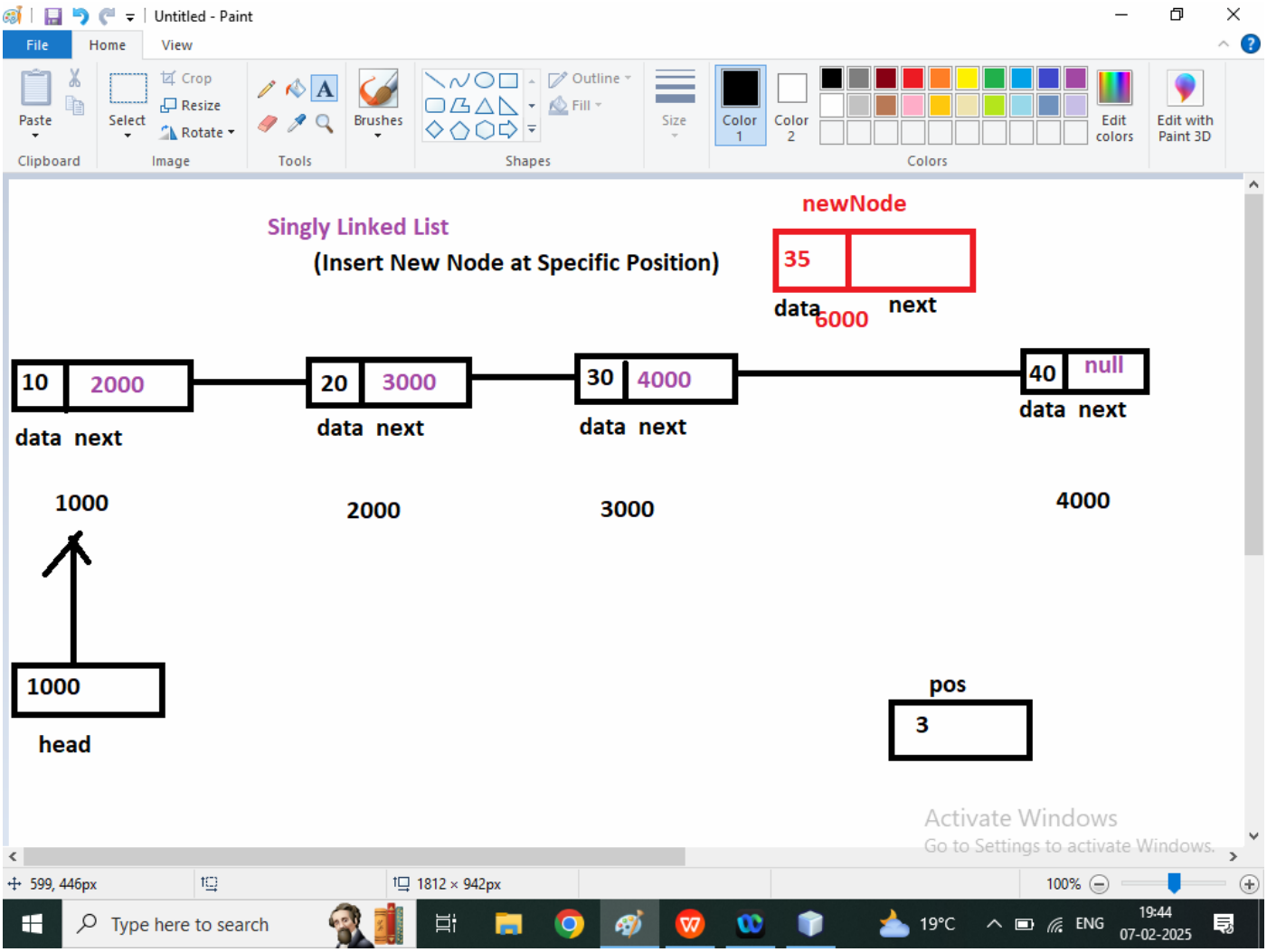
Q1. Write a java program to inser new node at specific position in SIngly Linked List?

