

Name of the Student N. Ravi Chandrila

LABORATORY WORK BOOK

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		Aim/			Calculations and Graphs		-	Results and Error Analysis		Viva - Voce	Total
		Preparation	Performance in the Lab								
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7.4	Reverse linked List	4	2	2	1	4	5.5-	4		.4	100
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N- Ravi Chandrika Signature of the Student

• Signature of the Faculty

START WRITING FROM HERE

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tim: a singly linted list linear data structure in which the elements
  are not street in the centiquous memory and each memory is connec-
  -ted only to the rest element using a position.
  (ide:
  clau Nate &
      int data;
      Nate next;
     public Moderant dala) $
         this dala adala;
         this next = null;
7
class linkedlists &
    Node head;
    public void insert At Beginning (Intidada) {
         Node new Node = new Node (data);
         new Node next = head;
        head = newNode;
   public void insentatend (int data) {
       Node new Node = new Node (data);
       it (head == null) $
           head = newNode;
       3 else $
           Note temp = head;
          while (temp-next! = pull) }
               temp = temp. nent;
```

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mente
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temp-nest = newshodes
       public vad insert-AlPosition ( At data, it position) &
           Node new Node & new Node (dal 0); __
           11 / position = = 03 $
             insed At Regioning (data);
          7 else 9
           Node temp + head;
          ta (int 1 = 1; 12 position & & temp! = rull;
             temp = temp. nent;
         if (temp! = null) §
            new Node. nent = temp-nent;
            temp. next = NewNode;
          System-out-println ("Position out of bounds")
      3
   3
public void childrent Beginning() {
   It (head! = null) §
        head = head-nent
public void delibet and () &
    if (head == null) return; a comment
    if (head next == null) & . i your well
```

```
head smill;
     Jew 8
       Now temp = trad;
       while (temp- next- next 1 + num) &
          temp = temp-next;
      tempinent : neut;
public void autiff Position (int Position) {
3
   if (head == now) retain;
   11 (position = =0)$
     allebAl Beyonning();
 } else {
     Node temp = head;
     for (Int i=1; 12 position & & temp-nent ! = null ; i++) {
       temp= temp-new;
     it (temp. news = now). }
       temp. next = temp-next. next;
    3 clase &
       System. out - printer ("Position out : of bounds");
 3
public void traverseco & 12 million man light
     Node temps head; [looks - + 1 + 4 ] ....
```

```
while (temp! = mull) & ....
           Sydem. end. print (temp-data 1" ");
           temps temp-rent; or all the said
       System. exit-print In ();
   public borlean search Cint Keiji
       Node temp = head;
       while (temp! = null) {
           ff (temp. data == key) }
              ordun true;
           temp=temp-next;
       orchern Falle;
   public and Size() &
         int count = 0;
         Node temp = head;
         while (tempi = null) &
             county!
             temp : temp. nent;
        ordun Count;
public class lintedlist &
      public static void moun (String argic)) {
           Linkedlists led = new linkedlists();
```

```
List inscribit Beginning (10);
          lia-inschalend(20);
          List insert Alposition(15,1);
         System-out-point In ("linked List:");
         lia traveucco;
         System-out-println ("Size: "+ List. Size());
        System-put. print in ("Searching for 15: " + list. search (15));
        System. out. printen ("Searching for 25:" + list. Search (25));
        lid-delete Al Position (1);
        System.out. print In ("After Deletion:");
       List .traversecs;
output:
 Linked List:
 10 15 20
Size: 3
Searching for 15: True
Searching for 25: Falle
Alter deletion:
 10 90.
Aim: Given head, the head of a linked list, determine if the linked
```

Fire: Given head, the head of a Linked List, determine if the linked List has a cycle in it. There is a cycle in a Linked List if there is some node in the List that can be oreached again by continuosly following the next pointer.

