

Lakshadwipa



Warning!!! Read Moodle's [A9 PDF](#) for a more complete description. The below description might be incomplete.

Lakshadwipa, which means one hundred thousand islands" in Sanskrit. Honey is planning for a trip to those islands this weekend. Since she is going without the knowledge of her guide, she has to return in 48 hours. So, she needs your help to guide her in few aspects.

Lakshadwipa has N cities named $1..N$ distributed among C islands. Cities in the same island are connected by equidistant roads. If roads of some cities(3 or more) in a island may be connected in a circular fashion, such an island is called as **circular-island**. In Lakshadwipa, there could be many circular islands or none based on season she plans her trip. Why? Because due to varying sea-level during seasons some roads between the cities might be submerged.

Biggest island: Island with the most number of cities. If there are two such islands, one with largest city number is considered as biggest island. Only the biggest island has food and drinking water. The only way to enter the biggest island is through the smallest city on that island. i.e. The entrance city(henceforth referred as the entrance) of the biggest island is the smallest numbered city in it.

Smallest island: Island with the least number of cities. If there are two such islands, one with smallest city number is considered as Smallest island. The only way to enter the smallest island is through the largest city on that island. In other words, the entrance of the smallest island is that largest numbered city in it.

Honey wants to buy food and travel to smallest island to enjoy the scenery. So help her with the following details.

1. Find the number of islands in Lakshadwipa.
2. Find if there is at least one circular-island in Lakshadwipa. Print YES, if one exist; NO otherwise.
3. To buy the necessities, she needs a list of neighbor cities (from the entrance of biggest island)that are reachable in at most k -distance. List them in sorted(ascending) order. If there is no such neighbours print -1.
4. Sceneries are too good in smallest island. So, she is planning to visit all the cities in the **smallest island**. She starts from the entrance at time 0hrs. She spends 2hrs in each city before moving to the next city. Time taken to travel between two cities is 1hr. She wants to visit the cities in Depth First Search (DFS) manner. Since the cities are being visited in DFS manner, there is a possibility that few cities will be visited more than once. She will spend 2hrs in a city only for the first time. So for all the cities(in sorted order) in smallest island, print the city number, the times when she enters the city for first time(start time) and leaves the city for the last time(finish time).

NOTE: At any point of time, if you have multiple cities to visit next, then choose the one with least number.

Never mind even if the trip exceed 48 hours she could take sick leaves from her guide :)

Input Format

N R k

x_1 y_1

x_2 y_2

.

$x_R y_R$

R lines indicating road between city x_i and y_i .

Constraints

Your code must have the following class:

```
class Graph {
private:
    int V; //number of vertices
    list<int> *adj; //adjacency list for representing graph
    // any other data members you require ..
public:
    Graph(int V);
    void add_edge(int v, int w); //v,w are the vertices of an edge
    //other member functions required for solving the question
};
```

Output Format

C YES/NO

List of space separated neighbouring cities of entrance in sorted order(as specified in point 3 above).

$city_1 Fin_1 Lout_1$

$city_2 Fin_2 Lout_2$

$city_s Fin_s Lout_s$

Fin and $Lout$ of all smallest island cities in ascending order of cities.

Sample Input 0

```
16 13 2
1 2
4 5
10 11
2 3
5 6
5 7
7 8
11 12
9 8
12 13
3 1
15 14
16 15
```

Sample Output 0

```
4 YES
5 6 7
1 3 9
2 6 8
3 0 10
```

Sample Input 1

```
10 9 2
```

```
3 1
1 2
6 5
2 3
4 5
4 6
10 9
9 7
7 8
```

Sample Output 1

```
3 YES
8 9 10
1 3 9
2 6 8
3 0 10
```