

- You are given a road network (a tree) with  $n \leq 10^5$  places, and a set of  $m \leq 5 \cdot 10^5$  bridges connecting places from the tree.
- The roads have given lengths up to  $10^6$ , bridges have length 0.
- Find the shortest tour that crosses all bridges, and uses each road at most once. It is guaranteed that this is possible.



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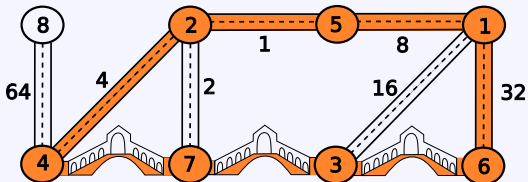


Illustration of Sample Input 1, with a shortest tour of length 45 highlighted.