Problem Solving and Programming with Python

Problem Solving Fundamentals

1. Algorithm Design and Problem Solving
    a. What is an Algorithm?
    b. Expressing Algorithms
    c. Variables and Assignments
    d. Logic Statements
    e. Loops
    f. Working with Arrays
2. Stepwise Refinement and Structure Charts
    a. Stepwise Refinement
    b. Modules
    c. Structure Charts
    d. Pseudocode from Structure Chart
3. Algorithm Design Methods
    a. Decision Tables
    b. Jackson Structured Programming (JSP)
    c. State Transition Diagrams
4. Recursion
    a. Concept of Recursion
    b. Programming a Recursive Subroutine
    c. Tracing a Recursive Subroutine
    d. Running a Recursive Subroutine
    e. Benefits and Drawbacks of Recursion

Duration: 75 Hours (2 months)

Fees: Rs.10000 (Can be paid in two instalments)

Programming with Python Fundamentals

1. What is programming? Why Python?
2. Variables: Operations and I/O
3. Conditionals and Boolean Expressions
4. Basic Program Development
5. Testing
6. Loops and Iterations
7. Files and Strings
8. Operations with Lists
9. Top-Down Design
10. Functions and Abstraction
11. Parameter Passing, Scope and Mutable Data
12. Error Types, Systematic Debugging and Exceptions
13. Python Standard Library, Modules and Packages
14. Bottom-Up Design
15. Event Driven Programming
16. Classes and Object Oriented Programming
17. Objects with Inheritance and Polymorphism
18. Data Structures: Stack, Queue, Dictionary and Set
19. Algorithms: Searching and Sorting
20. Recursion
21. Graphs and Trees
22. Metaprogramming and Decorators
23. Metaclasses
24. Generators
25. Coroutines

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