



ATMA RAM SANATAN DHARM COLLEGE

Course Title:

Discrete Mathematical Structure
Practical

Submitted To:

Shalini Ma'am

Faculty Of Computer Science

Submitted By:

Name : Sudeep Kumar Singh

Roll No. : 22/28021

Course : B.Sc. Computer Science Hons.

6. Write a Program to check if a given graph is a complete graph. Represent the graph using the Adjacency Matrix representation.

Code:

```
7.py > ...
1  # defining the is_complete_graph function with two parameters graph and num_vertices.
2  def is_complete_graph(graph, num_vertices):
3      for i in range(num_vertices):
4          # Check if each vertex is connected to all other vertices
5          for j in range(num_vertices):
6              if i != j and graph[i][j] != 1:
7                  return False
8      return True
9
10 def main():
11     graph = []
12     num_vertices = int(input("Enter the no. of vertices present in graph: "))
13     print()
14     # taking input for graph in adjacency matrix form
15     for i in range(num_vertices):
16         rows = []
17         for j in range(num_vertices):
18             cell = int(input(f"Enter the value of {i,j}: "))
19             rows.append(cell)
20         graph.append(rows)
21
22     print('\nAdjacency matrix representation:')
23     print(f'{graph}\n')
24
25     if(is_complete_graph(graph, num_vertices)):
26         print('It is complete graph')
27     else:
28         print('It is not complete graph')
29
30 if __name__ == "__main__":
31     main()
```

Output: For complete graph

```
PS C:\Users\Sudeep\OneDrive - RAJDHANI COLLEGE\Desktop\DSA> & C:/U
DSA/7.py"
Enter the no. of vertices present in graph: 3

Enter the value of (0, 0): 0
Enter the value of (0, 1): 1
Enter the value of (0, 2): 1
Enter the value of (1, 0): 1
Enter the value of (1, 1): 0
Enter the value of (1, 2): 1
Enter the value of (2, 0): 1
Enter the value of (2, 1): 1
Enter the value of (2, 2): 0

Adjacency matrix representation:
[[0, 1, 1], [1, 0, 1], [1, 1, 0]]

It is complete graph
```

Output: For not-complete graph

```
PS C:\Users\Sudeep\OneDrive - RAJDHANI COLLEGE\Desktop\DSA> & C:\DSA/7.py"
```

```
Enter the no. of vertices present in graph: 4
```

```
Enter the value of (0, 0): 0
```

```
Enter the value of (0, 1): 1
```

```
Enter the value of (0, 2): 1
```

```
Enter the value of (0, 3): 1
```

```
Enter the value of (1, 0): 1
```

```
Enter the value of (1, 1): 0
```

```
Enter the value of (1, 2): 0
```

```
Enter the value of (1, 3): 1
```

```
Enter the value of (2, 0): 1
```

```
Enter the value of (2, 1): 1
```

```
Enter the value of (2, 2): 0
```

```
Enter the value of (2, 3): 1
```

```
Enter the value of (3, 0): 1
```

```
Enter the value of (3, 1): 1
```

```
Enter the value of (3, 2): 1
```

```
Enter the value of (3, 3): 0
```

```
Adjacency matrix representation:
```

```
[[0, 1, 1, 1], [1, 0, 0, 1], [1, 1, 0, 1], [1, 1, 1, 0]]
```

```
It is not complete graph
```