

Day-7**Time:** 1 hour 30 min.

Question no. 1.

A thief robbing a store can carry a maximal weight of W into his knapsack. There are N items, and i -th item weight ' W_i ' and the value being ' V_i .' What would be the maximum value V , that the thief can steal?

Input Format :

The first line of the input contains an integer value N , which denotes the total number of items.

The second line of input contains the N number of weights separated by a single space.

The third line of input contains the N number of values separated by a single space.

The fourth line of the input contains an integer value W , which denotes the maximum weight the thief can steal.

Output Format :

Print the maximum value of V that the thief can steal.

Constraints :

 $1 \leq N \leq 20$ $1 \leq W_i \leq 100$ $1 \leq V_i \leq 100$

Sample Input 1 :

4

1 2 4 5

5 4 8 6

5

Sample Output 1 :

13

Sample Input 2 :

5

12 7 11 8 9

24 13 23 15 16

26

Sample Output 2 :

51

Question no 2.

Given an undirected, connected and weighted graph $G(V, E)$ with V number of vertices (which are numbered from 0 to $V-1$) and E number of edges.

Find and print the shortest distance from the source vertex (i.e. Vertex 0) to all other vertices (including source vertex also) using Dijkstra's Algorithm.

Input Format :

Line 1: Two Integers V and E (separated by space)

Next E lines : Three integers e_i , e_j and w_i , denoting that there exists an edge between vertex e_i and vertex e_j with weight w_i (separated by space)

Output Format :

For each vertex, print its vertex number and its distance from source, in a separate line. The vertex number and its distance needs to be separated by a single space.

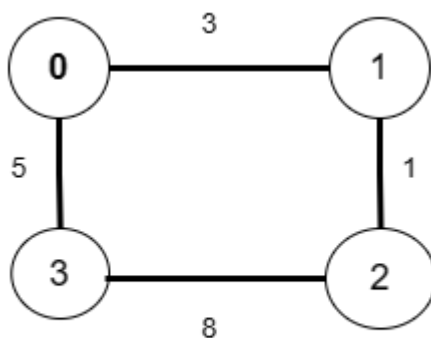
Note : Order of vertices in output doesn't matter.

Constraints :

$2 \leq V, E \leq 10^5$

Sample Input 1 :

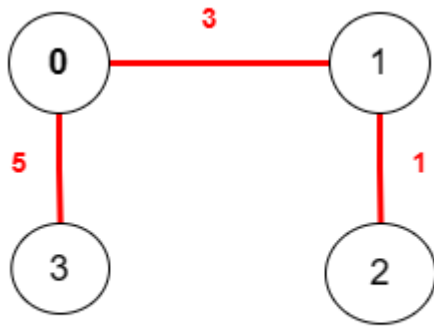
```
4 4
0 1 3
0 3 5
1 2 1
2 3 8
```



Input Graph

Sample Output 1 :

```
0 0
1 3
2 4
3 5
```



Minimum Spanning Tree

Question no . 3)

Assume that the value of $a = 1$, $b = 2$, $c = 3$, ... , $z = 26$. You are given a numeric string S . Write a program to return the list of all possible codes that can be generated from the given string.

Note : The order of codes are not important. And input string does not contain 0s

Input format :

A numeric string

Constraints :

$1 \leq \text{Length of String } S \leq 10$

Sample Input:

1123

Sample Output:

aabc

kbc

alc

aaw

kw