Shortest Path02

Description

In a shortest path problem, we are given a weighted, undirected graph *G = (V, E)*, with weight function $\boldsymbol{w}: E \rightarrow R$ mapping edges to real–valued weights. The weight w(***p***) of path ***p*** = $<v_0, v_1, \ldots, v_k>$ is the sum of the weights of its constituent edges:

$$w(\boldsymbol{p}) = \sum_{i=1}^{k} w(\boldsymbol{v}_{i-1}, \boldsymbol{v}_i)$$

We define the shortest path weight $\delta(u, v)$ from u to v by

$$\delta(\boldsymbol{u}, \boldsymbol{v}) = \begin{cases} \min\{\boldsymbol{w}(\boldsymbol{p}): \boldsymbol{u} \sim \boldsymbol{v}\} & if\ there\ is\ a\ path\ from\ u\ to\ v \\ \infty & otherwise \end{cases}$$

A shortest path from vertex ***u*** to ***v*** is then defined as any path ***p*** with weight $w(\boldsymbol{p}) = \delta(\boldsymbol{u}, \boldsymbol{v})$.

In each search, if there is more than one vertex to visit, then you should visit the vertex with a lower value for its label.

Find the length of the shortest path between vertices ***u*** and ***v***, ($\delta(\boldsymbol{u}, \boldsymbol{v})$) when a weighted graph ***G*** = (***V***, ***E***) is given.

You may assume all given graphs are simple and connected. Simple means that there are no two edges connecting the same vertices or an edge that begins and ends at the same edge. Connected means that any vertex in the graph can be reached from any given vertex.

Input

Your program is to read from standard input. In first line of input you are given four numbers, the number of vertices ***V*** (1 ≤ ***V*** ≤ 100000), the number of edges ***E*** (1 ≤ ***E*** ≤ 1000000), label of source vertex ***u*** and the label of destination vertex ***v***, each separated by a space. On the following lines, the edges are given. On each line, two vertices are given by their labels and the weight of the edge ***z*** (1 ≤ ***z*** ≤ 100) between the two vertices is given, each separated by a space.

Output

Your program is to write to standard output. Print the $\delta(\boldsymbol{u}, \boldsymbol{v})$ on a single line.

Sample

Input	Output
6 9 1 4 1 2 3 1 3 2 1 5 6 2 5 1 2 4 4 3 4 4 3 5 5 4 6 2 5 6 1	6