Code: Class List Node ?

```
ROLL NUMBER
                     ListNode next;
        List Node (Int n) {
          next : bull;
   ruhuc bodean havcycle (List Mode head) &
 public class intedistrycle &
      If (head == null II head. nent == null) {
      List Node Slow = head;
     listalode fast : head.nent;
    while (slow! = last) &
       if (fast == null | fast next == null) &
          ictum tabe;
      slow = Slow next;
      fax = faxt. next. ment;
  return true;
public static void main (String args (3) {
  listNode noder = new listNode (3);
  list Node node 2 = new Lest Node (2);
  List Nude node 3 - new list Mode (0):
 list Mode mode 4 = new list Mode (-4);
                                        Store & Box
 nodel-next = nodez;
 nodez-rest = node3;
 nodes next = node4; servit + + 1 1 rekent, or trade part ments
 nodelinent = node2;
```

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HOLL NUMBER:
```

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Linkedlistcycle Adultion = new Linkedlistcycle();
         Syllin ad pring of Cycle Odected Corompie 13: * solution bas
                                                      eyele(node));
        List whole rooks a new List blockers;
        tist Airde mode B = new list Noction;
        rochanist = node B;
       System.out print and Cycle Described (Framples): " + solution. has
      System out printin ("Cycle Odeded (Example 3): " & solution. has Gyde
       tisulate modec = new tistillade (1);
                                   process with a common of the state
 3
 Ont Drig:
 Cycle Delected (Example) : True
 Cycle Detected (Example 2): True
Tyde Octoded (Example 3): False.
 Aim: Given the head of & linked list and an integer val, remove
au the nodes of the linkedlist that has Mode. val = = val & return
new head.
(ode:
class l'arlode {
   int val;
   l'sk Node new;
   1954 Node Cint x) §
      val = 2 ;
      neat = null;
public clas Pernove-Pinted-List-Elements &
    public Listalode removeElements Clistalode head, int val) &
    list Alode dummy = new List Node(0);
```

```
dummy nent = head;
           Cisulade current e dummy;
          White (corrent nent 1 = new) {
             fi (according to val) & right round
               current . next = current . next . next;
            } chie $
               current + current next;
       return dummy nent; liment from to plant
    public state void main (string augs []) {
      Remove-Linked-lig- Flements onew Remove-Linked- 1984();
                                       item no in
     tist Node 1 = new List Node(1);
     list Node 2 = new List Node (3);
     List Node node 3 = new List Node (6);
    list Node nodey = new List Node (3);
    list Mode rodes = new list Mode (4);
    list Node node6 = rew list Node (5);
   ListNode node7 = new ListNode (6);
   nodel. next = node2;
   nodez next = node3;
   nodes. next = nodeu;
  node 6. next = node 7;
  printlist (nodel);
  listalode viexult = solution. Temove Elements (node 1, 6):
 printlist (result);
                                   Friend Friend
                               Sparal Vender Descript
public static void pointlist (List Mode head) &
    ListHode current = head;
    While (corrent! = null) of
```

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```
System. and print (consent. val +" ");
            censent - current-nent;
          System. out pintles .
     Aim: Given head of a singly Linked Met, oneverse & onetwo the list.
7.4
    code:
     clas list Node &
        ent val;
        lish Node next;
        lishlode (int x) §
           val = 2;
          next = null;
     public class Reverselistedlist &
        public l'ist Node revuselist (lest Node head) {
           List Mode prev = Mull;
           list Node current. = head;
           while (current != null) }
              Listalode nentTemp = current nent;
              current next = pover;
              porev = Current;
             Current = next Temp;
          outun priev;
```

