Experiment – 6: Inheritance and Linked List

Aim: To demonstrate inheritance and Linked list in python.

Theory:

Inheritance allows to create a hierarchy of classes that share a set of properties and methods by deriving a class from another class. Inheritance is the capability of one class to derive or inherit the properties from another class. It provides the reusability of a code. Different types of Inheritance are:

- Single inheritance: When a child class inherits from only one parent class, it is called single inheritance.
- Multiple inheritances: When a child class inherits from multiple parent classes, it is called multiple inheritances.
- Multilevel inheritance: When a child class is derived from another child class it is known as multilevel inheritance.
- Hierarchical inheritance More than one derived class are created from a single base.
- Hybrid inheritance: This form combines more than one form of inheritance. Basically, it is a blend of more than one type of inheritance.

A ***linked list*** is a linear data structure that includes a series of connected nodes. Linked lists can be of multiple types:

- Singly: Each node has data and a pointer to the next node.
- Doubly: Pointer for the previous node is added and thus it can traverse in forward as well as backward direction.
- Circular: The last element is linked to the first element.

Linked List allows Dynamic memory allocation and can be used in the Implementation of stack and queue.

Conclusion:

Task for submission:

(Write comments for every statement of the program)

1. Write a program to demonstrate single inheritance to calculate cube of a number.
2. Write a program to demonstrate inheritance to find the area of various shapes
3. Write a program to demonstrate addition of two numbers using multiple inheritance
4. Write a program to insert a node in the middle of a linked list.
5. Explain the difference between pop( ), push( ) and peek( ).
6. Write a program to implement stack data structure using linked list in python using Last In First Out technique.