Names: _____

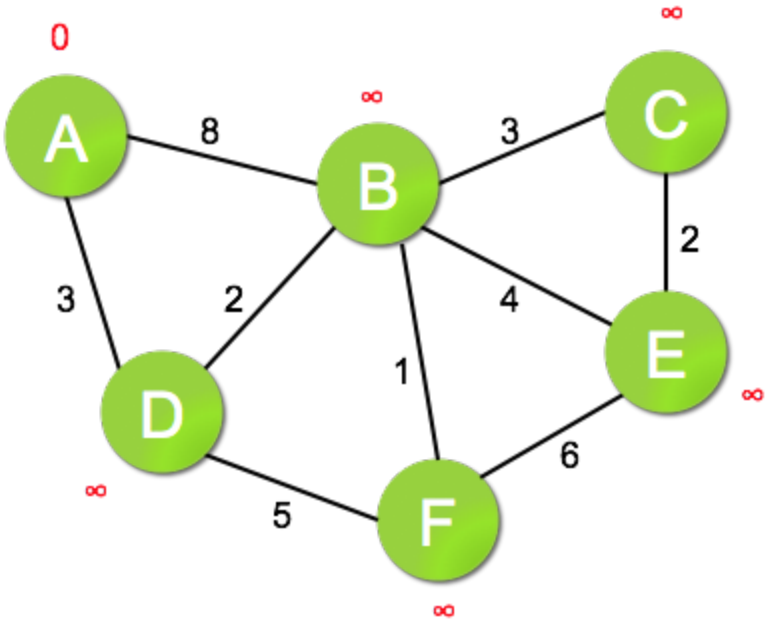
CS Logins: _____

Worksheet #15

MSTs: Prim's and Kruskal's

As always, sit with a partner and work through these together.

Activity 1: Prim-Jarnik



while PQ not empty:
    N = removeMin and circle it
    connect N to MST (except start node)
    for each neighbor M of N:
        update distance to M **if smaller**

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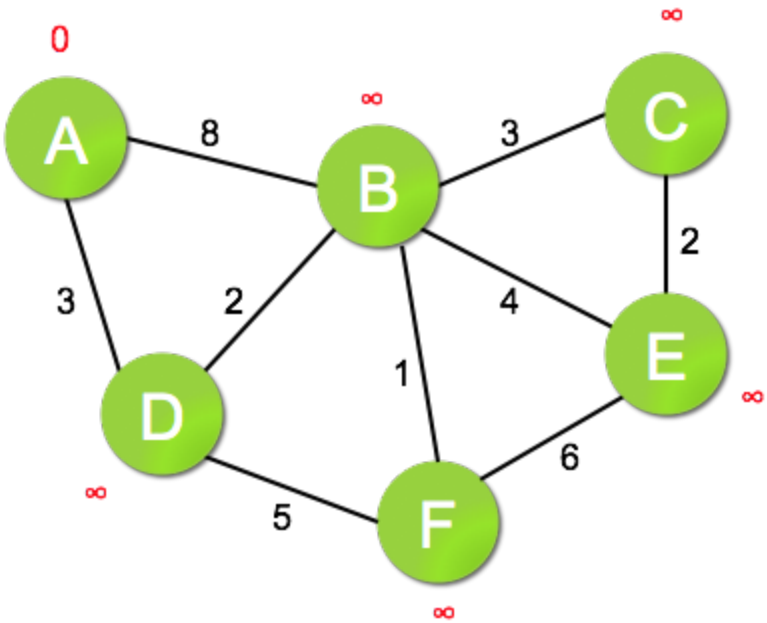

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Activity 2: Runtime of Prim-Jarnik's

Find the runtime of Prim-Jarnik's Algorithm based on the following pseudocode by filling in the runtime for each appropriate line of code.

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function prim(G):
   for all v in V:----------------------------------------   1. O(_________)
       v.cost = ∞
       v.prev = null
   source = a random v in V
   source.cost = 0
   MST = []
   PQ = PriorityQueue(V) ----------------------------------   2. O(_________)
   while PQ is not empty:---------------------------------    3. O(_________)
        v = PQ.removeMin()-------------------------------    4. O(_________)
       if v.prev != null:
             MST.append((v, v.prev))
        for all incident edges (v,u) of v: ----------------   5. O(_________)
             if u.cost > (v,u).weight:
                   u.cost = (v,u).weight
                   u.prev = v
                   PQ.replaceKey(u, u.cost)  -------------  6. O(_________)
  return MST
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Runtime of Prim-Jarnik's: _____

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