GeeksforGeeks

Competitive Programming

Detailed
Course Syllabus

CONTENTS

WEEK 01:

- **Introduction to Competitive Programming**
  - Understanding time complexity.
- **Introduction to Prefix Arrays**
- **Binary Search and Sorting Algorithms**
  Solving Problems on binary search and sorting.

WEEK 02:

- **Introduction to Competitive Programming**
  Prime factorization in sqrt time complexity.
- **Introduction to Sieve Algorithm and its applications.**
- **Introduction to various exponentiation techniques**
  - Binary Exponentiation
  - Modular Exponentiation
- **Introduction to Fermat's theorem and Modular inverse.**
- **Introduction to Combinatorics and Bit Manipulation.**
  Solving problems on Combinatorics and Bit Manipulation

WEEK 03:

- **Introduction to Stack, Queues, and Priority Queue**
  Solving Cp Problems based on Stack, Queues, and Priority Queues
- **Introduction to String Hashing Concepts**

WEEK 04:

- **Introduction to Recursion.**
- **Basics of Advanced to Backtracking**

WEEK 05:

- **Basics of Greedy Algorithm and Dynamic Programming**
- **Dynamic Programming**
  Solving Dp problems based on Knapsack
  Solving Dp Problems based on Combinatorics
  Solving Dp Problems based on Divide and Conquer.

CONTENTS

WEEK 06:

- **Dynamic Programming Continued**
  - Solving Dp Problems based on Digit Dp and Bitmask DP

WEEK 07:

- **Basics Graphs and Trees**
  Representation of Graphs and Trees
  DFS and BFS Traversal of Graphs and Trees

WEEK 08:

- **Solving Problems based on Dp on trees**
- **Introduction to various Shortest Path Algorithms**
- **Applications of Shortest Path Algorithms and Solving Problems on the same.**

WEEK 09:

- **Introduction to Disjoint Set Union**
  Solving Problems based on DSU.
- **Introduction to Minimum Spanning Tree**
  Solving Problems based on MST
- **Introduction to Sparse tables and Lowest Common Ancestor**
  Solving Problems based on Sparse tables and LCA.

WEEK 10:

- **Introduction to Segment trees, Problems on Segment Trees.**