

#DAY

19

Python

Assignment Questions



Q1. What is Abstraction in OOps? Explain with an example.

Q2. Differentiate between Abstraction and Encapsulation. Explain with an example.

Q3. What is abc module in python? Why is it used?

Q4. How can we achieve data abstraction?

Q5. Can we create an instance of an abstract class? Explain your answer.

Q6, Create a vehicle class with an init method having instance variables as name_of_vehicle, max_speed and average_of_vehicle.

Q7. Create a child class car from the vehicle class created in Que 1, which will inherit the vehicle class.

Create a method named seating_capacity which takes capacity as an argument and returns the name of the vehicle and its seating capacity.

Q8. What is multiple inheritance? Write a python code to demonstrate multiple inheritance.

Q9. What are getter and setter in python? Create a class and create a getter and a setter method in this class.

Q10. What is method overriding in python? Write a python code to demonstrate method overriding.

DSA Roadmap

Problem solving skills

- Analysis → Time & Space Complexity
- Recurrence Relation Solving
- Asymptotic Analysis, Complexity classes

Array & String → 1) Two Pointers
2) Kadane's Algorithm

2D Array → 1) Matrix Computation

Important

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Recursion → Basic questions → Factorial, Divide & Conquer, Fibonacci Series

↳ Algorithms

Merge Sort, Quick Sort, Binary Search

Sorting algorithms

- Comparison Sort
 - ↳ Selection, bubble, insertion, Shell, heap
- non comparison Sort
 - ↳ Count, Radix, bucket

Searching algo

- Linear Search - $O(n)$

Binary Search *
(Applications)
 $O(\log n)$

99% Sorted
↳ Array
↳ Matrix

Linked List → Reversal
cycle detection
↳ Fast pointer & Slow pointer

Sorting algo
Modify Linked List

LIFO ↑ FIFO
Stack & Queue

- Array
- Linked List

Internal concepts & implementation

XX

Tree

- Binary Tree
 - ↳ CAT, FAT, AFBT
 - ↳ views of tree
 - ↳ Tree Traversal

BST
↳ Inorder Traversal

Heap Data Structure → K → Sorted array

Graph

- BFS & DFS (Traversal algorithms)
- Level order traversal
- Networking

Google, Facebook

Dynamic Programming → Advance version of Recursion

- ↳ LCS
- ↳ Sum of subset

XX

Hashing Data Structure
Trie

Greedy Algorithms

- Dijkstra *
- MST *

Circular Queue, Doubly linked list

Skip list

Deque

String Matching Algo

↳ competitive programming

Maths ← Bit Manipulation

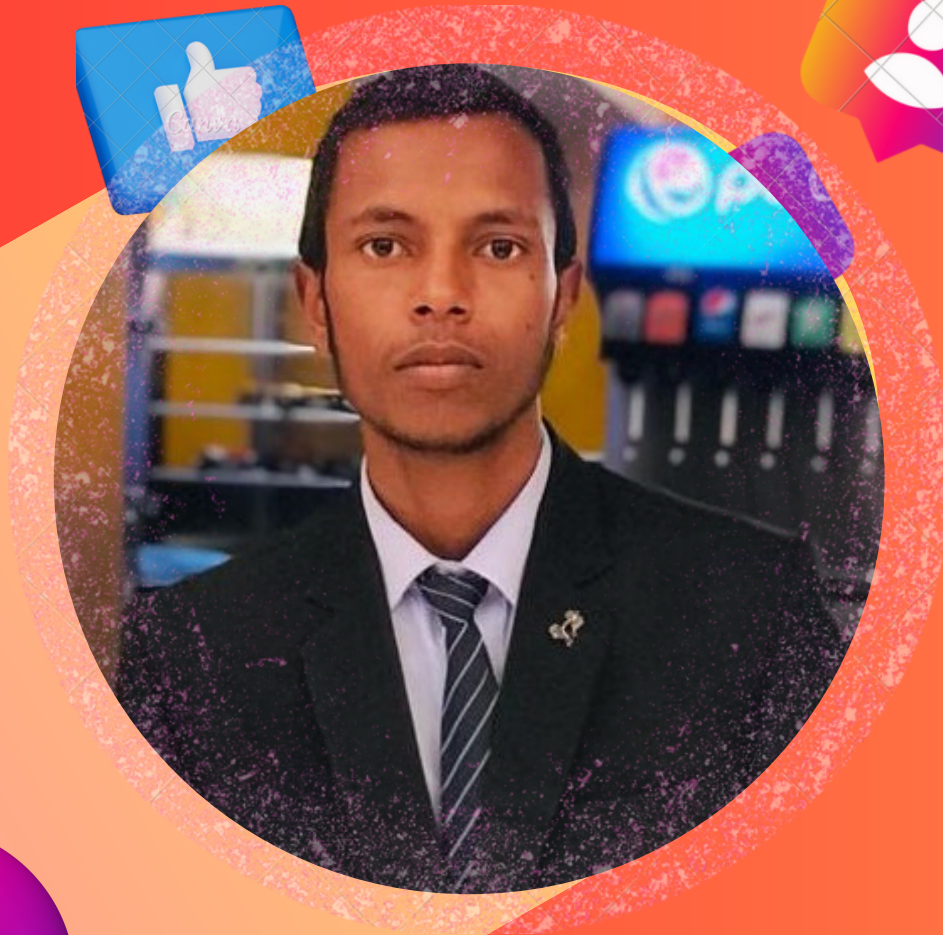
Left shift → $\times 2$

Right shift → $/2$

XX

Backtracking
↳ Recursion

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