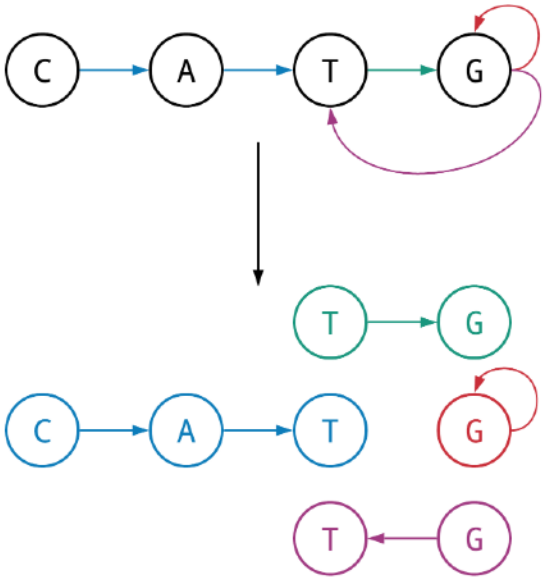
3M Generate All Maximal Non-Branching Paths in a Graph

Maximal Non-Branching Path Problem
Find all maximal non-branching paths in a graph.

Input: A directed graph.
Output: The collection of all maximal non-branching paths in this graph.



Formatting

Input: An adjacency list representing a directed graph.
Output: A newline-separated collection of all maximal non-branching path in the graph where each maximal non-branching path is represented as a space-separated list of integer node labels.

Constraints

- The number of nodes in the graph will be between 1 and 10^3.
- The number of edges in the graph will be between 1 and 10^3.
- All nodes in the graph will be labeled with integers.

Test Cases

Case 1

Description: The sample dataset is not actually run on your code.

Input:

```
1:  2
2:  3
3:  4 5
6:  7
7:  6
```

Output:

```
1 2 3
3 4
3 5
6 7 6
```

Case 2

Description: The sample dataset is not actually run on your code.

Input:

```
0:  1
1:  2
2:  3 4
```

Output:

```
0 1 2
2 3
2 4
```

Case 3

Description: The sample dataset is not actually run on your code.

Input:

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

Output:

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

Case 4

Description: The sample dataset is not actually run on your code.

Input:

```
1:  2
2:  3 4 5
4:  6 10
5:  7
6:  10
```

Output:

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

Case 5

Description: The sample dataset is not actually run on your code.

Input:

```
7:  10
10:  14
14:  3 5 18
5:  4
52:  13
4:  8
8:  14
18:  19
19:  31
31:  52
```

Output:

```
7 10 14
14 3
14 5 4 8 14
14 18 19 31 52 13
```

Case 6

Description: The sample dataset is not actually run on your code.

Input:

```
7:  3
3:  4
4:  8
8:  9
9:  7
1:  2
2:  5
5:  10
10:  2
16:  111
111:  16
```

Output:

```
1 2
2 5 10 2
9 7 3 4 8 9
111 16 111
```

Case 7

Description: A larger dataset of the same size as that provided by the randomized autograder. Check input/output folders for this dataset.