Single Source Shortest Path

Problem Description

Solve the Single Source Shortest Path problem.

Input Specification

Line 1: N ($2 \le N \le 1000$) (vertices), M ($1 \le M \le 5000$) (bidirectional edges)

Lines 2 to M+1: u_i,v_i,w_i $(1 \le u_i,v_i \le N, 1 \le w_i \le 10\,000)$, a bidirectional edge from u_i to v_i with weight w_i . Multiple edges between the same pair of vertices may occur in the input.

Output Specification

Lines 1 to N: line i has the length of the shortest path from vertex 1 to vertex i. If no path exists, output -1.

Sample Input

4 3 1 2 2 1 3 5 2 3 2

Sample Output

0 2 4 -1