

Задача А. Длиннейший путь

Имя входного файла: a.in
Имя выходного файла: a.out
Ограничение по времени: 1 с
Ограничение по памяти: 256 Мб

Дан ориентированный граф без циклов. Требуется найти в нем длиннейший путь.

Формат входного файла

Первая строка входного файла содержит два натуральных числа n и m — количество вершин и дуг графа соответственно. Следующие m строк содержат описания дуг по одной на строке. Ребро номер i описывается двумя натуральными числами b_i и e_i — началом и концом дуги соответственно ($1 \leq b_i, e_i \leq n$).

Входной граф не содержит циклов и петель.

$n \leq 10\,000$, $m \leq 100\,000$.

Формат выходного файла

Первая строка выходного файла должна содержать одно натуральное число — количество дуг в длиннейшем пути.

Пример

a.in	a.out
5 5 1 2 2 3 3 4 3 5 1 5	3

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Имя входного файла:      b.in
Имя выходного файла:     b.out
Ограничение по времени:  1 с
Ограничение по памяти:    256 Мб
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Формат входного файла

Формат выходного файла

Пример

[illegible]

У этой задачи есть решение за $O(nk)$.

Задача C. Ideal Path

Имя входного файла: c.in
 Имя выходного файла: c.out
 Ограничение по времени: 2 s
 Ограничение по памяти: 256 Мб

New labyrinth attraction is open in New Lostland amusement park. The labyrinth consists of n rooms connected by m passages. Each passage is colored into some color c_i . Visitors of the labyrinth are dropped from the helicopter to the room number 1 and their goal is to get to the labyrinth exit located in the room number n .

Labyrinth owners are planning to run a contest tomorrow. Several runners will be dropped to the room number 1. They will run to the room number n writing down colors of passages as they run through them. The contestant with the shortest sequence of colors is the winner of the contest. If there are several contestants with the same sequence length, the one with the *ideal path* is the winner. The path is the ideal path if its color sequence is the lexicographically smallest among shortest paths.

Andrew is preparing for the contest. He took a helicopter tour above New Lostland and made a picture of the labyrinth. Your task is to help him find the ideal path from the room number 1 to the room number n that would allow him to win the contest.

Примечание

A sequence (a_1, a_2, \dots, a_k) is lexicographically smaller than a sequence (b_1, b_2, \dots, b_k) if there exists i such that $a_i < b_i$, and $a_j = b_j$ for all $j < i$.

Формат входного файла

The first line of the input file contains integers n and m — the number of rooms and passages, respectively ($2 \leq n \leq 100\,000$, $1 \leq m \leq 200\,000$). The following m lines describe passages, each passage is described with three integer numbers: a_i , b_i , and c_i — the numbers of rooms it connects and its color ($1 \leq a_i, b_i \leq n$, $1 \leq c_i \leq 10^9$). Each passage can be passed in either direction. Two rooms can be connected with more than one passage, there can be a passage from a room to itself. It is guaranteed that it is possible to reach the room number n from the room number 1.

Формат выходного файла

The first line of the output file must contain k — the length of the shortest path from the room number 1 to the room number n . The second line must contain k numbers — the colors of passages in the order they must be passed in the ideal path.

Пример

c.in	c.out
4 6	2
1 2 1	1 3
1 3 2	
3 4 3	
2 3 1	
2 4 4	
3 1 1	

Задача D. Strange People

Имя входного файла: d.in
 Имя выходного файла: d.out
 Ограничение по времени: 0.5 s
 Ограничение по памяти: 4 Mb

Примечание

Source — Winter 2002 Author: Nikolay Marinov

<http://acm.sgu.ru/problem.php?contest=0&problem=145>

Once upon a time in one kingdom lives strange people. In this kingdom to travel from city to city there was a taxes. But people don't want to travel cheaper from one place to another. They want to travel from place to place by K-th simple expensive path between this cites. Your task is to find how much money they must prepare to go from one given city to another (also given) if they travel using K'th simple expensive path between these two cites. And you must print that path. (if there exist many solutions output any of them) It is guarantee that K'th expensive path between this cites exist. If there is road between city X and Y than there is road between Y and X. Between two cites exists no more than 1 road.

Ограничения

4 ≤ N - number of cites ≤ 100
 M - number of roads
 1 ≤ taxes between two cites ≤ 10000
 1 ≤ K - the K'th expensive path to find ≤ 500

Формат входного файла

N M K
 x y mon |
 x y mon | ... | M lines
 x y mon |
 xs xe

where xs is start city and xe is end city x and y is pairs of integer that are numbers of two cites and mon is tax between this cites

Формат выходного файла

Z dc
 x1 x2 x3 x4 .. xn

where Z is the cost of the K'th expensive path and x1 x2 ... xn is the path dc is number of cites in (x1 x2 x3 ... xn)

Пример

d.in	d.out
5 10 3	35 2
1 2 6	1 5
1 3 13	
1 4 18	
1 5 35	
2 3 14	
2 4 34	
2 5 17	
3 4 22	
3 5 15	
4 5 34	
1 5	