```
public static void main(stiling age(1) 9
           Revouel intedlist eduction + new Revouelinkedisto;
           Listatode nodel = new Link Node (D;
           listalode nodes . new Listalode (s);
          portet next = nodez;
          node in rest a nodes;
          printlest (roder);
         Listhode result = solution. revocalist (node);
         printlist (result);
     public gatic void printlist (List Node head) ?
        List Node current : head;
       while (current] = null) &
           System.out.print (Current.val +" ");
       System. out . println ();
Aim: Given the head of Birdy linked list, oreturn true if it is
palindrome or take otherwise.
code:
class list Mode, &
  int val; L
   listNode next;
  List Node (int 2) }
       val = x:
                                  Trough the continued
      next = null;
                             11/16
```

```
public clas Patindrometinked List &
   Public boolean ispalindione Clistalode head) &
      List & Integers values = new ArrayList = 20;
      Listalode current + head;
      While (current 1 = rull) &
         values. add Courrent. val);
         current : current neut;
              The Property of Alberta Commence
     "int start = 0;
     int end = values size()-1;
     while (start Lend) §
       it ( | values.get (start). equals (values.get (end))) }
          Detun False;
       Start++:
       end -- ;
    sietur frue:
public static void main (string args []) {
   Palindrome Linked List Solution : new Palindrome Linked List();
   ListNode nodel = new ListNode(1); # Book3 = 2
   list Mode node 2 = new List Mode (2); # node 4 = 1
   nodel. next = node2;
   nodez. neut = node4;
   printlist (nodel);
   System-out-pointin (solution. is Palindrome (nodel);
public Static vord printlist (List Hode head) {
     List Mode current : head;
                                          1 7 5 h 3
    While (current! = null) {
```

```
System. out- printen (current-val) " ";
        current a currentament;
       System out print In O;
  Input: 12345
 Alin: Given the head of a Birgly linked dray, outure, prioddle
 nade of tist, if there are two middle nodes oretrum second middle
                           phone for time in
code:
class listAlode §
   int val;
   List Node next;
   list Node (Port a) §
                               Set of their discourses
        val = 2;
       neat = null;
public class Middle Ofthelinked list {
   public list Mode middle Node (List Mode head) &
       List Node slow = head;
       List Node tout = head;
       while (tast = nul & & tast nent != nul) &
           you = stownext;
           fast = last next next; it , it who is still the 11
       ; wok nurbic
```

```
Middleoffhelinkedlist sandion: rew Middle Othinkedlisto;
     public void main ( string angle ) }
        list Hode nodel = new List Node(1);
        list Mode roder = new list Mode (1);
        nodel next = node >;
        node 4 . next = node 5;
       printest (nodel);
       List Node middle Alode : solution. middle Node (nodel);
       printlist (midale Node);
   public Static void printlist (List Mode head) {
        list Node current : head;
       While (current!=null) {
           System. out. print (current. val + " ");
           current = current. nent;
       System.out. println();
3
Output: 345
Am: Given head, which is of reference node to a singly-
einted tist. The value of each hode, in linked list is either
0 of 1. This holds the binary rereposedentation of an
number.
                                       21416 m 450
```

```
code:
 class Lest Mode &
   int val;
   lia Node next;
   1954 Mode (rol *) {
       val = 2;
      pent = nell;
public class Convert Binary &
    public înt gel Decimal Value (List Mode head) {
       int oresult = 0;
       While Chead! = mull) {
         oresult = result * 2 + head · val;
         head = head nent;
     oreturn oresult;
  public static void main (String angs[]) §
      Convert Brany solution = new Convert Binary ();
      list Node nodel = Dew List Node (1);
      list Node podez = newlist node (0);
      ListAde node3 = new ListNode(1):
     nodel nent = node 2;
      nodez. new = nodez:
     printlist (noder);
     System. Out. printin (solution. get Decimal Value (noder)).
```

```
public static void printlist (LESTAlode head) }
                             List Node Corrent & head;
                              While (current != null) &
                                                              System. but. point (current. val. 4" ");
                                                             current: current nent;
                       System. out point in ();
                                                                                                                                                                                                            a e way ye y "a".
                                                                                                                                                              Continue that in the state
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                                                                   Programme Francisco
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