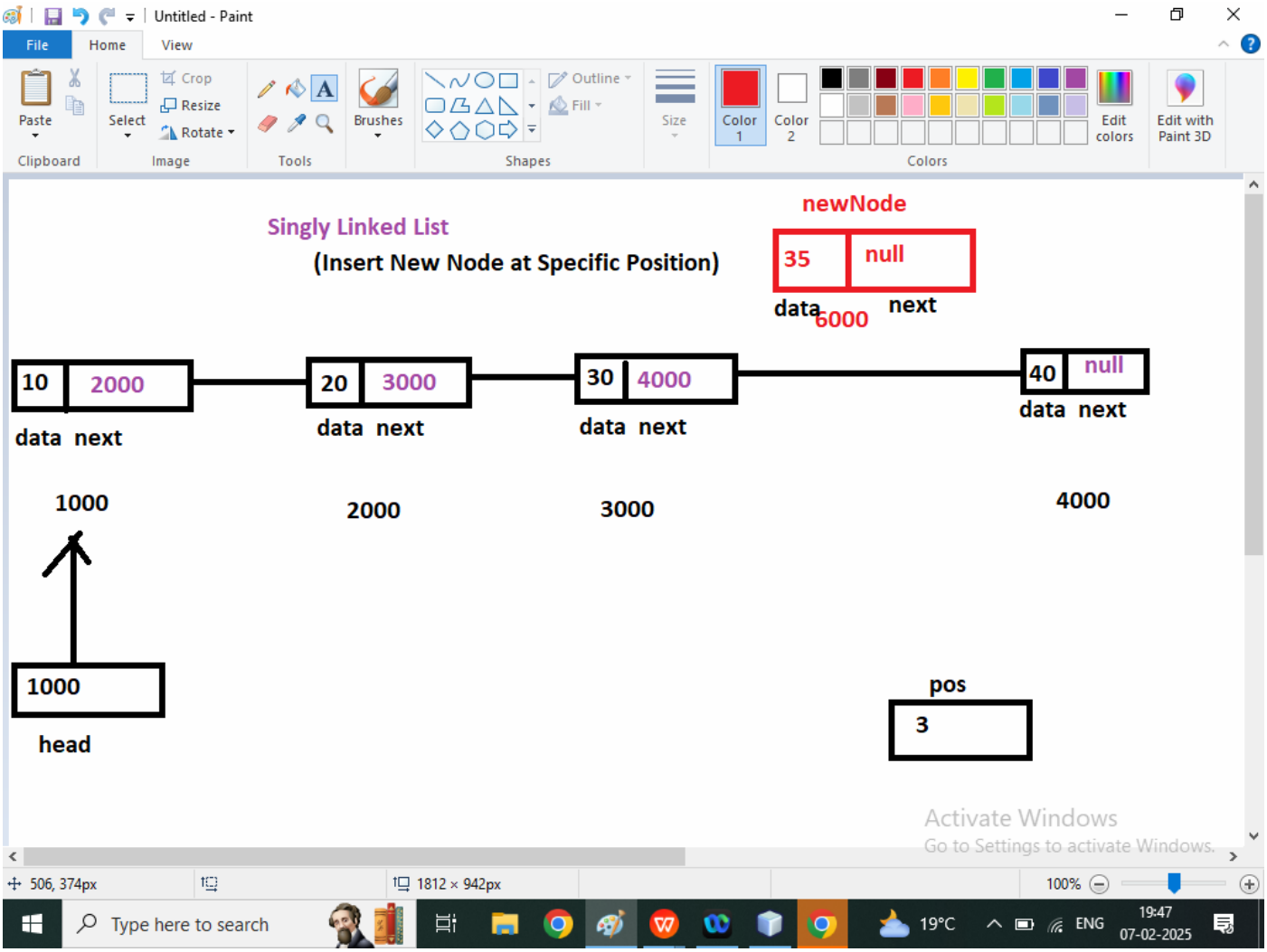


Algorithm to insert new node at specific position in singly Linked

public void addNewNodeAtPos(Node head,int data,int pos)

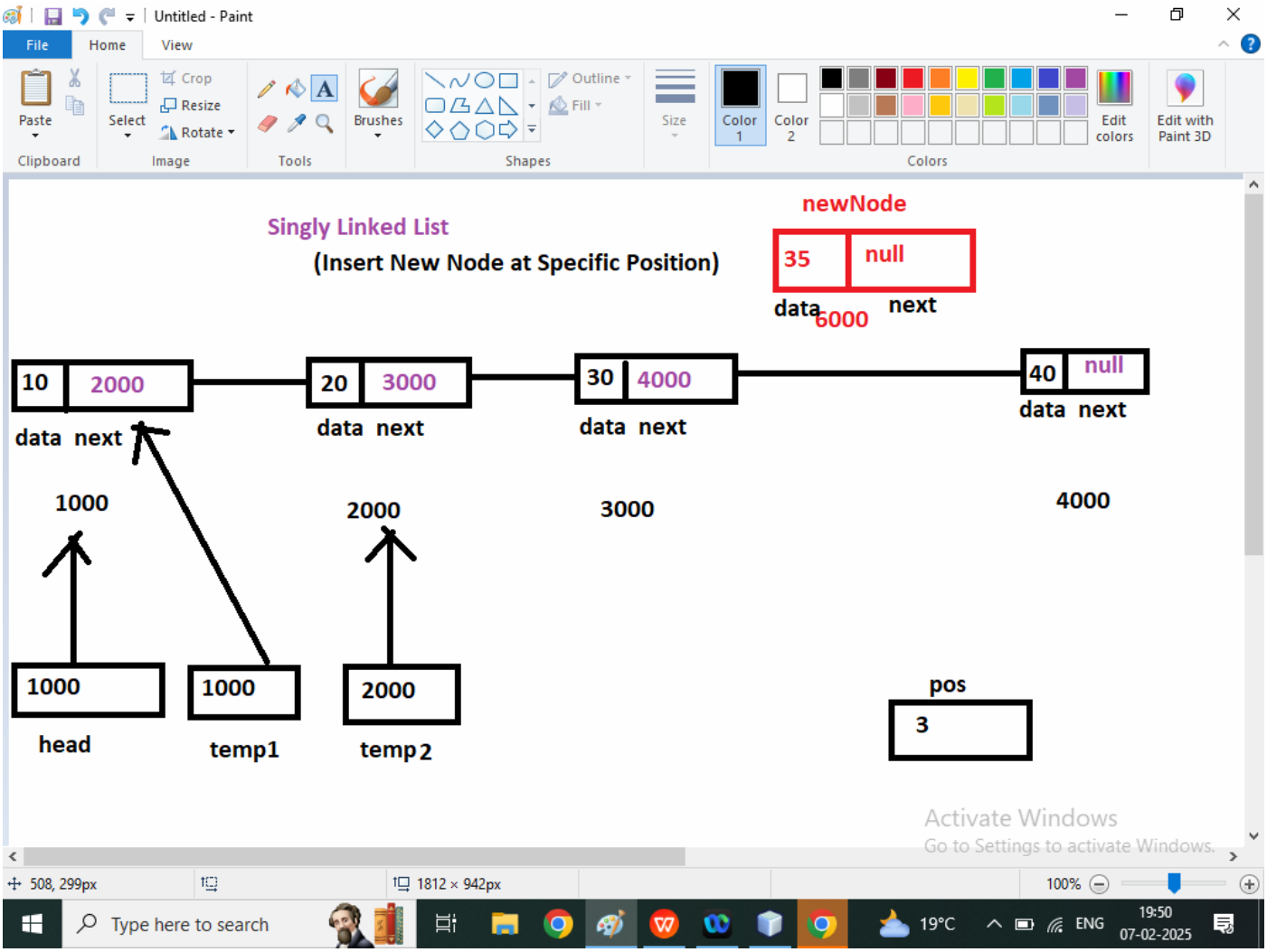
Step1: Create a new Node with the given data

