Homework 3

Fertile grasslands 2

In the first homework you helped Ghita determine how good a grassland is. Using your program he has determined which are the best K grasslands in his area out of a total of N. These N grasslands are connected by bidirectional roads.

Now Ghita wants to move his farm to a new grassland from the N ones in his area. However, he doesn't want to build the farm on one of the K grasslands as he will ruin precious grass. Daily, in order to feed his sheep, he will start from his new farm, then visit all the K grasslands in any order and return back with the flock of sheep to the new farm. Help Ghita find the optimal grassland to pick for his new farm such that he and his sheep will travel the minimum distance each day starting from the farm, through the K grasslands and back.

Given the N grasslands and the K best grasslands help Ghita choose the optimal grassland from the N – K grasslands such that his sheep travel the smallest distance to pass through all K grasslands and return back home.

Input data

In the file 'grasslands.in' there are:

- On the first line 3 integers N M K
- On the next K line the best grasslands (an int)
- On the next M lines the bidirectional roads 3 ints (source destination length)

Output Data

In the file 'grasslands.out' the minimum distance the sheep have to travel if Ghita builds the farm on an optimal grassland and they pass through all the K grasslands.

Example

Grasslands.in	12

`5  6  3`
`1`
`2`
`3`
`1  2  1`
`1  5  2`
`3  2  3`
`3  4  5`
`4  2  7`
`4  5  10`
	Justification :
	The farm is built on grassland 5. The sheep go on the route 5,1,2,3,2,1,5. The total distance is 12

Restrictions

M ∈ [1,50000], N ∈ [1,10000], K ∈ [1,5]

The distance of the roads is between 1 and 1000

Sending the solutions

The solutions should have a Readme file that should contain:

1. a short description of the algorithms you used,

2. the complexity of the algorithms (you must compute it).

Send the solutions in a .zip archive with the name HW_<number>_<name>_<group>.zip (e.g. HW_3_PopescuAndrei_1231E.zip) by email to: alexandru.daniel.mirea@gmail.com

The deadline for receiving the homework is 22nd of January 2014, at 23:59.

Rules for assignments: http://adcfils.wordpress.com/assignements/