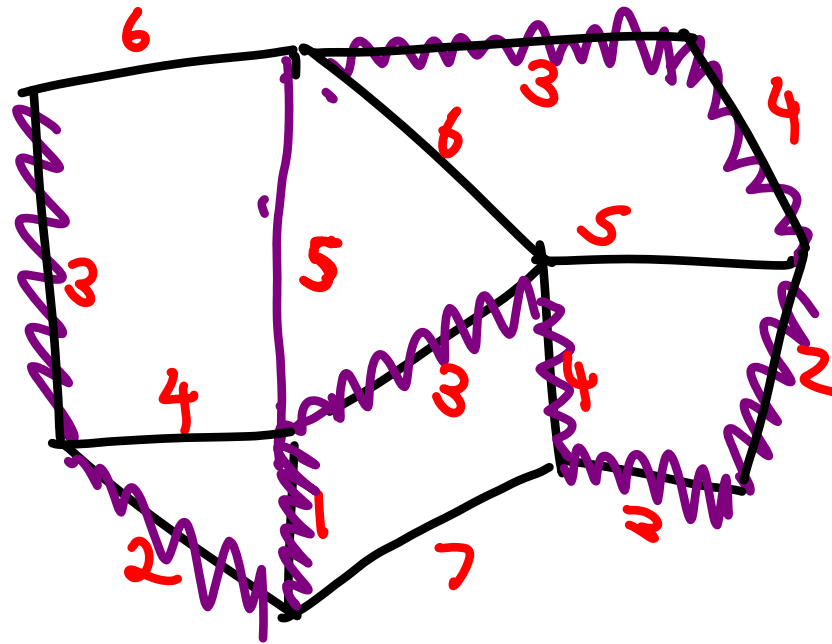
Minimum Spanning Tree Problem



Dijkstra Algorithm

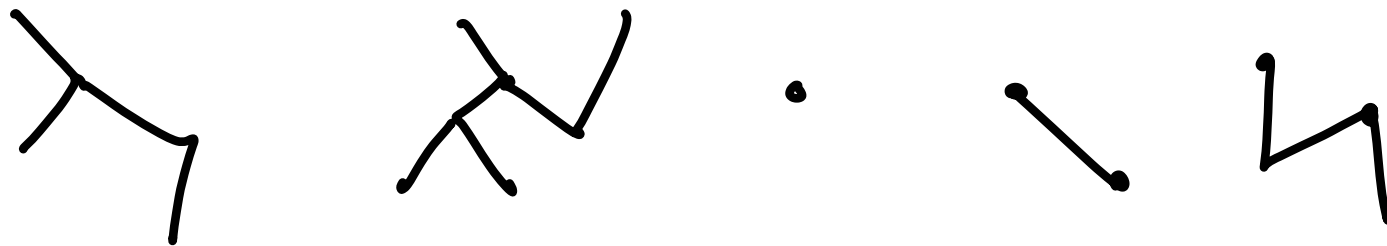


Greedy Algorithm [Myopic]



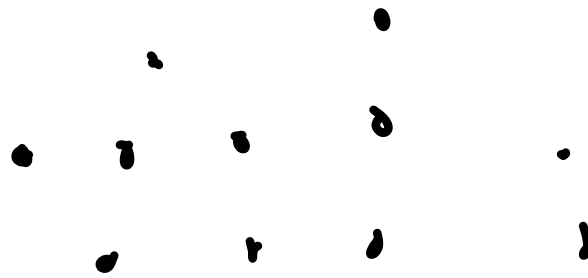
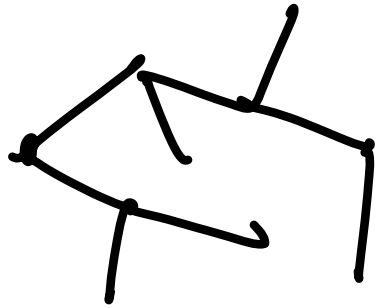
More general algorithm:

Suppose at some stage we have chosen a forest



Choose any tree T in the forest
and then choose the shortest edge with
one vertex in T .

