Program:

class Graph:

def \_\_init\_\_(self, vertices):

self.V = vertices

self.matrix = [[0]\*vertices for \_ in range(vertices)]

self.adj\_list = [[] for \_ in range(vertices)]

def add\_edge(self, u, v):

self.matrix[u][v] = 1

self.matrix[v][u] = 1

self.adj\_list[u].append(v)

self.adj\_list[v].append(u)

def print\_matrix(self):

print("Adjacency Matrix:")

print(" ", end="")

for i in range(self.V):

print(f"{i} ", end="")

print()

for i in range(self.V):

print(f"{i}: ", end="")

for j in range(self.V):

print(f"{self.matrix[i][j]} ", end="")

print()

def print\_list(self):

print("Adjacency List:")

for i, neighbors in enumerate(self.adj\_list):

print(f"{i}: {' '.join(map(str, neighbors))}")

g = Graph(5)

edges = [(0,1), (0,4), (1,2), (1,3), (1,4), (2,3), (3,4)]

for u, v in edges:

g.add\_edge(u, v)

g.print\_matrix()

print()

g.print\_list()

output:

Adjacency Matrix:

0 1 2 3 4

0: 0 1 0 0 1

1: 1 0 1 1 1

2: 0 1 0 1 0

3: 0 1 1 0 1

4: 1 1 0 1 0

Adjacency List:

0: 1 4

1: 0 2 3 4

2: 1 3

3: 1 2 4

4: 0 1 3