DESIGN AND ANALYSIS OF ALGORITHMS
UE19CS251

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Assignment Problem

Major Slides Content: Anany Levitin

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The Assignment Problem

- There are n people who need to be assigned to n jobs, one person per job. The cost of assigning person i to job j is C[i, j]. Find an assignment that minimizes the total cost

The Assignment Problem

Example

	Job 1	Job 2	Job 3	Job 4
Person 1	9	2	7	8
Person 2	6	4	3	7
Person 3	5	8	1	8
Person 4	7	6	9	4

The Assignment Problem

Algorithmic Plan

1. Generate all legitimate assignments
2. Compute their costs
3. Select the cheapest one

The Assignment Problem

The Assignment Problem by Exhaustive Search

Assignment	Cost
1, 2, 3, 4	9 + 4 + 1 + 4 = 18
1, 3, 4, 2	9 + 8 + 9 + 7 = 33
1, 4, 3, 2	9 + 6 + 1 + 7 = 23
1, 4, 2, 3	9 + 6 + 3 + 8 = 26
1, 3, 2, 4	9 + 8 + 3 + 4 = 24
1, 2, 4, 3	9 + 4 + 9 + 8 = 30

etc.,

The Assignment Problem

Efficiency

- The Assignment Problem is solved by generating all permutations of n
- The number of permutations for a given number n is n!
- Therefore, the exhaustive search is impractical for all but very small instances of the problem

THANK YOU

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