Question 7: Generating Numbers from 1 to 100 Write Java or Python code to generate numbers from 1 to 100 using both an array and a linked list. Compare the two approaches and discuss any advantages or disadvantages of each.

Ans. Using Array List:

numbers=[] {// Initialize empty list

for i in range(1,101): // Use for loop to append numbers from 1 to 100

    numbers.append(i)

print(numbers)    }// display the output

Using Linked List:

class Node: {// Declaration of Class in Python

    def \_\_init\_\_(self, data): //initializer used to initialize newly created instance of a class

        self.data = data // reference to current instance of a class

        self.next = None //

class LinkedList: // Declaration of Class in Python

    def \_\_init\_\_(self): //initializer used to initialize newly created instance of a class

        self.head = None // reference to current instance of a class

    def append(self, data):// defines a method append within a class

        new\_node = Node(data) //Create new instance of a class called Node

        if self.head is None:// check if the linked list is currently empty

            self.head = new\_node //Set the head of the list to new node.

            return //exits a function

        last = self.head// refers to the first node of the list

        while last.next://loop condition used to traverse a linked list until the end

            last = last.next// Context of linked list to move the last reference to the next node in the list

        last.next = new\_node// used to append new node at the end of the list

    def print\_list(self): //print the element of the list

        current = self.head//start traversal from head of the list

        while current://traversing a linked list

            print(current.data, end=' ') //used within a loop to print data of each node without adding newline

            current = current.next//advance the traversal of linked list

        print() //show output

linked\_list = LinkedList()//  Create a linked list

for number in range(1, 101)://Insert numbers from 1 to 100 into the linked list

    linked\_list.append(number)

linked\_list.print\_list() }// Print the linked list