Exam 2 Review

1. Use a dynamic programming algorithm to compute the binary coefficient C(5, 3). Show steps.

2. A greedy solution for the Job Sequencing with Deadlines problem is to sort the jobs by their profits in nonincreasing order, then consider the jobs one at a time. Give a counterexample to show that this doesn't necessarily yield an optimal solution.

Exam 2 Review

Consider the following jobs. Use the Scheduling with Deadlines algorithm to maximize the profit. Show the values in `finalSequence` and `temp` after each step

Job	Deadline	Profit
1	2	20
2	1	50
3	3	60
4	2	25
5	5	5
6	1	45
7	2	55
8	5	5

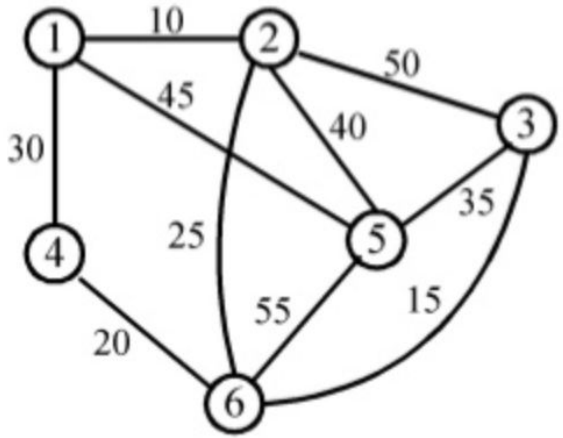
Answer

Final Sequence: [2, 7, 3, 5, 8]

Kruskal's Algorithm

Use Prim's Algorithm and Kruskal's algorithm to find a minimum spanning tree for this graph.

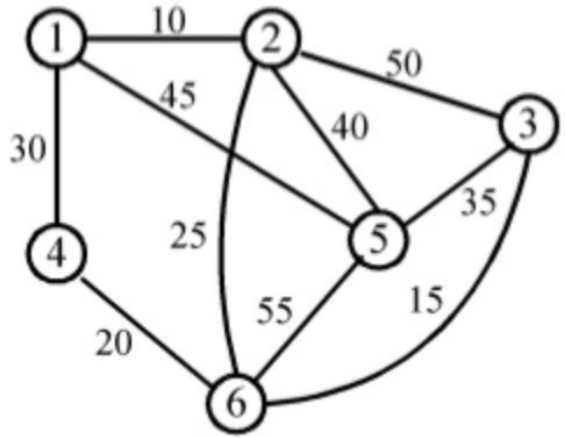
For Prim's: Show the arrays values in `nearest` and `distance` after each step.



Kruskal's Algorithm

Answer:

F= { <1, 2>, <2, 6>, <3, 6>, <4, 6>, <3, 5> }



Exam 2 Review

Given arrays of the following sizes, determine the optimal order of multiplication. Show the arrays M and P as well as your work for each step:

$$A_1 \times A_2 \times A_3 \times A_4$$

$$5 \times 3 \qquad 3 \times 4 \qquad 4 \times 6 \qquad 6 \times 5$$

Answer

P:

	1	2	3	4
1		1	1	1
2			2	3
3				3
4				

M:

	1	2	3	4
1	0	60	162	237
2		0	72	162
3			0	120
4				0

Optimal Order:
A1((A2A3)A4)

Exam 2 Review

1. Use Dijkstra's Algorithm to find the shortest path from vertex 3 to all the other vertices in the following graph. Show actions step by step.

	1	2	3	4	5	6
1	0	∞	7	1	9	3
2	∞	0	1	4	5	7
3	1	15	0	∞	7	9
4	3	2	8	0	∞	3
5	10	1	12	∞	0	2
6	2	8	9	3	8	0

Answer

Use Dijkstra's Algorithm to find the shortest path from vertex 3 to all the other vertices in the following graph. Show actions step by step.

{ <3, 1>, <1, 4>, <1, 6>, <3, 5>, <4, 2> }