# M Graph Coloring Problem:

class Graph:  
  
 def \_\_init\_\_(self, vertices):  
 self.V = vertices  
 self.graph = [[0 for column in range(vertices)] \  
 for row in range(vertices)]  
  
 def isSafe(self, v, colour, c):  
 for i in range(self.V):  
 if self.graph[v][i] == 1 and colour[i] == c:  
 return False  
 return True  
  
 def graphColourUtil(self, m, colour, v):  
 if v == self.V:  
 return True  
  
 for c in range(1, m + 1):  
 if self.isSafe(v, colour, c):  
 colour[v] = c  
 if self.graphColourUtil(m, colour, v + 1):  
 return True  
 colour[v] = 0  
  
 def graphColouring(self, m):  
 colour = [0] \* self.V  
 if self.graphColourUtil(m, colour, 0) is None:  
 print("\nSorry, Solution didn't Exist for this Graph !")  
 return False  
  
 # Print the solution  
 print("Solution exist and Following are the assigned colours: ")  
  
 for c in colour:  
 print(c),  
 return True  
  
  
# Driver Code  
g = Graph(8)  
g.graph = [[0, 1, 1, 0, 0, 0, 0, 0], [1, 0, 1, 1, 0, 0, 0, 0], [1, 1, 0, 1, 1, 1, 0, 1], [0, 1, 1, 0, 1, 0, 0, 0],  
 [0, 0, 1, 1, 0, 1, 1, 0], [0, 0, 1, 1, 1, 0, 1, 1], [0, 0, 0, 0, 1, 1, 0, 1], [0, 0, 1, 0, 0, 1, 1, 0]]  
m = 3  
g.graphColouring(m)