Government Polytechnic for Girls, Surat

Dept: Information Technology

Sub: **- Data Structure with Python**

Assignment -04

Unit-04

Q.1 Define Linked List? List out types of Types of Linked List.
Q.2.Explain major operation of linked list.
Q.3.Write an algorithm to insert a node at the end of singly linked list.
Q.4.Write an algorithm to insert a node at beginning in singly linked list.
Q.5. Write an algorithm to insert a node at specified position in singly linked list.
Q.6. Write an algorithm to display of node in SLL.
Q.7. Explain single linked list node structure in python.
Q.8. Write algorithm to delete node from beginning in singly linked list.
Q.9. Write algorithm to delete node at end in singly linked list.
Q.10. Difference between single linked list and circular linked list.
Q.11. Explain advantages of linked list.
Q.12. Explain doubly linked list.
Q.13. Explain Application of Linked List.

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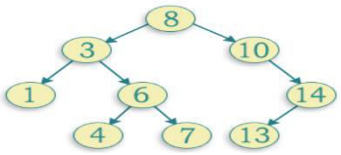
Sub: **- Data Structure with Python (4331601)**

Assignment -06(Unit-VI)

Q.1. Define Binary Tree? List out different types of tree.
Q.2. Define: **a)** Path **b)**. Height of tree **c)**.Forest **d)**. Sibling **e)**.Root **f)**.Leaf Node **g)**. Internal Node
Q.3. Write an algorithm to insert node in Binary search tree using python.
Q.4. Write an algorithm for Pre-Order Traversal of tree.
Q.5. construct a binary search tree for following data items. Also, provide **Pre- order, In-Order, Post-Order** of that tree.

25, 32, 4, 7,12,67,27,78,2

Q.6. Write an algorithm for In-Order Traversal of tree.
Q.7. Write an algorithm for post-order traversal of tree.
Q.8. Explain Application of binary tree.
Q.9. Write an algorithm to search () operation of binary search tree.
Q.10. Write an algorithm to delete node of binary search tree.
Q.11. Perform Inorder,Preorder,Postorder traversal of below given Binary search tree. Also find out indegree and outdegree of nodes.



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Sub: - Data Structure with Python (4331601)

Assignment -05

Unit-05

Q.1. Define Search? Write an algorithm for Linear search using List.

Q.2. write an algorithm for binary search using list and Solve given data **10, 30, 40,50, 60,70** for key =30.

Q.3. List out different sorting techniques.

Q.4. Write an algorithm for bubble sort. Apply selection sort to following data to arrange them in ascending order: 40, 11, -9, 18, 45, 16

Q.5. Write an algorithm for selection sort. Apply selection sort to following data to arrange them in ascending order: 4, 1, 2, 8, 7, 6

Q.6. write an algorithm for quick sort using list.

Q.7. Solve data using Quick Sort as below:

10, 6, 12, 9, 8, 2, 35,9,11

Q.8.Write an algorithm for insertion sort.

Q.9.Write an algorithm for merge sort and solve data as below: 32, 74, 89,21,55,64.

Q.10. Give trace of following numbers using Insertion sort: 200, 84, 115, 122, 405, 140

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Sub: **- Data Structure with Python (4331601)**

Assignment -03

Unit-03

Q.1 Write an algorithm for PUSH and POP operation of stack using List.

Q.2 Explain Application of stack.

Q.3 Differentiate between stack and queue.

Q.4 Write an algorithm for enqueue() and dequeue() operaton of simple queue using a List.

Q.5 Given equation to conversion from infix to postfix expression using stack.

i). (A+B)*(C-D) / E*F

Q.6 Define recursion. Explain Factorial no using recursion in python.

Q.7 Evaluate Postfix expression.

P : 12, 7, 3, -, /, 2, 1, 5, +, *, +

Q.8. write an algorithm for infix to postfix expression.

Q.9.Explain disadvantages of Stack.

Q.10. Differentiate between simple queue and circular queue.

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Sub: **- Data Structure with Python (4331601)**

Assignment -02

Unit -02(OOP)

Q.1. Explain class in python with suitable example.

Q.2. List out types of constructors in python. Explain parameterized constructor with example.

Q.3. Explain advantages of OPP with python.

Q.4. Write a python program to find the area of a rectangle using classes and object.

Q.4. Define Data Encapsulation ? Explain need of data encapsulation?

Q.5.Explain Access modifier in python with suitable example.

Q.6. Define Inheritance? List out types of inheritance?

Q.7. Explain single inheritance with suitable example.

Q.8. Write a python program to multilevel inheritances.

Q.9. Differentiate between multiple vs multilevel inheritance.

Q.10 Explain class method with suitable example?

Q.11. Explain Polymorphism with suitable example.

Q.12.Write a Python program to demonstrate method overriding using inheritance.

Q.13. Explain abstract class in python with suitable example?

Q.14. Difference between class method and instance method in OOP.

Q.15. Explain advantages of inheritance in OOP.

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Sub: **- Data Structure with Python (4331601)**

Assignment -01

Unit -01

Q.1. Define DS? Explain Classification of data structures.
Q.2. Define Following Terms: a). Data b).File c).Field d). Record
Q.3. Define Time complexity and space complexity.
Q.4. List out asymptotic notations?
Q.5. Define List? Explain any four methods with suitable example.
Q.6. Write python program to turn every item of 1D array into its square.
Q.7. Explain any three dictionary methods with suitable example.
Q.8. Write a Python program to check whether a given key already exists in a dictionary.
Q.9. List out operations of array in python.
Q.10 Define Numpy array. Explain attributes of numpy array with suitable example.
Q.11 Differentiate between Array and List.
Q.12. List out operation of Tuple.
Q.13. Define set in python? Explain symmetric difference operation with suitable example.