L23 - Minimum Cost Spanning Tree: Prim's Algorithm
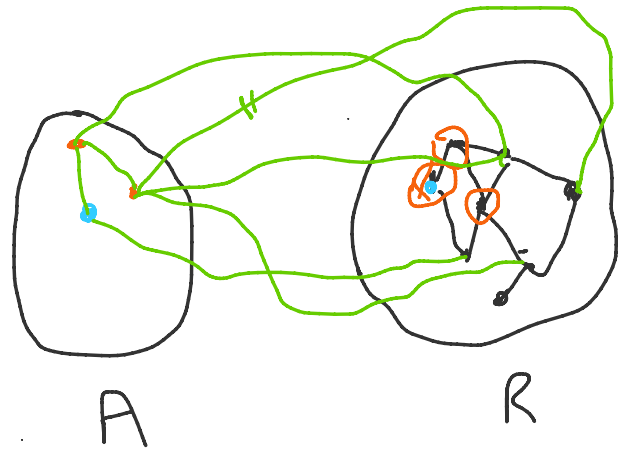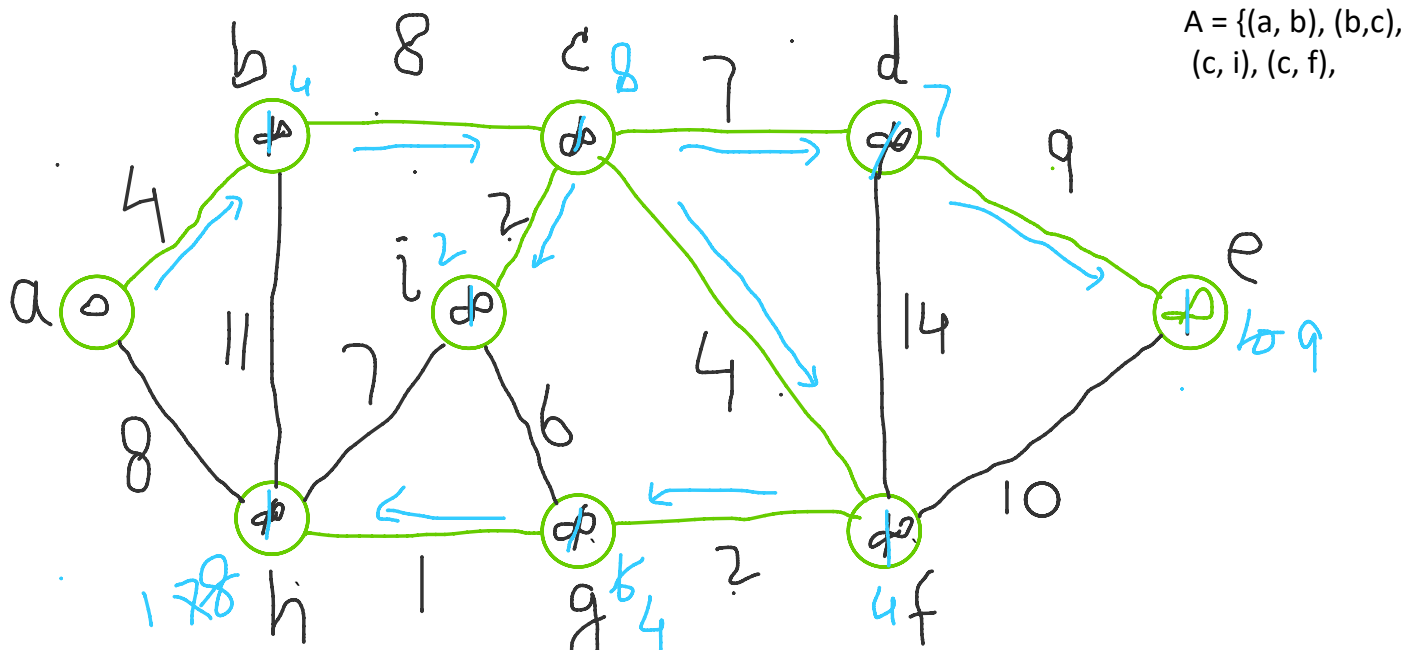
It grows the MST vertex by vertex.