Node newNode=new Node(data);



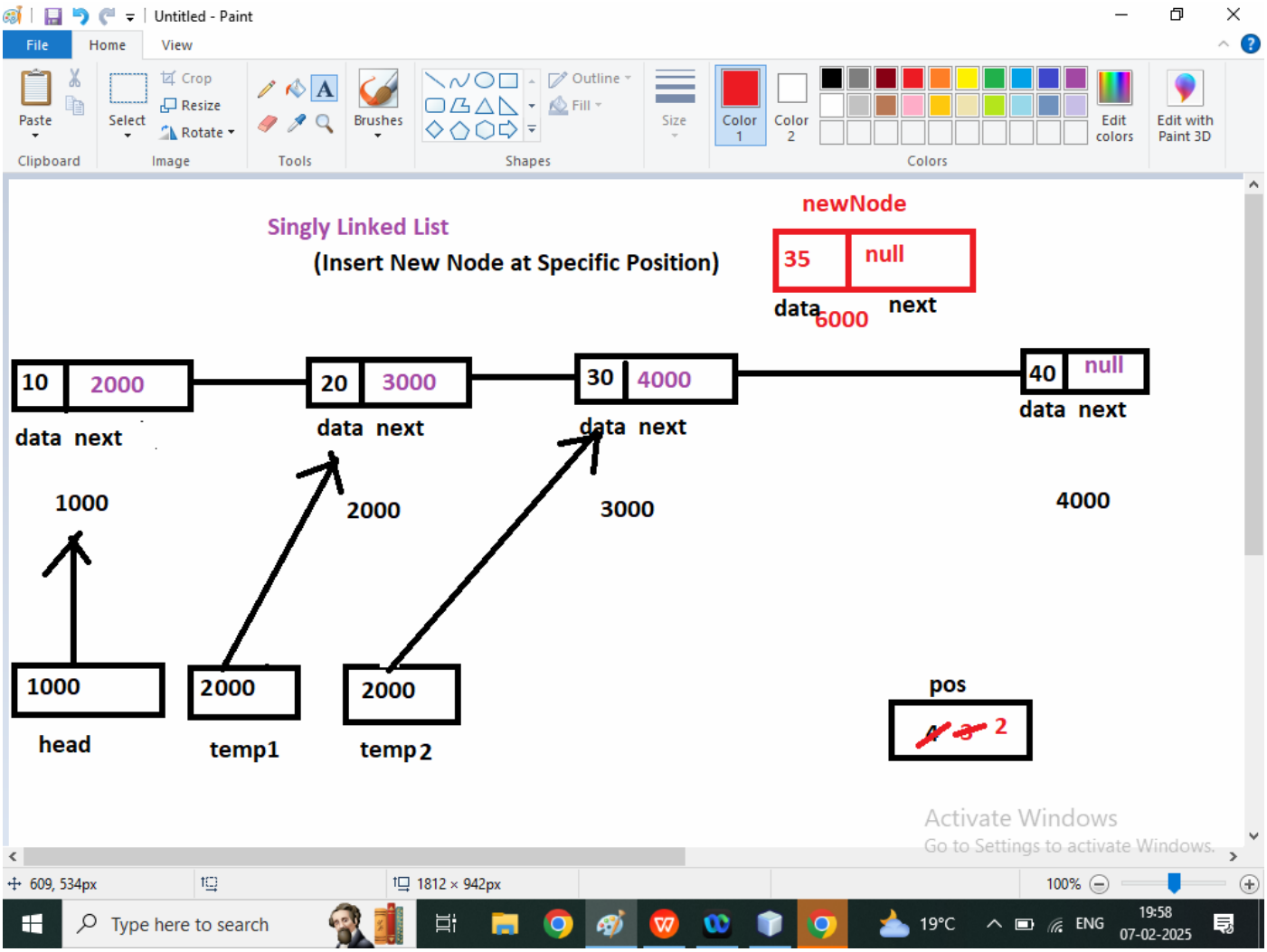
Step2: Traverse the list to find the node just before and after the position of the node

