Problem C
Coloring Polygon

You are given a convex polygon with n vertices. The vertices are numbered from 1 to n in close-wise direction. A diagonal is a line segment joining two non-consecutive vertices of the polygon. Formally, a diagonal connects two vertices u and v of the polygon where $|u - v| \notin \{1, n - 1\}$.

This problem contains two steps:

1. Firstly, you need to partition this polygon into $n - 2$ triangles using $n - 3$ diagonals. Every valid partition is uniquely defined by a set of $n-3$ diagonals of the polygon where the chosen diagonals only intersect other at their ends. In other words, if two diagonals of a valid partition share some common point, the common point must be some vertex of the polygon. You are given k diagonals $(u_1, v_1), (u_2, v_2), \ldots, (u_k, v_k)$, you need to find $n - 3 - k$ other diagonals to form a valid partition.

2. Secondly, you need to color all $n - 2$ triangles of the polygon using m colors (which are numbered from 1 to m), so that every triangle is colored by exactly one color, and two triangles sharing a side must be colored differently.

Let z be a valid partition which can be obtained in the first step, we define $f(z)$ as the number of ways we can color triangles in the second step. You have to calculate two values:

- $P = \min f(z)$, i.e the minimum possible number of valid colorings in the second step, considering all valid partitions in the first step.
- Q is the number of valid partition z such that $f(z) = P$; in other words, the number of valid partitions in the first step which results in the minimum number of valid colorings in the second step.

Input

The first line of the input contains 3 integers n, k and m ($3 \le n \le 10^5, 0 \le k \le n-3, 1 \le m \le 10^5$).

In the next k lines, the i^{th} one contains two integers u_i and v_i ($1 \le u_i, v_i \le n$) representing a diagonal joining two vertices u_i and v_i of the polygon.

It is guaranteed that these k diagonals only intersect at their ends.

Output

Print two integers in a single line — the values of P and Q respectively. Since these values can be rather large, you should print them modulo $998\,244\,353$.

Sample Input 1	Sample Output 1
4 0 2	2 2

Sample Input 2	Sample Output 2
6 3 3 2 4 4 6 6 2	24 1