**// LINEAR DATA STRUCTURE ASSIGNEMENT //**

**1. Write a program in JAVA to create and display Singly Linked List.**

**Test Data :**

**Input the number of nodes : 3**

**Input data for node 1 : 5**

**Input data for node 2 : 6**

**Input data for node 3 : 7**

**Expected Output :**

**Data entered in the list :**

**Data = 5**

**Data = 6**

**Data = 7**

import java.util.Scanner;  
  
class Node10 {  
 int data;  
 Node10 next;  
  
 Node10(int data) {  
 this.data = data;  
 this.next = null;  
 }  
}  
  
class SinglyLinkedList {  
 Node10 head;  
  
 void insert(int data) {  
 Node10 newNode = new Node10(data);  
 if (head == null) {  
 head = newNode;  
 return;  
 }  
 Node10 temp = head;  
 while (temp.next != null) {  
 temp = temp.next;  
 }  
 temp.next = newNode;  
 }  
  
 void display() {  
 Node10 temp = head;  
 while (temp != null) {  
 System.*out*.println("Data = " + temp.data);  
 temp = temp.next;  
 }  
 }  
}  
  
public class Main10 {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
 SinglyLinkedList list = new SinglyLinkedList();  
 System.*out*.print("Input the number of nodes : ");  
 int n = sc.nextInt();  
 for (int i = 1; i <= n; i++) {  
 System.*out*.print("Input data for node " + i + " : ");  
 int data = sc.nextInt();  
 list.insert(data);  
 }  
 System.*out*.println("Data entered in the list :");  
 list.display();  
 sc.close();  
 }  
}

**// OUTPUT ->**

**Input the number of nodes : 3**

**Input data for node 1 : 5**

**Input data for node 2 : 6**

**Input data for node 3 : 7**

**Data entered in the list :**

**Data = 5**

**Data = 6**

**Data = 7**

**2. Write a program in JAVA to create a singly linked list of n nodes and**

**display it in reverse order.**

**Test Data :**

**Input the number of nodes : 3**

**Input data for node 1 : 5**

**Input data for node 2 : 6**

**Input data for node 3 : 7**

**Expected Output :**

**Data entered in the list are :**

**Data = 5**

**Data = 6**

**Data = 7**

**The list in reverse are :**

**Data = 7**

**Data = 6**

**Data = 5**

import java.util.Scanner;  
  
class Node11 {  
 int data;  
 Node11 next;  
  
 Node11(int data) {  
 this.data = data;  
 this.next = null;  
 }  
}  
  
class SinglyLinkedList\_1 {  
 Node11 head;  
  
 void insert(int data) {  
 Node11 newNode = new Node11(data);  
 if (head == null) {  
 head = newNode;  
 return;  
 }  
 Node11 temp = head;  
 while (temp.next != null) {  
 temp = temp.next;  
 }  
 temp.next = newNode;  
 }  
  
 void display() {  
 Node11 temp = head;  
 while (temp != null) {  
 System.*out*.println("Data = " + temp.data);  
 temp = temp.next;  
 }  
 }  
  
 void displayReverse(Node11 node) {  
 if (node == null) return;  
 displayReverse(node.next);  
 System.*out*.println("Data = " + node.data);  
 }  
  
 void displayInReverse() {  
 displayReverse(head);  
 }  
}  
  
public class Main11 {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
 SinglyLinkedList\_1 list = new SinglyLinkedList\_1();  
 System.*out*.print("Input the number of nodes : ");  
 int n = sc.nextInt();  
 for (int i = 1; i <= n; i++) {  
 System.*out*.print("Input data for node " + i + " : ");  
 int data = sc.nextInt();  
 list.insert(data);  
 }  
 System.*out*.println("Data entered in the list :");  
 list.display();  
 System.*out*.println("The list in reverse are :");  
 list.displayInReverse();  
 sc.close();  
 }  
}

**OUTPUT ->**

**Input the number of nodes : 3**

**Input data for node 1 : 5**

**Input data for node 2 : 6**

**Input data for node 3 : 7**

**Data entered in the list :**

**Data = 5**

**Data = 6**

**Data = 7**

**The list in reverse are :**

**Data = 7**

**Data = 6**

**Data = 5**

**3. Write a program in JAVA to create a singly linked list of n nodes and**

**count the number of nodes.**

**Test Data :**

**Input the number of nodes : 3**

**Input data for node 1 : 5**

**Input data for node 2 : 6**

**Input data for node 3 : 7**

**Expected Output :**

**Data entered in the list are :**

**Data = 5**

**Data = 6**

**Data = 7**

**Total number of nodes = 3**

import java.util.Scanner;  
  
class Node\_12 {  
 int data;  
 Node\_12 next;  
  
 Node\_12(int data) {  
 this.data = data;  
 this.next = null;  
 }  
}  
  
class SinglyLinked\_12 {  
 Node\_12 head;  
  
 void insert(int data) {  
 Node\_12 newNode = new Node\_12(data);  
 if (head == null) {  
 head = newNode;  
 return;  
 }  
 Node\_12 temp = head;  
 while (temp.next != null) {  
 temp = temp.next;  
 }  
 temp.next = newNode;  
 }  
  
 void display() {  
 Node\_12 temp = head;  
 while (temp != null) {  
 System.*out*.println("Data = " + temp.data);  
 temp = temp.next;  
 }  
 }  
  
 int countNodes() {  
 int count = 0;  
 Node\_12 temp = head;  
 while (temp != null) {  
 count++;  
 temp = temp.next;  
 }  
 return count;  
 }  
}  
  
public class Main\_12 {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
 SinglyLinked\_12 list = new SinglyLinked\_12();  
 System.*out*.print("Input the number of nodes : ");  
 int n = sc.nextInt();  
 for (int i = 1; i <= n; i++) {  
 System.*out*.print("Input data for node " + i + " : ");  
 int data = sc.nextInt();  
 list.insert(data);  
 }  
 System.*out*.println("Data entered in the list :");  
 list.display();  
 System.*out*.println("Total number of nodes = " + list.countNodes());  
 sc.close();  
 }  
}

**OUTPUT ->**

**C:\Users\yadav\.jdks\openjdk-21.0.2\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.3.5\lib\idea\_rt.jar=54726:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.3.5\bin" -Dfile.encoding=UTF-8 -Dsun.stdout.encoding=UTF-8 -Dsun.stderr.encoding=UTF-8 -classpath "C:\Users\yadav\OneDrive\Desktop\PRACTISE OF JAVA QUESTION\out\production\PRACTISE OF JAVA QUESTION" Main\_12**

**Input the number of nodes : 3**

**Input data for node 1 : 5**

**Input data for node 2 : 6**

**Input data for node 3 : 7**

**Data entered in the list :**

**Data = 5**

**Data = 6**

**Data = 7**

**Total number of nodes = 3**