D. Konrad and Company Evaluation

time limit per test: 4 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Konrad is a Human Relations consultant working for VoltModder, a large electrical equipment producer. Today, he has been tasked with evaluating the level of happiness in the company.

There are n people working for VoltModder, numbered from 1 to n. Each employee earns a different amount of money in the company — initially, the i-th person earns i rubles per day.

On each of q following days, the salaries will be revised. At the end of the i-th day, employee v_i will start earning $n + i$ rubles per day and will become the best-paid person in the company. The employee will keep his new salary until it gets revised again.

Some pairs of people don't like each other. This creates a great psychological danger in the company. Formally, if two people a and b dislike each other and a earns more money than b, employee a will brag about this to b. A *dangerous triple* is a triple of three employees a, b and c, such that a brags to b, who in turn brags to c. If a dislikes b, then b dislikes a.

At the beginning of each day, Konrad needs to evaluate the number of *dangerous triples* in the company. Can you help him do it?

Input

The first line contains two integers n and m ($1 \le n \le 100\,000$, $0 \le m \le 100\,000$) — the number of employees in the company and the number of pairs of people who don't like each other. Each of the following m lines contains two integers a_i, b_i ($1 \le a_i, b_i \le n$, $a_i \neq b_i$) denoting that employees a_i and b_i hate each other (that is, a_i dislikes b_i and b_i dislikes a_i). Each such relationship will be mentioned exactly once.

The next line contains an integer q ($0 \le q \le 100\,000$) — the number of salary revisions. The i-th of the following q lines contains a single integer v_i ($1 \le v_i \le n$) denoting that at the end of the i-th day, employee v_i will earn the most.

Output

Output $q + 1$ integers. The i-th of them should contain the number of *dangerous triples* in the company at the beginning of the i-th day.

Examples

input

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

output

```
4
3
2
```

input

```
3 3
1 2
2 3
1 3
5
1
2
2
```

```
1
3
```

output Copy

```
1
1
1
1
1
1
```

Note

Consider the first sample test. The i-th row in the following image shows the structure of the company at the beginning of the i-th day. A directed edge from a to b denotes that employee a brags to employee b. The dangerous triples are marked by highlighted edges.