

```
1 import numpy as np
2 class Graph:
3     def __init__(self,vertices):
4         self._adjMat = np.zeros((vertices, vertices))
5         self._vertices = vertices
6         self._visited = [0] * vertices
7
8     def insert_edge(self,u,v,w=1):
9         self._adjMat[u][v] = w
10
11    def delete_edge(self,u,v):
12        self._adjMat[u][v] = 0
13
14    def get_edge(self,u,v):
15        return self._adjMat[u][v]
16
17    def vertices_count(self):
18        return self._vertices
19
20    def edge_count(self):
21        count = 0
22        for i in range(self._vertices):
23            for j in range(self._vertices):
24                if not self._adjMat[i][j] == 0:
25                    count += 1
26        return count
27
28    def indegree(self,u):
29        count = 0;
30        for i in range(self._vertices):
31            if not self._adjMat[i][u] == 0:
32                count += 1
33        return count
34
35    def outdegree(self,u):
36        count = 0;
37        for i in range(self._vertices):
38            if not self._adjMat[u][i] == 0:
39                count += 1
40        return count
41
42    def display(self):
43        print(self._adjMat)
44
45    def DFS(self, source):
46        if self._visited[source] == 0:
47            print(source, end=' - ')
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```
48         self._visited[source] = 1
49         for j in range(self._vertices):
50             if self._adjMat[source][j] == 1 and self.
               _visited[j] == 0:
51                 self.DFS(j)
52
53 G = Graph(7)
54 G.insert_edge(0,1)
55 G.insert_edge(0,5)
56 G.insert_edge(0,6)
57 G.insert_edge(1,0)
58 G.insert_edge(1,2)
59 G.insert_edge(1,5)
60 G.insert_edge(1,6)
61 G.insert_edge(2,3)
62 G.insert_edge(2,4)
63 G.insert_edge(2,6)
64 G.insert_edge(3,4)
65 G.insert_edge(4,2)
66 G.insert_edge(4,5)
67 G.insert_edge(5,2)
68 G.insert_edge(5,3)
69 G.insert_edge(6,3)
70 G.DFS(0)
71
72
73
```