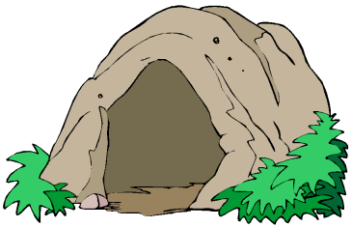


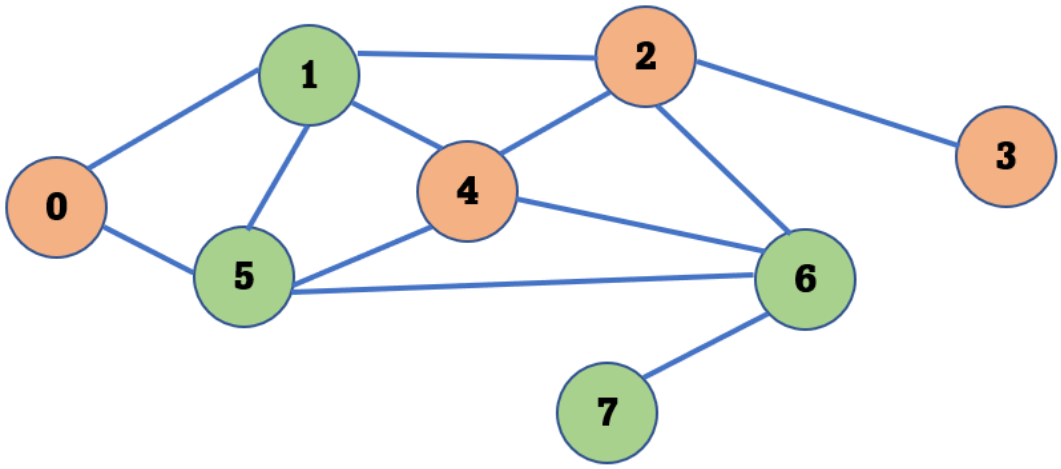
Caves & Volcanoes Hiking Trail

Intermediate Python project: Stack, Undirected Graph, DFS

Intro

A tourist guide from The Ancient Volcanoes National park is planning a new series of short one-day guided walks for beginner hikers. There are two main tourist attractions in the park – volcanoes and caves. Each route will visit exactly 2 volcanoes and 2 caves. The walk will start at a cave, then go to a volcano, then proceed to another cave, then to another volcano, and finally return to a cave where it started. There are many paths which connect volcanoes and caves for more experienced hikers but the guide is choosing the direct path for beginners.

Example



The graph on the left represents the parks attractions and paths connecting them. Orange circles represent caves and green circles represent volcanoes. The lines connecting the circles represent the paths between them.

If we start from the cave 0, we have the following 2 paths: [0, 1 , 4, 5 , 0] and [0, 5, 4, 1, 0]
Analogically, we have 2 paths starting from the cave 2: [2, 1, 4, 6, 2] and [2, 6, 4, 1, 2]
From the cave 4, we have 4 different paths: two connecting it with cave 0 and two with cave 2.
Therefore for this graph we have 8 trails in total.

Input

```
8 12
0 1
0 5
1 5
1 4
5 4
5 6
1 2
4 2
4 6
2 6
2 3
7 6
0 C
4 C
2 C
3 C
1 V
5 V
7 V
6 V
```

As the input, we are given a .txt file which contains the information about the park´s size and it´s attractions. The data is given in the way presented below.

The first input line contains two integers N, M separated by space, where N is number of points of interest and M - the number of paths between them.

The points of interest are labeled by integers 0, 1, ..., N−1. Next, there are M text lines, each describes one path. The path connects two points of interest, the line contains their labels separated by space.

Finally, there are N text lines. Each line specifies the type of a particular point of interest. The line contains the label of the point of interest and a capital letter C for cave or V for volcano.

The values are separated by space. The order of paths and points of interest in the input is arbitrary.

Output

The output contains one text line with one integer representing the total number of possible planned paths.

While practicing or debugging we can print our the paths we find as well as the total number of possible paths and our output for the example input might look like that: