DESIGN & ANALYSIS OF ALGORITHM

PCC-CS501

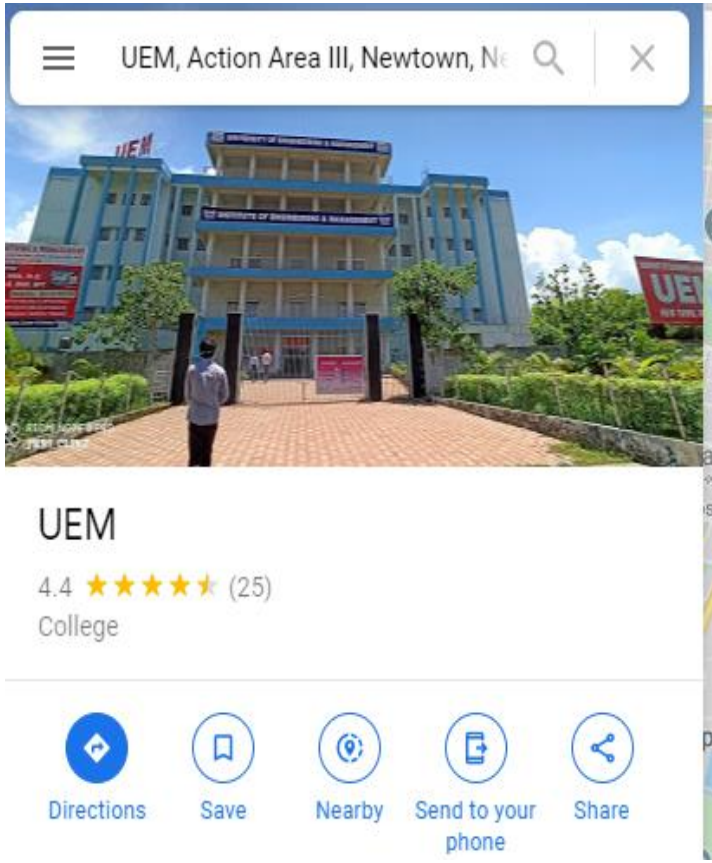
DESIGN & ANALYSIS OF ALGORITHM
SCHEDULE ----TOPIC WISE

	Topic	Sub Topic
1	INTRODUCTION	DESIGN OF ALGORITHM ,ANALYSIS OF ALGORITHM, ALGORITHM PROPERTIES
2	FRAMEWORK FOR ALGORITHM ANALYSIS	HOW TO COUNT EXECUTION TIME OF ALGORITHM,INPUT INSTANCES
3	ASYMPTOTIC NOTATION	BEST CASE,AVERAGE CASE, WORST CASE
4	SOLVING RECURRENCE RELATION	SUBSTITUTION METHOD, MASTER THEOREM
5	ALGORITHM DESIGN TECHNIQUES	DIVIDE & CONQUER, GREEDY,DYNAMIC PROGRAMMING, BACKTRACKING,
6	DISJOINT SET MANIPULATION	UNION FIND
7	NETWORK FLOW PROBLEM	FORD FULKERSON ALGORITHM
8	NP COMPLETENESS	NP,NP HARD……ALGORITHM
9	APPROXIMATION ALGORITHM	COMPLEXITY ANALYSIS OF NP COMPETE PROBLEM

DIJKSTRA ALGORITHM

- SINGLE SOURCE SHORTEST PATH ALGORITHM

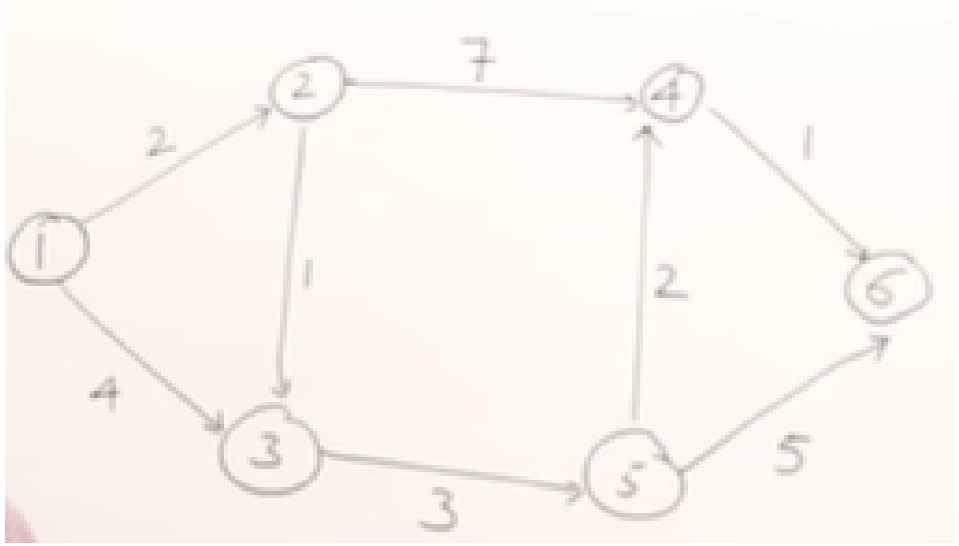
SINGLE SOURCE SHORTEST PATH ALGORITHM

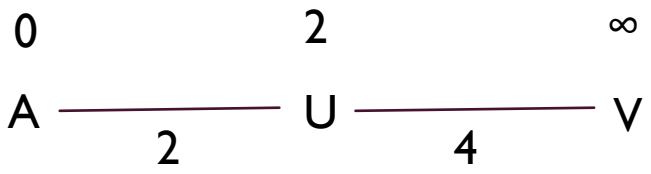


DIJKSTRA ALGORITHM

RULE OF RELAXATION

- Applicable on directed / undirected graph
- Optimization Problem
- Rule of Relaxation

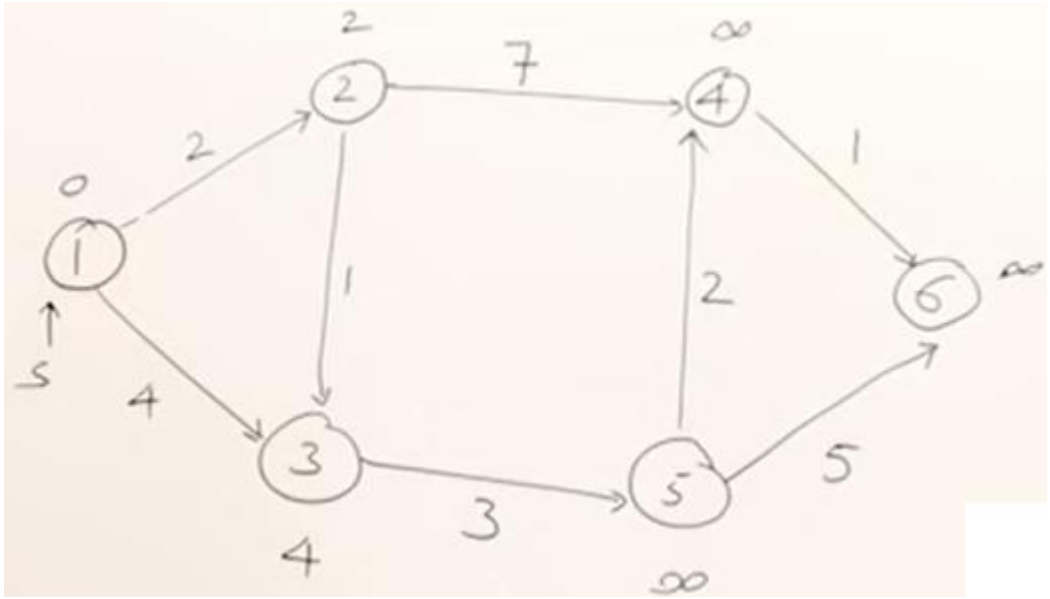




IF (d[U]+C[U,V]) < d[V]) THEN
SET d[V] ← d[U]+C[U,V]

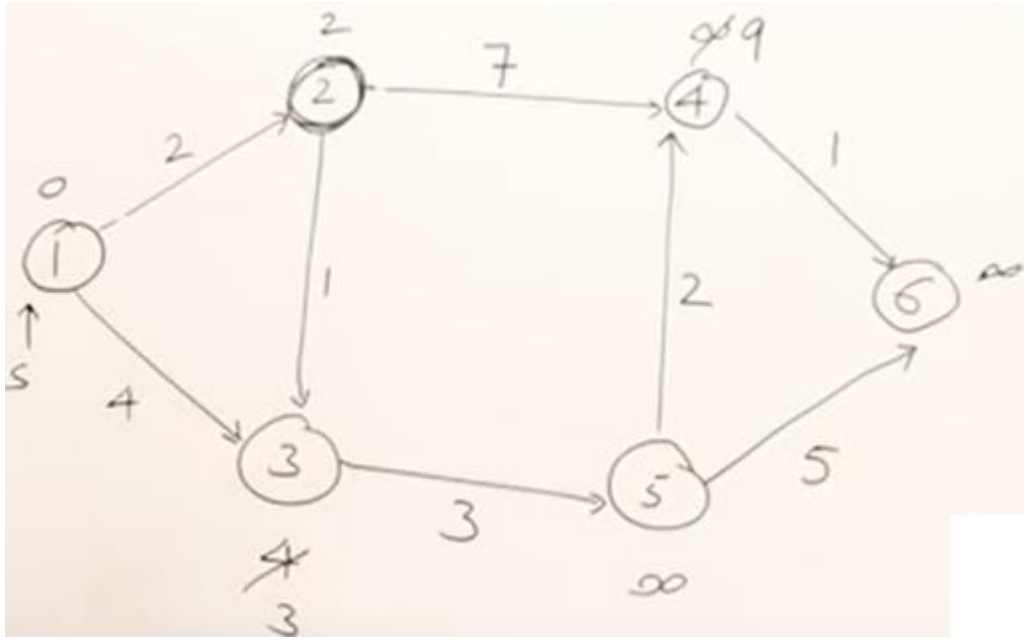
DIJKSTRA ALGORITHM

- Start vertex : 1



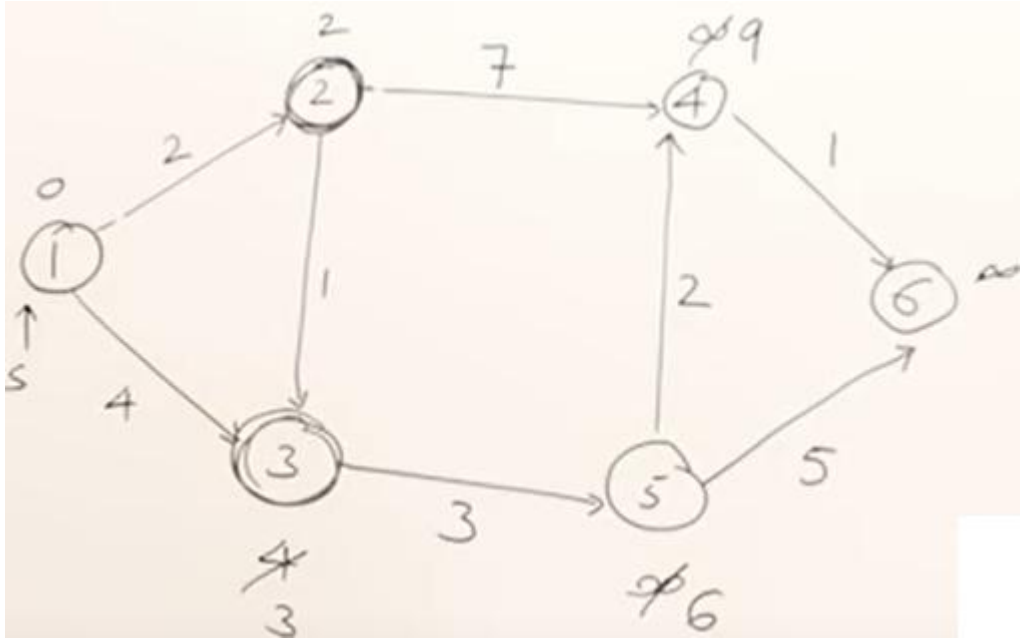
DIJKSTRA ALGORITHM

- 1 → 2



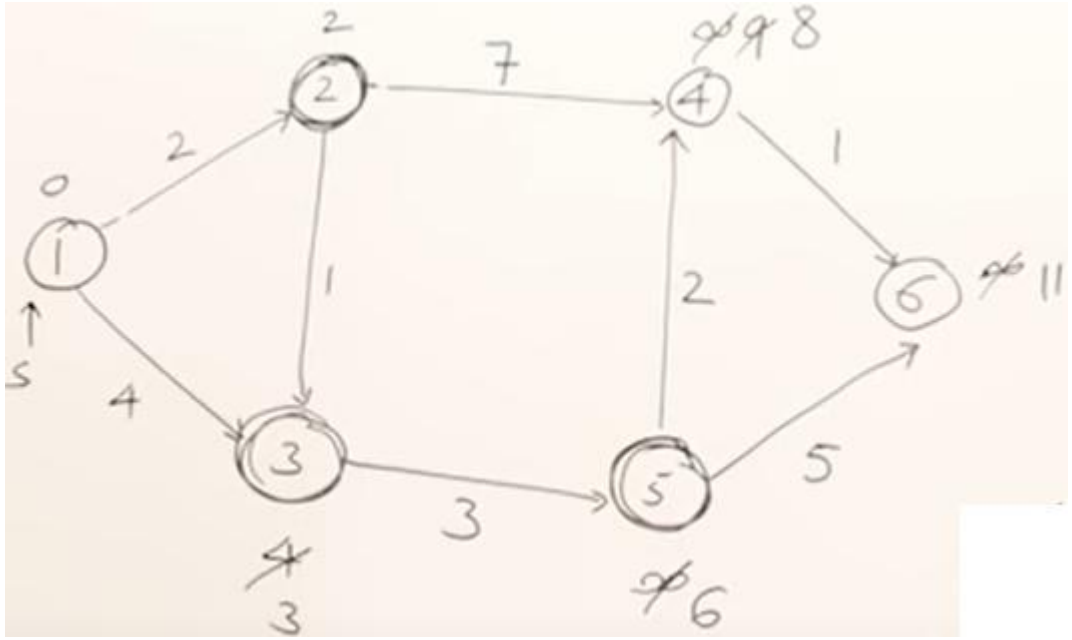
DIJKSTRA ALGORITHM

1 → 2→ 3



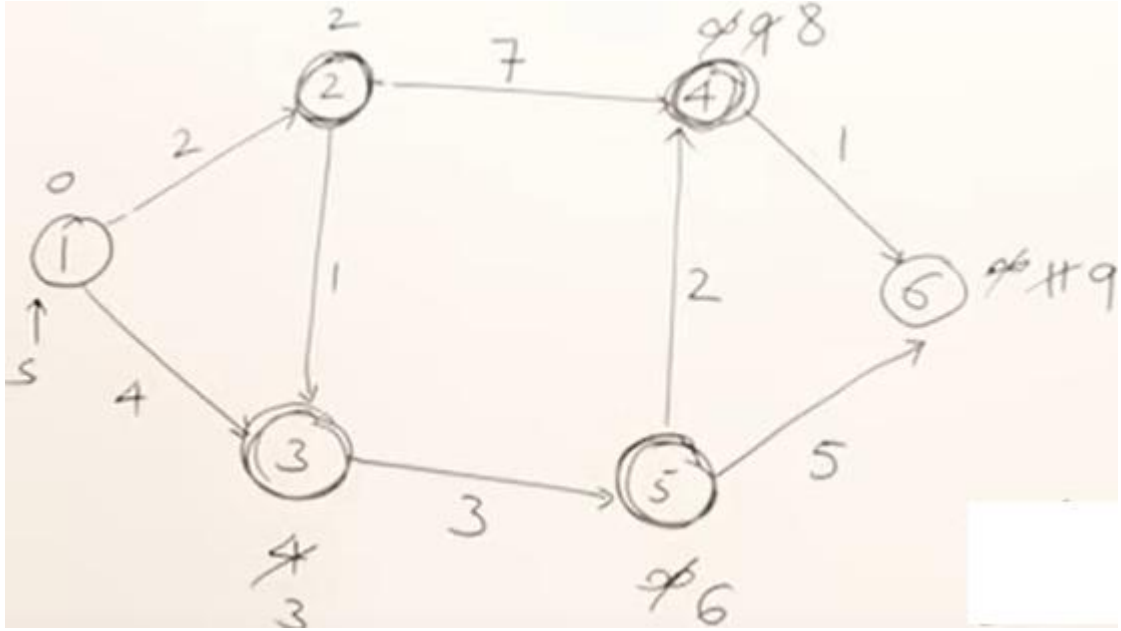
DIJKSTRA ALGORITHM

1 → 2→ 3→5



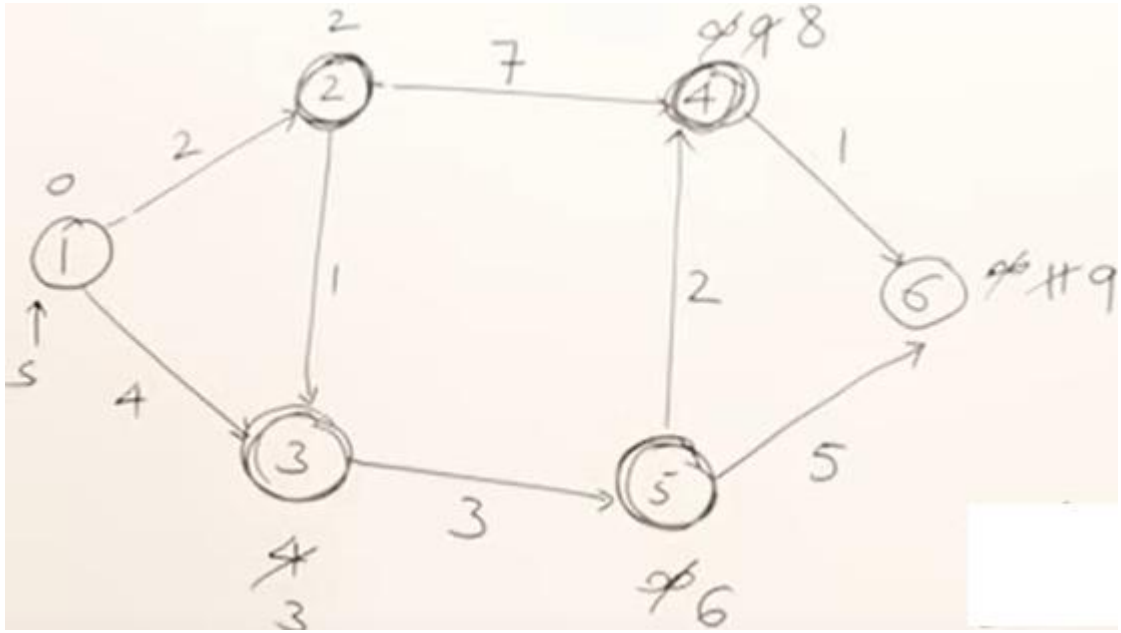
DIJKSTRA ALGORITHM

- 1 → 2→ 3→5→4



DIJKSTRA ALGORITHM

1 → 2→ 3→5→4→6



	2	3	5	4	6
Shortest Distances	2	3	6	8	9

TIME COMPLEXITY

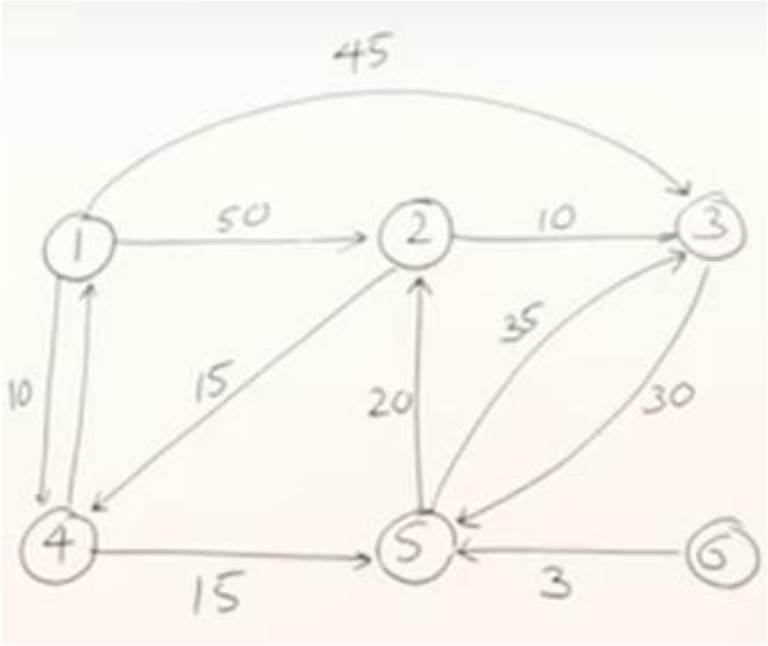
DIJKSTRA ALGORITHM

- O(V^2) or O(n^2)

[relaxation w.r.t all the adjacent vertices in case of complete graph]

DIJKSTRA ALGORITHM

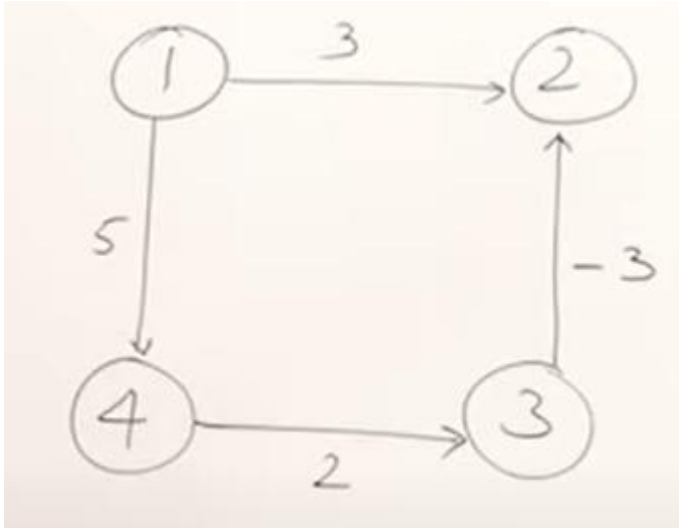
Selected virtex	2	3	4	5	6
