**Department Of Computer Science and Engineering**

**CGU, ODISHA**



**DATA STRUCTURES LAB MANUAL**

**Subject Code:** **Semester: 2nd**

**Course Category:** LAB **Contact hours: 03Hrs/Week**

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| **Week-8: Graph** | |
| **SL.No.** | **Experiments** |
| 1. | WAP to construct a graph as shown in the figure.     * Implement the graph using adjacency matrix. * Implement the graph using adjacency list. * Which of the implementations is taking less space in memory? List out the memory taken by the above two implementations. * Count the number of vertices and edges of the graph by a program/function. |
| 2. | WAP to construct a graph as shown in the figure.     1. Which data structure have you preferred for implementation? Justify. 2. Search the node containing the value X. 3. Which search is preferred in the previous question? [Hint: BFS or DFS] 4. List out all the neighbors of the node found in the previous question. |
| 3. | WAP to construct a graph as shown in the figure.    (You may label the node names as per your convenience)   1. Count the number of nodes which are nuclear points. A nuclear point is defined as a node having only one neighbour. 2. Which search is better to find the nuclear points? [Hint: BFS or DFS] 3. Delete a node having at least two neighbours. Do we need to apply a searching methodology? 4. Delete a node having exactly two neighbours and situated on the north side. Is the graph still a connected component? If not then which types of nodes are at a risk to make the graph into several connected components. |
| 4. | There are 10 persons are living in a locality of a city. Those persons are of almost the same age. So, there are several friendships among themselves but not all are friends to each other directly. In order to define the relationships, the person names are labeled as A, B, C, D, E, F, G, H, I, J. The friendships are defined as follows: A-C, A-D, A-H, B-I, B-J, C-D, C-G, C-H, D-F, D-G, E-F, G-H. Suppose a soap company wants to promote their product in that locality. Hence, they want to know if there are any friendship groups so that they will promote combinedly. Now, can you use any graph techniques to know how many groups are present? |