Node temp1=head;
Node temp2=head.next;



Step3: Update Pointer to the newNode

temp1.next=newNode;
newNode.next=temp2;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Edit with Paint 3D
Clipboard
Image
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Shapes
Colors
Singly Linked List
(Insert New Node at Specific Position)
newNode
35
null
data
6000
next
10
2000
data next
20
3000
data next
30
4000
data next
40
null
data next
1000
2000
3000
4000
1000
head
2000
temp1
2000
temp 2
pos
2
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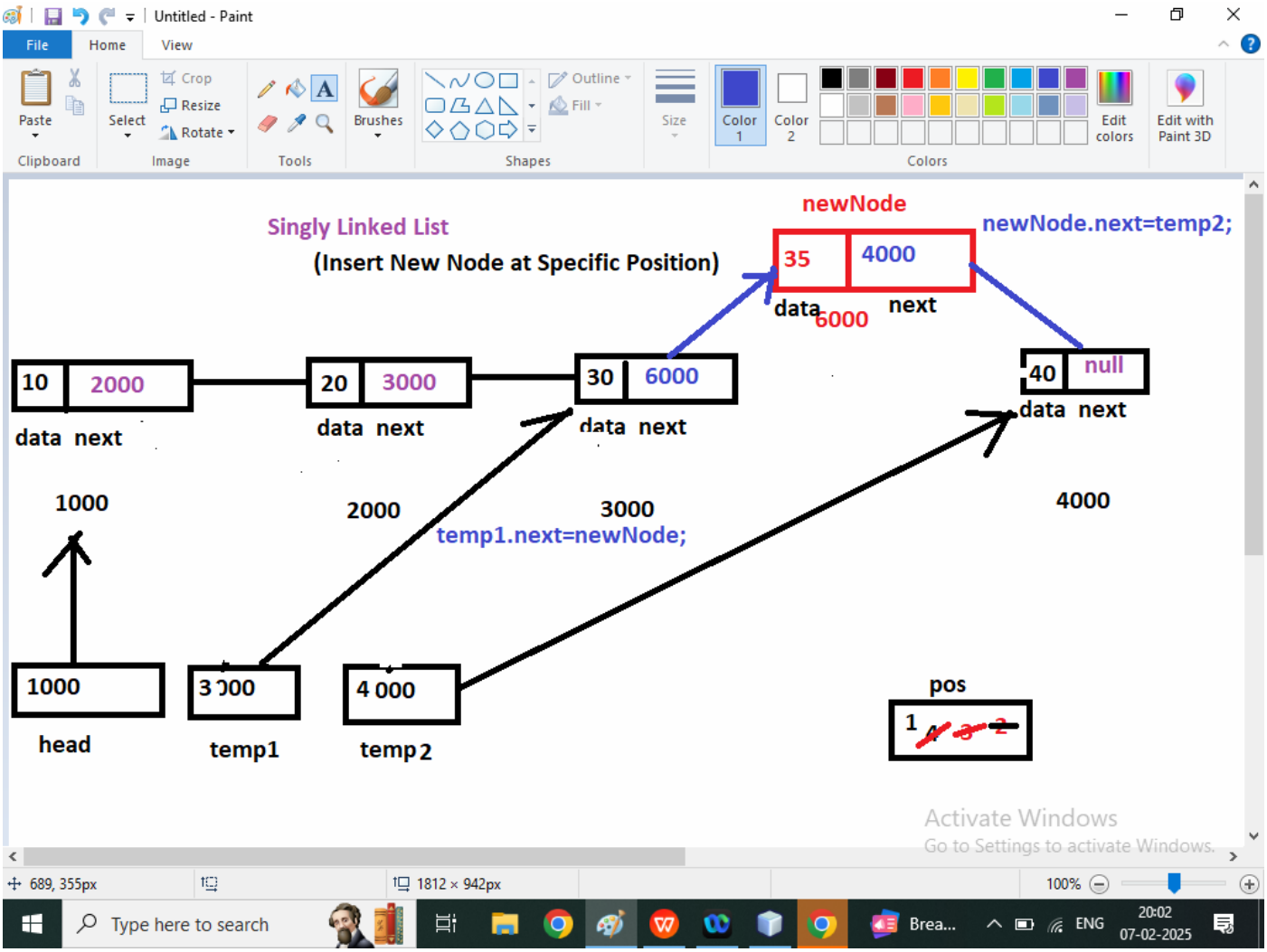
19°C
ENG
19:58
07-02-2025

