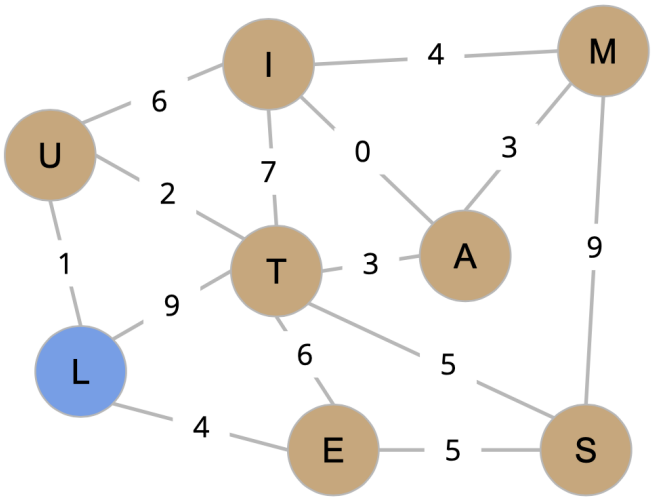
Kruskal's



(a) We want to run Kruskal's, but we have no cycle detection, so we terminate upon inserting $V - 1$ edges. Will this produce a valid MST on the graph above? If not, determine which edge(s) need to be changed, and to what. If there are many possibilities, choose the one that involves the minimum added/removed weight.

Assume ties are broken alphabetically, and edges are written in alphabetical order, and compared as such. For instance, if edges (A, Z) and (E, H) are equal, (A, Z) would be chosen before (E, H).

(b) After completing the previous part, Sohum wondered if it's possible to run Kruskal's with limited cycle detection. More specifically, he pondered: what if we can only detect a maximum of **k** cycles during one run of Kruskal's?

Looking at the specific instance of a 6 vertex graph, what is the **minimum** value of **k** for which we can ensure that Kruskal's will always work?