Exercise 4

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Lecture Sequence due Dec 15, 2022 07:30 +08 Completed

Exercise 4

7/7 points (graded)

Consider our continuing problem of permutations of three students in a line. Use the enumeration we established when adding the nodes to our graph. That is,

```
nodes = []
nodes.append(Node("ABC")) # nodes[0]
nodes.append(Node("ACB")) # nodes[1]
nodes.append(Node("BAC")) # nodes[2]
nodes.append(Node("BCA")) # nodes[3]
nodes.append(Node("CAB")) # nodes[4]
nodes.append(Node("CBA")) # nodes[5]
```

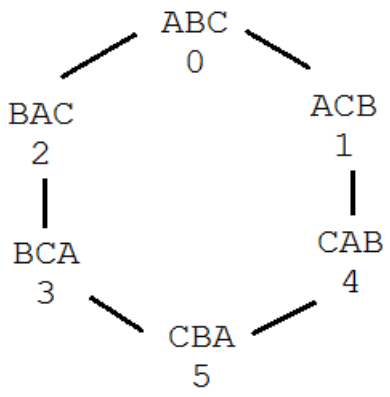
so that ABC is Node 0, BCA is Node 3, etc.

Using Depth First Search, and beginning at the listed source nodes, give the first path found to the listed destination nodes. For the purpose of this exercise, assume DFS prioritizes lower numbered nodes. For example, if Node 2 is connected to Nodes 3 and 4, the first path checked will be 23. Additionally, DFS will never return to a node already in its path.

To denote a path, simply list the numbers of the nodes exactly as done in the lecture.

Hint: Visual representation

You can never go wrong with drawing a picture of the problem. Here is one possible visualization. The possible permutations are denoted in the graph below. From each node, you can choose to go in either direction. In this particular depth-first-search problem, you will choose the lower numbered node over the higher numbered one, even if it will lead to a longer path from the source to the destination.



1. Source: 0

   Destination: 4

   014 ✔

2. Source: 4

   Destination: 1

   41 ✔

3. Source: 1

   Destination: 1

   1 ✔

4. Source: 2

   Destination: 4

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5. Source: 2

Destination: 3

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