Contents

Greedy Approach:

- Bin Packing Algorithm
- Huffman Coding

Dynamic Programming (DP) Approach:

- Longest Increasing Subsequence (LIS)
- Longest Common Subsequence (LCS)

Sorting Techniques:

- Bubble Sort
- Quick Sort
- Selection Sort
- Merge Sort
- Insertion Sort

Graph Theory:

- Depth-First Search (DFS)
- Breadth-First Search (BFS)
- Topological Sort (TS)
- Strongly Connected Components (SCC)
- Prim's Algorithm
- Kruskal's Algorithm
- **Dijkstra's algorithm**

1.Greedy Approach:

1.1Bin packing Algorithms:

https://youtu.be/e8ZTYp4T0xo?si=SvYprvGXcE9UDU4N

- **problem: Pack the weights 5, 7, 3, 5, 6, 2, 4, 4, 7, and 4 into bins with capacity 10**

1.2.Huffman coding:

https://youtu.be/7HrfRv5gHz0?si=0eFyYJ9JDC2BTCg6

- **problem:**

Character	Frequency
m	1
p	2
s	4
i	4

2.Dynamic programming:

2.1Longest Increasing Subsequence(LIS):

https://youtu.be/xOwMYlZLAO4?si=FcyicqYglFzuaiJ4

Problem:

Longest Increasing Subsequence : Given an array A, find the longest increasing subsequence (LIS).

Examples: A: [10, 20, 2, 5, 3, 8, 8, 25, 6]

2.2ongest Common Subsequence:

https://youtu.be/6Q_4mwOwiC0?si=E_Jw13tjRSliUY8A

Problem:

Input: S1 = "AGGTAB", S2 = "GXTXAYB"

3.Sorting Technique:

3.1Bubble Sort: https://youtu.be/PbbC4FZQia4?si=pZPibtCvzH-zPri7

3.2Quick Sort: https://youtu.be/9eQKdnQRv1k?si=4dBA4E0O4IBn87rX

3.3Merge Sort: https://youtu.be/CM4uV1vLWow?si=55W66Uj2QEOT6sVD

3.4Selection Sort: https://youtu.be/epHw58Kz0Pg?si=sKWfJq6XTsUfZvIY

3.5 Insertion Sort: https://youtu.be/iQNZAOw67zM?si=4_iuzn9ftIBIZ0uj

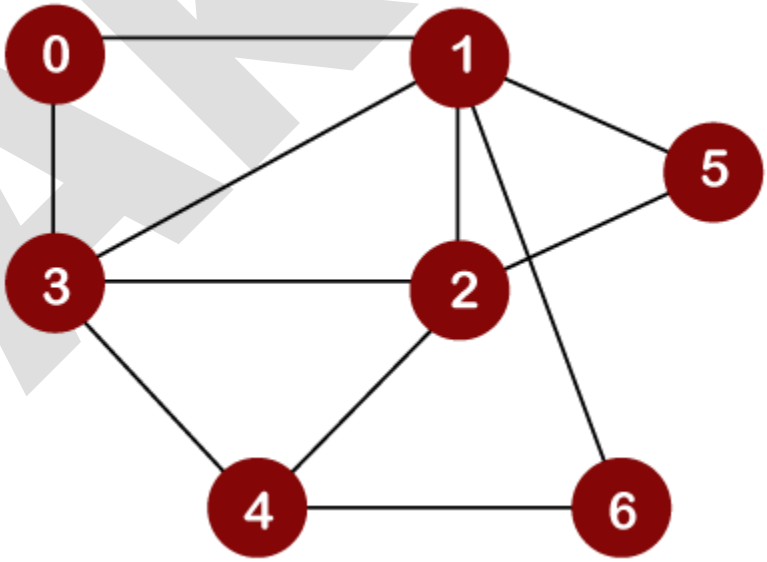
Problem: Comparison of sorting algorithms

4.Graph Theory

4.1BFS and DFS: https://youtu.be/bgLecRSOWNM?si=pJ0Id73KCgNmVcXo

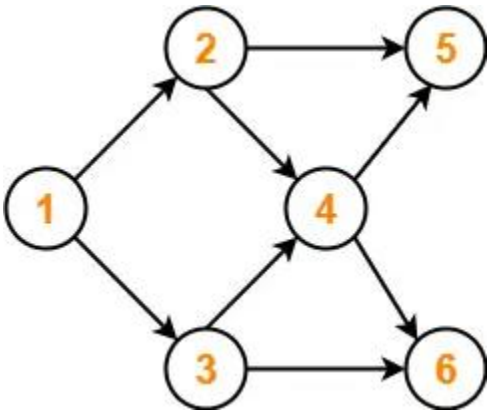
https://youtu.be/5Z7tnNZj7FY?si=NJlSmHtDW-AUVPqj

