PUNE INSTITUTE OF COMPUTER TECHNOLOGY

INFORMATION TECHNOLOGY

ACADEMIC YEAR -2020_21

SUB: DSA 2019 course   Semester – I

DSFL ASSIGMENT NO 8 WRITUP OUTLINE

1	**Title**	Assignment 8: Shortest Path finding
2.	**Aim**	To implement Shortest path using Dijikstras Algorithm
3.	**Problem statement**	Represent a graph of city using adjacency matrix /adjacency list. Nodes should represent the various landmarks and links should represent the distance between them. Find the shortest path using Dijkstra's algorithm from single source to all destination. Analyse the implemented algorithm for space and time complexity
4.	**Objective**	
5.	**Outcome**	
6.	**Theory**	**C. Theory ::** 1. What is shortest path 2. Applications and real time use cases of shortest path 3. List done various algorithm to find shortest path 4. write in brief about greedy approach 5. Discuss about Dijikstras 7. Real time use cases of Dijikstras
7.	**Algorithms /Pseudocode:**	Write down the pseudocode for the, explain the and trace the algorithms with appropriate example 1. Dijikstras single source to multiple definition Variations can be done easily by the students just minor modification in the algorithm and can rewrite the algorithm /mention the stepwise changes to implement following : 1. single source to single destination 2. Multiple source to multiple destination
8.	**Test cases/validation**	**Test cases :** 1. consider directed graph , with no loop, parallel edges 2. Test for undirected graph with no loop ,parallel edges **Validations :** 1. no of Vertex and no of edges are positive integer no. 1. Test for –ve weight
09	**Program**	Printout /Softcopy
10.	**Results /output**	Including test cases , validations and valid inputs based results .
11.	**Conclusion**	1. Write down the Space and time analysis of single source to multiple destination 2. Write down the difference MST and Shorttest path

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