A   R

MST-PRIM(G, w, r)
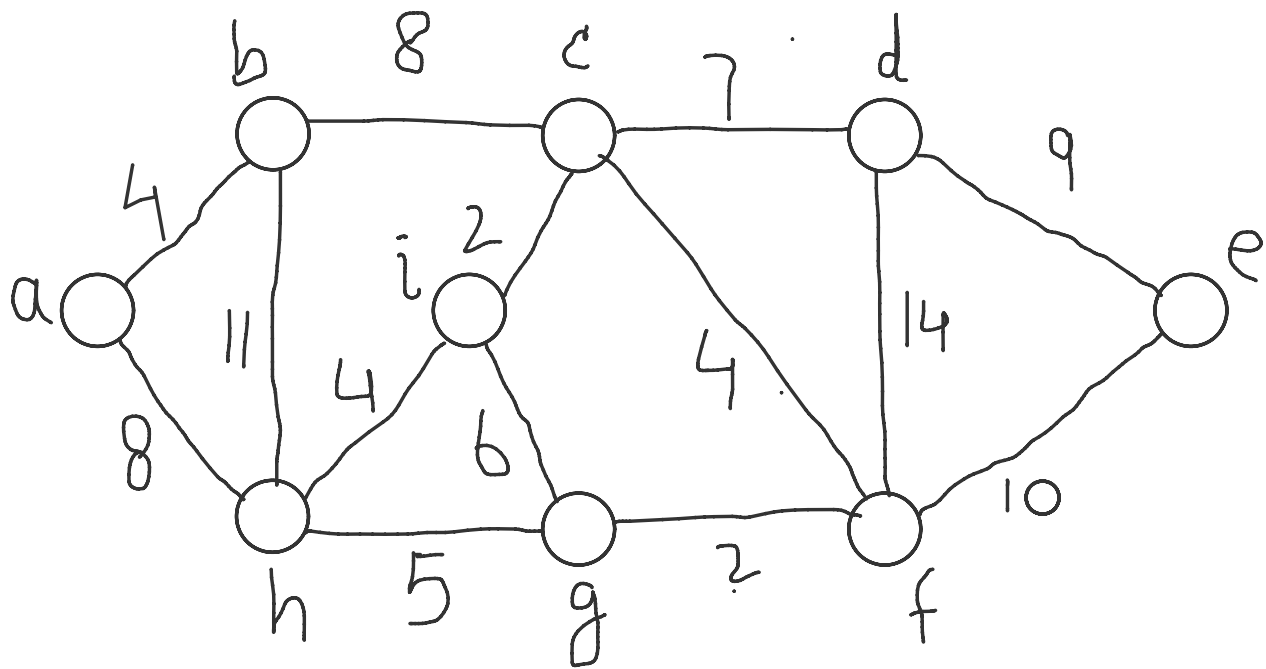
1. for each u ∈ G.V $O(|V|)$
2.   u. key = ∞
3.   u. π = NIL
4. r. key = 0
5. Q = G.V //Min. Priority Queue $O(|V| * \log(|V|))$ | $O(|V|)$
6. while Q ≠ Ø
7.   u = EXTRACT-MIN(Q) $O(|V| * \log(|V|))$
8.   for each v ∈ G. Adj[u] $O(|E|)$
9.   if v ∈ Q and w(u, v) < v. key
10.   v. π = u
11.   v. key = w(u, v) $O(|E|*\log(|V|))$
                 $O((|E|+|V|)*\log(|V|))$ = $O(|E|*\log(|V|))$

A = {(a, b), (b,c), (c, i), (c, f),

178 h 1 g 6 4 2 4 f

$A = \{$

4+8+2+1+2+4+7+9=37

4+8+4+2+2+4+7+9=40