

# ***HUFFMAN HIGHWAYS***

***END-TERM***

*BY-*

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# ***TOPICS LEARNT***

- BASICS OF C++/STL
- BINARY SEARCH
- STRINGS ,LINKED LISTS
- STACK, QUEUE,HEAP DATA STRUCTURES
- OOP (OBJECT ORIENTED PROGRAMMING)
- GRAPH ALGORITHMS
- TREE
- HUFFMAN DATA COMPRESSION/DECOMPRESSION
- DYNAMIC PROGRAMMING
- SHORTEST PATH PROBLEMS AND THEIR APPLICATIONS IN REAL LIFE

# ***ALGORITHM USED BY ME:***

- I HAVE USED DIJKSTRA'S ALGORITHM IN MY CODE TO FIND THE SHORTEST PATH BETWEEN TWO NODES IN THE GRAPH
- THE CODE PRECOMPUTES THE GRAPH BY USING THE DATA GIVEN IN THE PROJECT , I FIRST ADDED ALL THE EDGES AND NODES MANUALLY.
- NOW, MY CODE TAKES INPUT OF THE SOURCE AND DESTINATION VERTICES AND THEN EXECUTES DIJKSTRA WITH THE SOURCE VERTEX
- WE NEED TO ALSO RECONSTRUCT THE PATH WHICH RESULTS IN THE SHORTEST PATH, FOR THIS I MAINTAIN A PARENT ARRAY WHICH IS UPDATED SIMULTANEOUSLY WHILE UPDATING THE SHORTEST DISTANCE FOR EACH NODE.
- TRAVERSING BACKWARDS IN THE PARENT ARRAY FROM DESTINATION TO SOURCE, WE GET THE REQUIRED PATH.