4	50	45	10	∞	∞
5	50	45	10	25	∞
2	45	45	10	25	∞
3	45	45	10	25	∞
6	45	45	10	25	∞

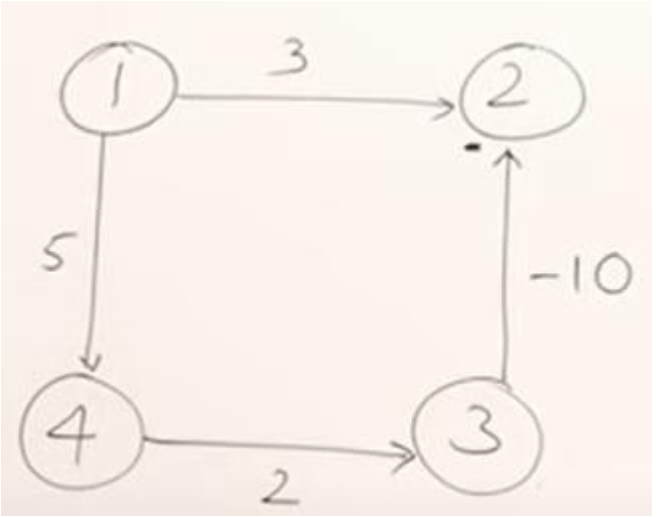


DRAWBACK

DIJKSTRA ALGORITHM

- May or May not Support Negative weight edge.





NEXT CLASS

- DYNAMIC PROGRAMMING