



SNS College of Engineering, Coimbatore - 641107



Important problem types

AP/IT

Problem Types

- Sorting
- Searching
- String Processing
- Graph processing
- Combinatorial problems
- Geometrical problems
- Numerical problems

Sorting

- Rearranging the given items in ordered sequence .
- Sorting makes searching easier: dictionaries, telephone books, class lists and so on are sorted.
- Sorting algorithms: selection sort, bubble sort, merge sort, quick sort, heap sort.

Searching

- To find a given value, called a *search key*, in a *given set*.
- Searching algorithms
 - Sequential search
 - Binary search
 - Hashing
 - Tree-based searches

String Processing

- A string is a sequence of characters from an alphabet
 - Text strings
 - Bit strings
 - Gene sequences-A,C,F,T
- Algorithms:
 - Brute-force string matching
 - Huffman code

Graph Problems

- A graph is a collection of points (vertices) which are connected by lines (edges).
- Real-life applications:
 - Transportation and communication networks
 - Scheduling projects and games
 - Web's diameter.
- Algorithms for graph problems:
 - Graph traversal
 - Shortest-path problem

Break



Combinatorial problems

- Find a combinatorial object such as permutation, a combination, or a subset that satisfies certain criteria (e.g., maximize a value or minimize a cost).
- Examples:
 - Traveling salesman problem
 - Knapsack problem
 - Assignment problem
 - Graph coloring problem

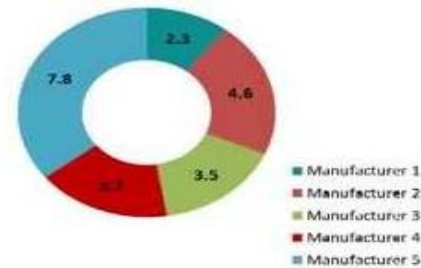
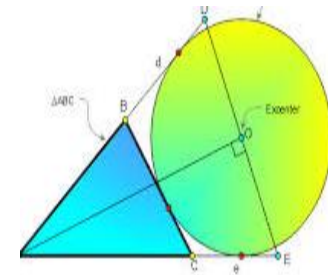
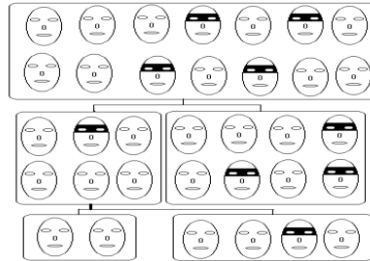
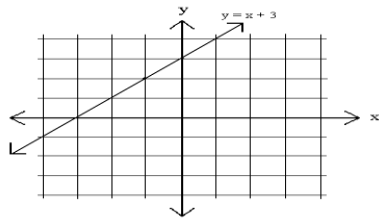
Geometric problems

- Deal with geometric objects such as points, lines, and polygons
- Interesting problems
 - Closest-pair problem
 - Convex hull
 - Brute force
 - Divide-and-Conquer methods

Numerical problems

- Large special area of applications
 - Solving equations and systems of equations
 - Computing definite integrals
 - Evaluating functions.
 - Taylor polynomial for **e^x**
 - Newton's algorithm for computing square roots.

Find the method



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Puzzle

- **ANS:** sorting, searching, string, graph, combinatorial, geometric, numerical