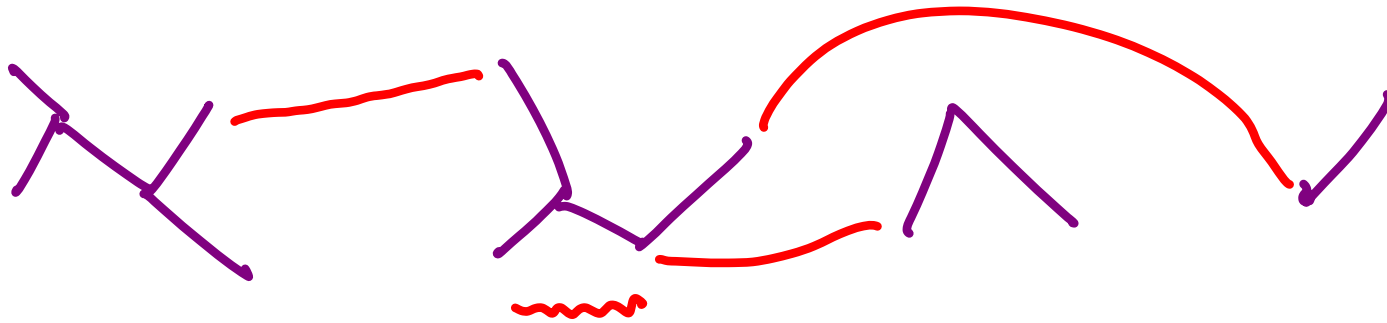
Dijkstra, always looks like



General Algorithm finds a minimum spanning tree :

Assume inductively that after adding k edges,
 $\exists$ some minimum weight spanning tree that
contains all of the chosen edges.

True for $k=0$.



Chosen

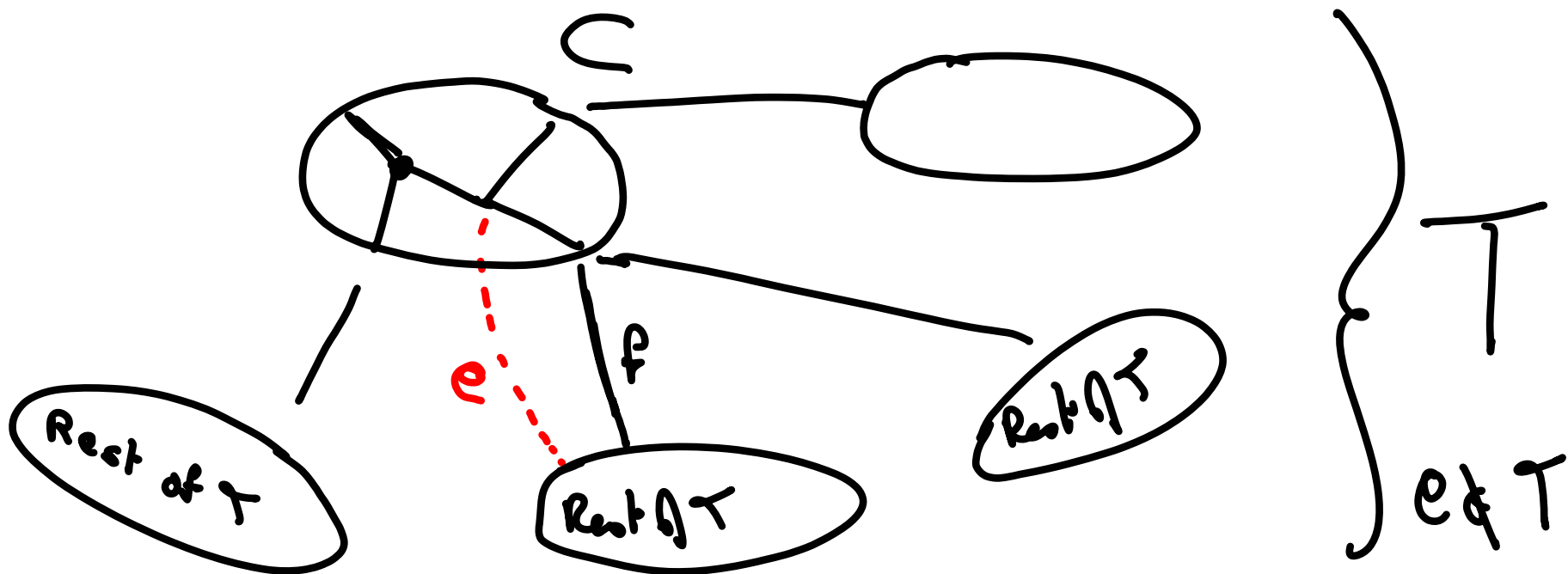
+

Red

= minimum
weight lines

Choose component C and edge e .

If $e \in T$ then T can be used for
the case $k+1$



$$w(e) \leq w(f)$$

$$\hat{T} = T + e - f \text{ is a tree and } w(\hat{T}) \leq w(T).$$

Integer Programming

Linear Integer Program:

$$\text{minimize } \underline{c}^T \underline{x}$$

$$A \underline{x} = b$$

$$\underline{x} \geq 0$$

x_i is an integer for $i \in I$

If all variables must be integers - PURE, otherwise MIXED