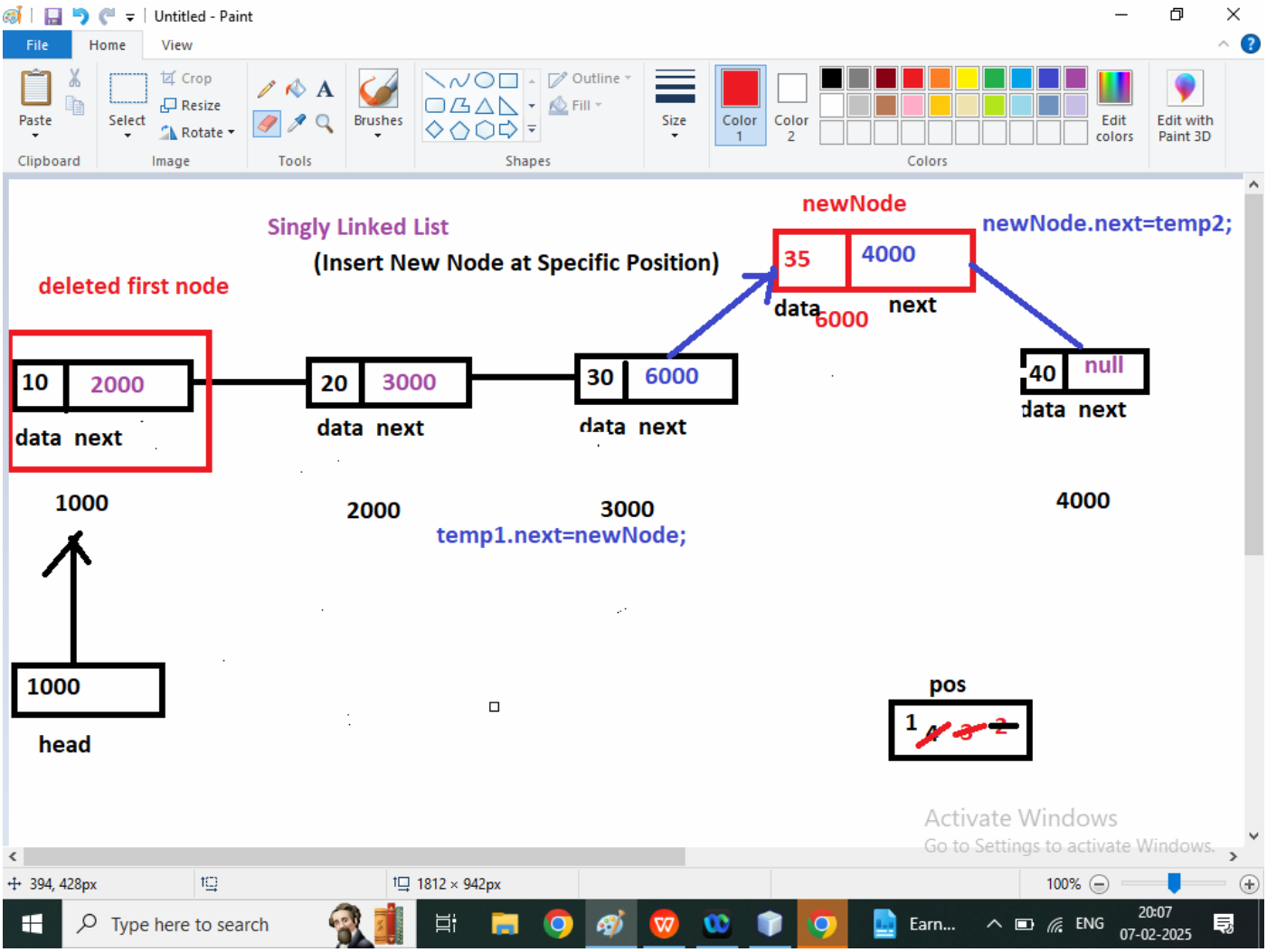



```
/*
 * To change this license header, choose License Headers in Project Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package dsafeb2025;

/**
 *
 * @author Admin
 */
public class Node {

    int data;
    Node next;

    public Node(int data) {
        this.data = data;
        next = null;
        System.out.println("Node created Success");
    }
public void display(Node head){
    Node temp=head;
    while(temp!=null){
        System.out.print("---->"+temp.data);//10--->20--->30--->40
        temp=temp.next;
    }
}
```

```
public Node addNodeAtStart(Node head,int data){
  //step1: Create a new Node
  Node newNode=new Node(data);
  //step2: Make Point NewNode to Current Node
  newNode.next=head;
  //step3: Update head
  head=newNode;
  //step4: return new head

    return head;

}
public void addNewNodeAtEnd(Node head,int data){
    //step1:Create new Node
    Node newNode=new Node(data);
    //step2: Traverse the list
    Node temp=head;
    while(temp.next!=null){
       temp=temp.next;
    }
    //step3: Setting the last node next pointer to the new node
    temp.next=newNode;


}
public void addNewNodeAtPos(Node head,int data,int pos){
    //step1: Create a  new Node
    Node newNode=new Node(data);
    //step2: Traverse the list upto specified position
    pos--;//3
    Node temp1=head;
    Node temp2=head.next;
    while(pos>1){
       temp1=temp1.next;
       temp2=temp2.next;
       pos--;//1
    }
    temp1.next=newNode;
    newNode.next=temp2;

}
    public static void main(String[] args) {
       Node first = new Node(10);
       Node second = new Node(20);
       Node third = new Node(30);

       //Head point the first node of singly Linked List
       Node head=first;
       first.next=second;
       second.next=third;

       System.out.println("Print Data of Singly Linked List");
       System.out.println("===>"+first.data+"===>"+second.data+"===>"+third.data);
       System.out.println("Print Data of Singly Linked List Using head");
       System.out.print("===>"+head.data);
       System.out.print("===>"+head.next.data);
       System.out.print("===>"+head.next.next.data);

       System.out.println("Print Data of Singly Linked List Using Method");
       head.display(head);
      // head=head.addNodeAtStart(head, 5);
       System.out.println("\nPrint Data after New Node at starting in singly linked List");
       head.display(head);
```

```
        System.out.println("print Data After Add new Node at end of singly linked List");
        head.addNewNodeAtEnd(head, 40);
        head.display(head);
        System.out.println("Print Data after insert new Node at Specific position\n");
        head.addNewNodeAtPos(head,35,4);
        head.display(head);

    }
}
```

Q2. Write a java Program to delete first Node of Singly Linked List?



