IOI Training Camp 2018 Final Test 1

K Perfect Matchings

You are given a bipartite graph $G = (U, V, E)$, and an integer K. U and V are the two bipartitions of the graph such that $|U| = |V| = N$, and E is the edge set. The vertices of U are $\{1, 2, \ldots, N\}$ and that of V are $\{N+1, N+2, \ldots, 2N\}$. You need to find out whether the total number of different perfect matchings in G is strictly greater than K or not.

Recall that a perfect matching is a subset of E such that every vertex of the graph belongs to exactly one edge in the subset. Two perfect matchings are considered to be different even if one edge is different.

Input

First line of the input contains three integers: N, M and K, which represent $|U|$ (which is also equal to $|V|$), $|E|$ and the queried threshold respectively.
The i-th of the next E lines contains two numbers L_i and R_i which denote the i-th edge is between the vertices L_i and R_i.

Output

A single line containing "Yes" if the number of perfect matchings is greater than K, and "No" othewise.

General Constraints

Unless otherwise mentioned, the following constraints are met throughout all subtasks:

- $1 \leq N \leq 100$
- $1 \leq M \leq 600$
- $0 \leq K \leq 10^5$
- $1 \leq L_i \leq N < R_i \leq 2 * N$

Subtasks

Subtask 1 (10 Points):

- $K = 0$

Subtask 2 (30 Points):

- $1 \leq N \leq 50$
- $1 \leq M \leq 100$
- $0 \leq K \leq 300$

Subtask 3 (60 Points):

- No further constraints.

Sample Input 1

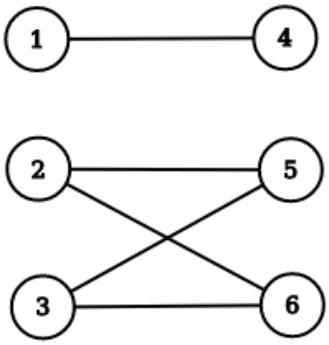
```
3 5 2
1 4
2 6
2 5
3 5
3 6
```

Sample Output 1

```
No
```

Explanation 1

The graph is as follows:



There are exactly two perfect matchings in this graph: $\{(1,4),(2,5),(3,6)\}$ and $\{(1,4),(2,6),(3,5)\}$. The number of perfect matchings is not $> K$, and hence the output is "No".

Sample Input 2

```
3 5 1
1 4
2 6
2 5
3 5
3 6
```

Sample Output 2

```
Yes
```

Explanation 2

The graph is the same as previous one, and the same 2 perfect matchings are present. But now, K is 1. Therefore, the number of perfect matchings is $> K$, and hence the output is "Yes".

Limits

Time: 3 seconds

Memory: 512 MB