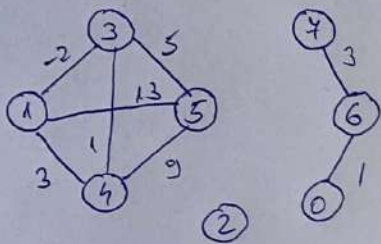


Find the connected components of a graph (undirected) using DFS  
 • Manual exec. 1 (3 connected components with 1 isolated node)

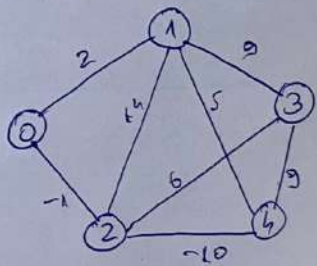


Neighbours dictionary  
 Key Value

|   |   |           |
|---|---|-----------|
| 0 | — | [6]       |
| 1 | — | [3, 4, 5] |
| 2 | — | [ ]       |
| 3 | — | [1, 4, 5] |
| 4 | — | [1, 3, 5] |
| 5 | — | [1, 3, 4] |
| 6 | — | [0, 7]    |
| 7 | — | [6]       |

|                | x | y | Stack             | acc          | visited     | Com. component |
|----------------|---|---|-------------------|--------------|-------------|----------------|
| call<br>dfs(0) | 0 | 6 | top: [0]          | {0}          | vis[0]=True |                |
|                | 6 | 4 | top: [6, 0]       | {0, 6}       | vis[6]=True |                |
|                | 4 |   | top: [7, 6, 0]    | {0, 6, 7}    | vis[7]=True |                |
| call<br>dfs(1) | 1 | 3 | top: [1]          | {1}          | vis[1]=True |                |
|                | 3 | 4 | top: [3, 1]       | {1, 3}       | vis[3]=True |                |
|                | 4 | 5 | top: [4, 3, 1]    | {1, 3, 4}    | vis[4]=True |                |
|                | 5 |   | top: [5, 4, 3, 1] | {1, 3, 4, 5} | vis[5]=True |                |
| call<br>dfs(2) | 2 |   | top: [2]          | {2}          | vis[2]=True |                |
|                |   |   |                   |              |             |                |

• Manual exec. 2 (1 connected component)



Neighbours - dict.  
key value

|   |                   |
|---|-------------------|
| 0 | - [1, 2]          |
| 1 | - [0, 1, 2, 3, 4] |
| 2 | - [0, 1, 3, 4]    |
| 3 | - [1, 2, 4]       |
| 4 | - [1, 2, 3]       |

|                | x | y | Stack  | acc             | visited       | Com. comp. |
|----------------|---|---|--|-----------------|---------------|------------|
| call<br>dfs(0) | 0 | 1 | top: <span style="border: 1px solid black; padding: 2px;">0</span>         | {0}             | vis[0] = True |            |
|                | 1 | 2 | top: <span style="border: 1px solid black; padding: 2px;">1 0</span>       | {0, 1}          | vis[1] = True |            |
|                | 2 | 3 | top: <span style="border: 1px solid black; padding: 2px;">2 1 0</span>     | {0, 1, 2}       | vis[2] = True |            |
|                | 3 | 4 | top: <span style="border: 1px solid black; padding: 2px;">3 2 1 0</span>   | {0, 1, 2, 3}    | vis[3] = True |            |
|                | 4 |   | top: <span style="border: 1px solid black; padding: 2px;">4 3 2 1 0</span> | {0, 1, 2, 3, 4} | vis[4] = True |            |