Algorithm to delete first node of Singly Linked List

Step1: Check if the list is empty or not

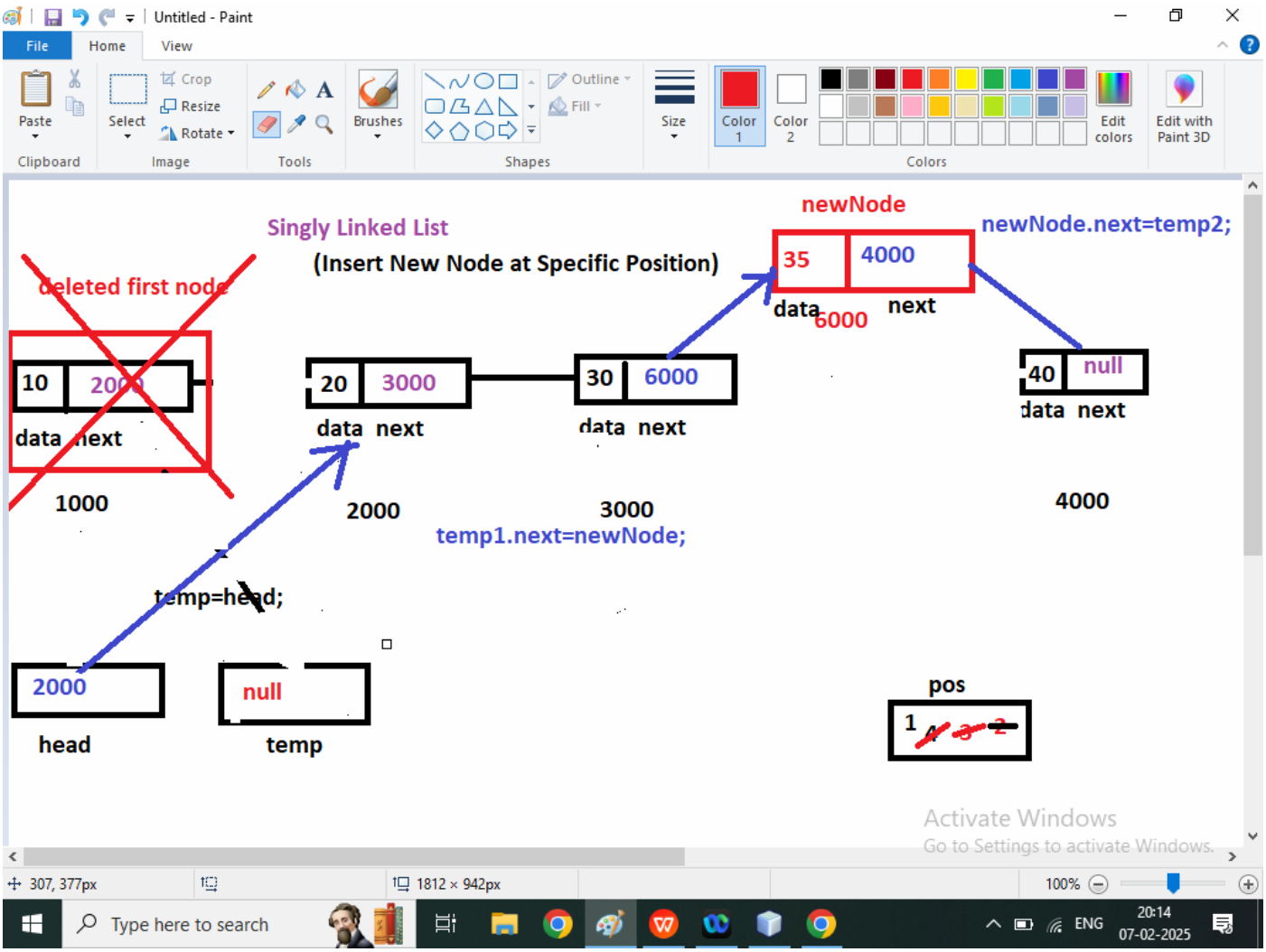
Step2: Store the current head in a temporary variable

Step3: Move the head pointer to the next node

Step4: free the memory of the deleted node

temp=null;

