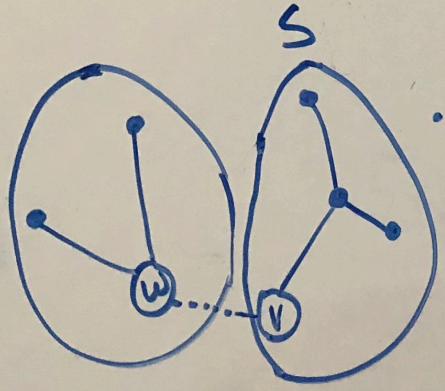
Kuskal's Algorithm Correctness Proof

Proof case 1: Suppose that adding e to T creates a cycle in T.

(ORDERED SMALLEST TO LARGEST) ⟶

- e is the max-cost edge in cycle c (TRUE)
  - According to cycle property, e is not in the MST.

Proof case 2: Suppose that adding $e=(v,w)$ to T does not create a cycle



- Let S be vertices in V's connected component in T.
- w is not in S (TRUE)
- e is the min-cost edge with exactly 1 endpoint in S.

(B/C ODERED SMALLEST TO LARGEST) SMALLEST EDGES HAVE ALREADY BEEN PROCESSED OR SKIPPED B/C THEY WOULD HAVE MADE A CYCLE.

↳ CUT PROPERTY