Problem: Apply Bfs and Dfs in this Graph



4.2Topological Sort:
https://youtu.be/3tkcfvCNtM8?si=YVH0PEQLke27ko2I

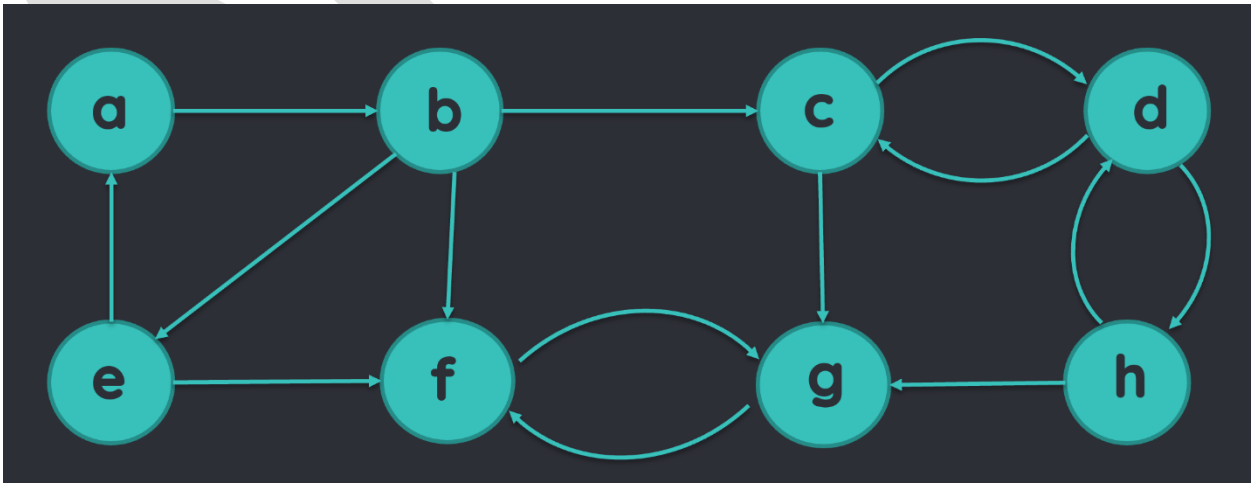
Problem:



4.3Strongly Connected Components:
https://drive.google.com/file/d/1DISyIiEqQBU1IKc5AdniW9MILkkTPXp-/view?usp=drivesdk

(only DIU mail)

Problem:



4.4Prims Algorithm:

Basic: https://youtu.be/CuB3-dmiSL0?si=rwLcTMtuFn9ss5d-

After: https://youtu.be/KwYMYX0a73k?si=TDmdpZAQCxVV4x-2

4.5 Kruskal Algorithm: https://youtu.be/Qt0tUIzoj8k?si=tjTjI1p1XY_F3Niz

4.6 Dijkstra algorithm:

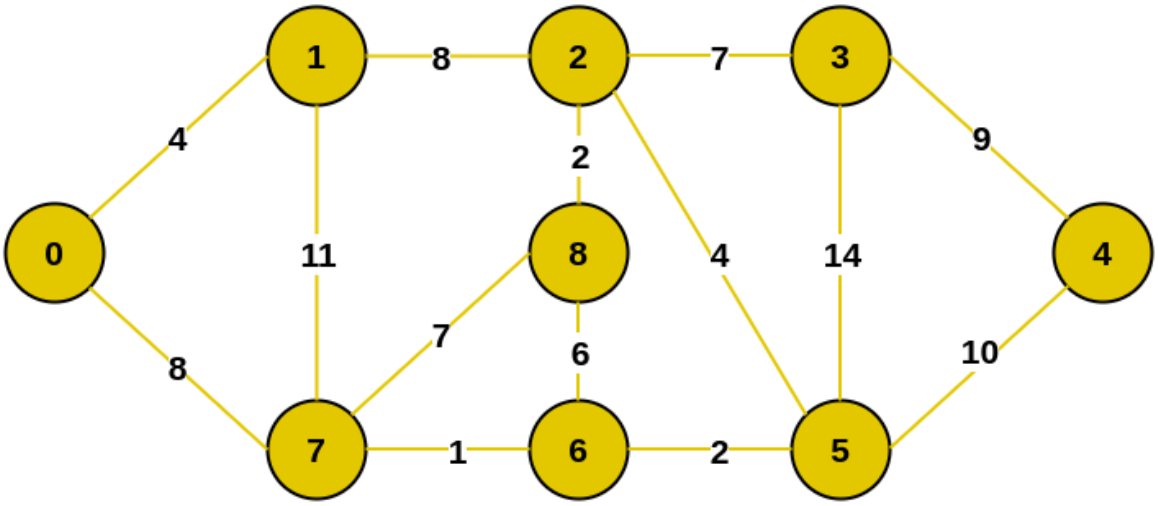
for Undirected graph

https://youtu.be/bHolUy5sqq8?si=SdxmLSG1PhI7V_Wc

for Directed graph

https://youtu.be/p0MUtpaw1ks?si=ES2wNi_CJ4DPA5ns

Problem:



Example of a Graph

"Zindagi Ne Zindagi Bhar Gham Diye"