Step5: Return new head




```
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package dsafeb2025;

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 *
 * @author Admin
 */
public class Node {

   int data;
   Node next;

   public Node(int data) {
      this.data = data;
      next = null;
      System.out.println("Node created Success");
   }
public void display(Node head){
   Node temp=head;
```

```
    while(temp!=null){
        System.out.print("---->"+temp.data);//10--->20--->30--->40
        temp=temp.next;
    }
}

public Node addNodeAtStart(Node head,int data){
  //step1: Create a new Node
  Node newNode=new Node(data);
  //step2: Make Point NewNode to Current Node
  newNode.next=head;
  //step3: Update head
  head=newNode;
  //step4: return new head

    return head;

}
public void addNewNodeAtEnd(Node head,int data){
    //step1:Create new Node
    Node newNode=new Node(data);
    //step2: Traverse the list
    Node temp=head;
    while(temp.next!=null){
        temp=temp.next;
    }
    //step3: Setting the last node next pointer to the new node
    temp.next=newNode;


}
public void addNewNodeAtPos(Node head,int data,int pos){
    //step1: Create a  new Node
    Node newNode=new Node(data);
    //step2: Traverse the list upto specified position
    pos--;//3
    Node temp1=head;
    Node temp2=head.next;
    while(pos>1){
        temp1=temp1.next;
        temp2=temp2.next;
        pos--;//1
    }
    temp1.next=newNode;
    newNode.next=temp2;

}
public boolean isEmpty(Node head){
    return head==null;
}

public Node deleteFirstNode(Node head){
    //step1: Check the list is empty
    if(isEmpty(head)){
        System.out.println("List is Empty");
    }else{
        //step2: Store head into temporary variable
        Node temp=head;
        //step3: Move head to the next node
        head=head.next;
        //step4: Free memory of the temporary variable
        temp=null;
```

```
    }
    return head;
}
    public static void main(String[] args) {
        Node first = new Node(10);
        Node second = new Node(20);
        Node third = new Node(30);

        //Head point the first node of singly Linked List
        Node head=first;
        first.next=second;
        second.next=third;

        System.out.println("Print Data of Singly Linked List");
        System.out.println("===>"+first.data+"===>"+second.data+"===>"+third.data);
        System.out.println("Print Data of Singly Linked List Using head");
        System.out.print("===>"+head.data);
        System.out.print("===>"+head.next.data);
        System.out.print("===>"+head.next.next.data);

        System.out.println("Print Data of Singly Linked List Using Method");
        head.display(head);
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        System.out.println("\nPrint Data after New Node at starting in singly linked List");
        head.display(head);
        System.out.println("print Data After Add new Node at end of singly linked List");
        head.addNewNodeAtEnd(head, 40);
        head.display(head);
        System.out.println("\nPrint Data after insert new Node at Specific position\n");
        head.addNewNodeAtPos(head,35,4);
        head.display(head);
        head=head.deleteFirstNode(head);
        System.out.println("\nPrint data of singly Linked List After deletion first Node \n");
        head.display(head);

    }
}
```
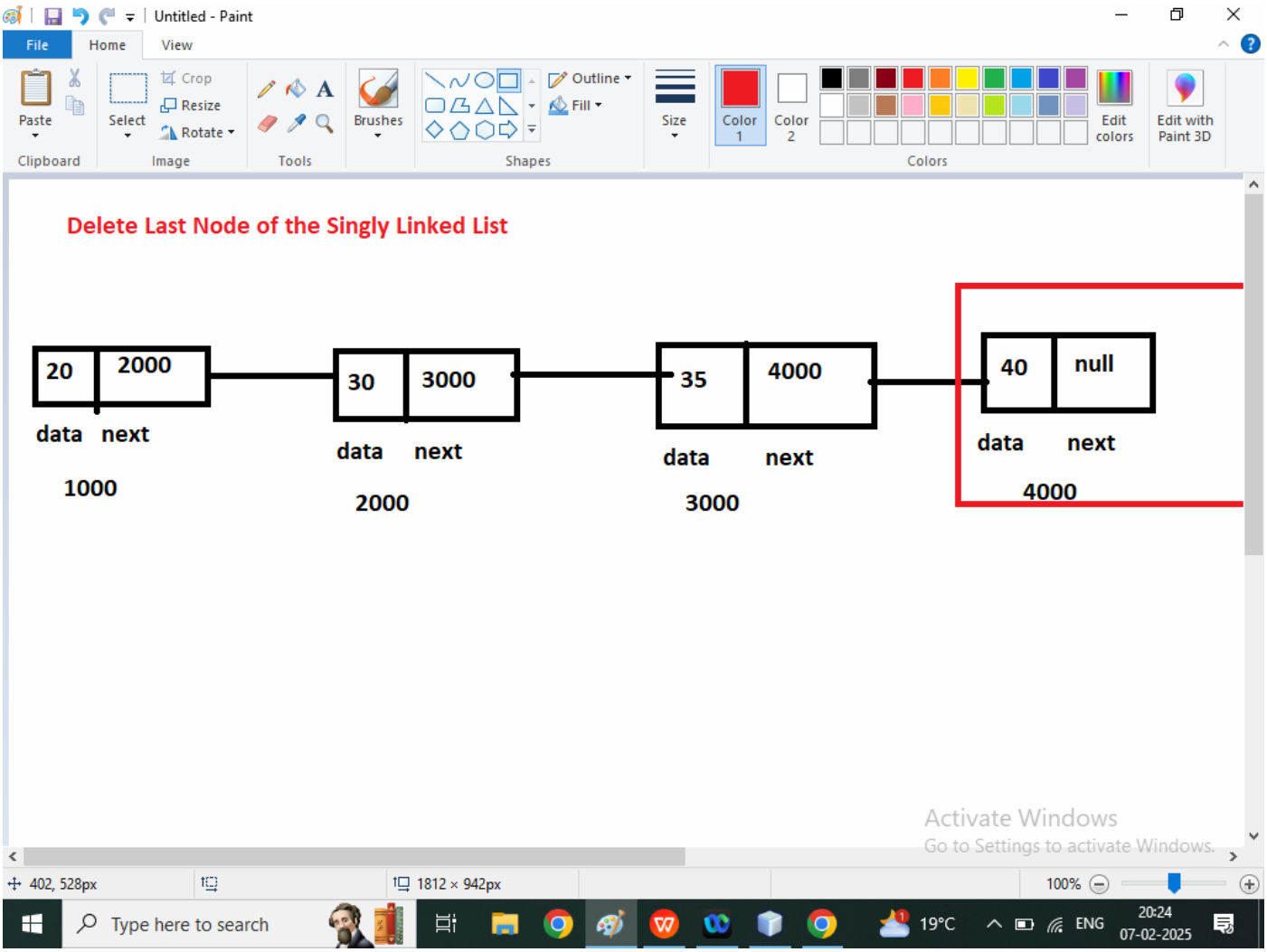

Q3. Write a java Program to delete last Node of Singly Linked List?



Algorithm of Delete last node of Singly Linked List

Step1:**Check if List is Empty or not(if(head==null))**

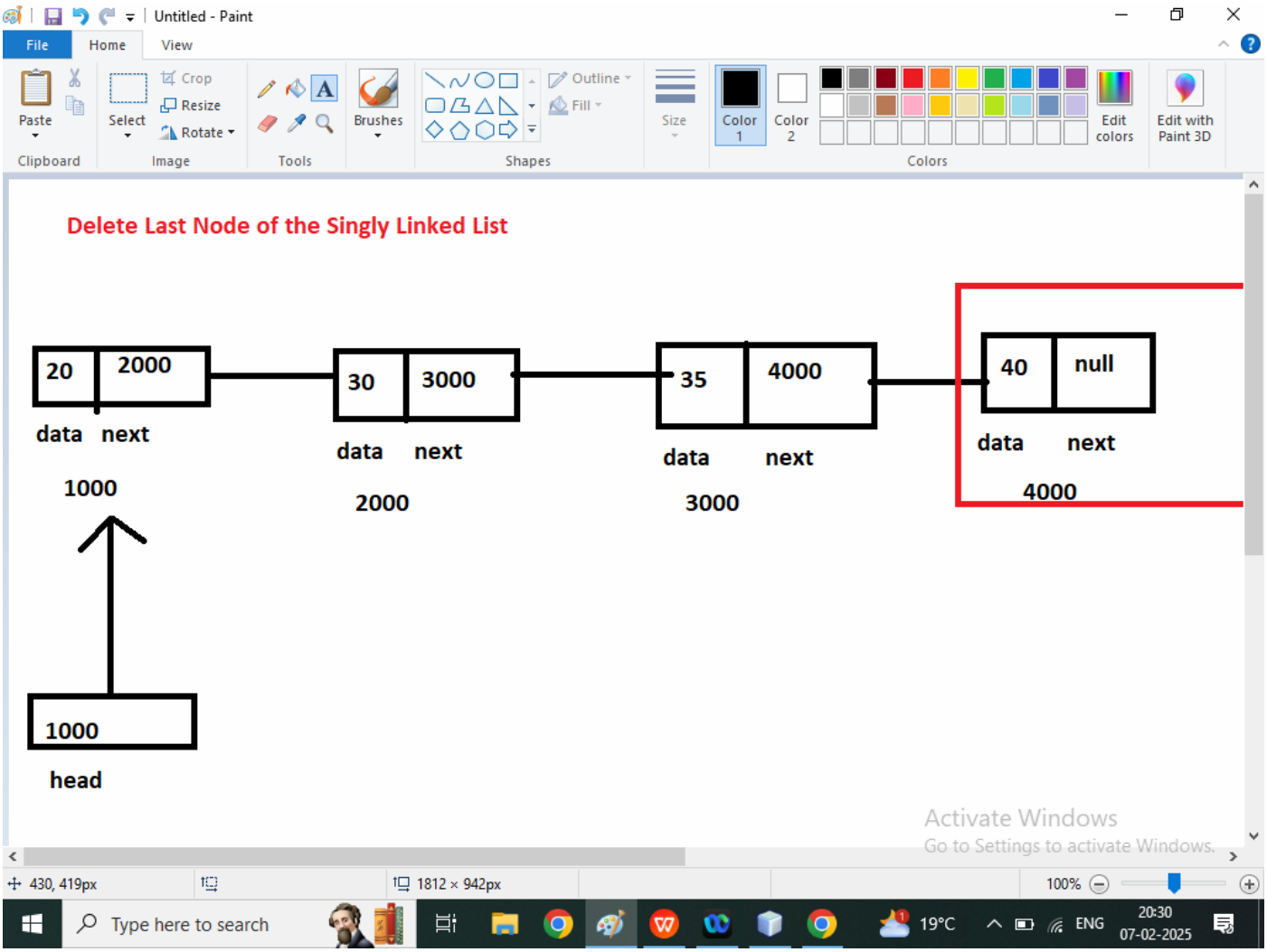
Step2: Check if the list is contain only one node(head.next==null)

Delete head and set it to null

Step3:Traverse the List to find second-last node

Step4: Update the second last node next to null

Step5:Free the memory of temporary variable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Colors
Delete Last Node of the Singly Linked List
20
2000
data
next
1000
30
3000
data
next
2000
35
4000
data
next
3000
40
null
data
next
4000
1000
head
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07-02-2025