S.NO	Names of the programs	page no	Signaturu
12	Sorted Array (Bubble Sort)		
2-	Merge Sort	of to	de i
3.	Brany Search		
4-	Lanear Search		
5.	Depth 1984 Search		
6.	Stack Using pointer		
7-	Stack Using Array		
8.	Overe using pointer		
9.	Ovene Using Array		
10.	Inorden Travensel		
11.	Preciden Traversal	្រំ ខាម ពេទ្យ	.41
12.	Post orden Travensal		
13.	Insertion Sort		

APm:

Sort the given array of values To Enter total number of element; 3 c ++ program. using

program Coding;

Include < \$ io Stream. h>

Include < 2 confo. h>

vord marn ()

Sorted data: The Minner

4

Clyscy ();

int a [io], i,j, n, t;

Cout 22" Enter total number of element!;

- Cîn >> n;

Cout 22 "In Enter array element:";

for (9=1; i == n; f++)

cin >> a [j];

for (1=1; iz=n; i++)

for (i=i+1;i==n;i++)

· 08

Tates criming elegants

i carrie goulos

30

38

DP

```
1,5. 2363
output:
 Earley the years noville and stone
Enter total number of element: 3
                                        Carde L
Enter array element:
      90
                    大人, nasavalでいる Labour ng 生
      85
                       5 H office & 25t Just #
      65
                             ( ) atout hist
  Sort ed data:
      65
                             : 13 mg /15
      85
                    M of a figurety
      90
  des 22" Fater letest humber of demontal";
                           en act off
     Sug - " to Fater store Obments ;
                    TOO SE OF
                   ( + of ja - al- part off
                 Carrier Little Bullet
```

```
if (a [i] > a [j])

{

    t = a [i];

    a [i] = a [j];

    a [j] = t;

}

Cout \( \alpha = \text{ln Sorted data}!;

for (i=1;i=n;i++)

Cout \( \alpha = \text{lo} \text{lo}";

    getch \( \text{l}; \text{l} \)

Result:

Thus the given armay of Value & Sorted.
```

A THE RESERVE TO BE STONE OF THE PARTY OF TH

```
2. Merge Sort
```

```
Acm :
```

To array the given humber using Morge Sort.

program Coding:

Proclude 2 Postream. h>

include < conjoh >

vold ms (Pnt, int);

void merge (int, int, int);

int a IroJ, n, i,j;

void marn ()

elxscr ();

Cout 21" Enter Number of Element:";

Cin syn;

Cout 12" In Finter array elements:";

for (izljizn;j++)

cin >7 a [i];

ms (1,n);

```
Cout 22 "In Sorting order:";
  for (i=1; iz = n; i++)
  Cout 22" |n" 22 a [i];
                  Turnber of Chement:
   getch ();
3
void ms (Pot dow, int high) worrd rotal
  ę
                                      20
   94 ( Low / high)
                                     500
     Put mpd = (low + high) 1/2 ]
     ms (low, mid);
      ms (mpd +1, high);
                                      OSL
       merge (low, mpd, high);
                                     312
   3
                                     003
  void merge (int low, ont med, ent high)
     Put h = low, i=mpd +1, k=low, b [io];
      Where (h = med & & i = high)
      Pf (a[1] 1=a[])
```

```
Carter of (1-1)
output:
                    County of the Land
 Enter number of Element:
       5
         omay relement: 111 5m
      20
                        (Heid . Del ) 47
      40
       500
              : 2 [deld + wel] - 120 Map 1/2;
       700
       50
                         (hear and) but
   Sorted
           order:
                      ( dai . ( 1. 1.2m) on
       20
                   They was speak
       30
       40
       500
     שבלא היינים ולהב לבשו לבנ הילו לו בפרם
      the bearing to be found in the
           CHRONE - I BE WALL TO ST STANSO
```

```
b [x++] = a [h++];

else

b [x++] = a [i++];

If (h > low)

for (Pnt j = i; j = high; j++)

b [x++] = a [j];

else ff (i>h)

for (Pnt j = h; j = mid; j++)

b [x++] = a [j];

for (int j = low; j = high; j++)

a [i] = b[j];

3
```

Rosult:

Thus the given number are Sorted using mange Sort.

```
3- Blary Search
```

```
APm:
```

To Search the Given number using binary Search method.

program Cooling:

#Proclude L & Postream. h>

Proclude L& confo.h>

Vold main ()

Pnt a [100], n,i, beg, end, mid, data;

Clyscy ();

Cout 22" Enter number of element-";

(in >> n;

Cout 22 " In Enter array element in Sorted

order :";

for (1=1; ian ; i++)

Cln >7 a [i];

Cout 22" In Enter data want to Search-";
cin >> data;

```
beg = 1;
    end = n;
 mpd = n/2;
                                      Frage and the relation of the training and the second of t
while ((beg zend) & & (a [med]! = obta))
timber among eternant on Lented order:
    if (a [mid] > data)
      4
                      end = mid -1;
                        Files, clote evont te Scarch _ 7
           else
                                                                                                                                                   Bours 98 found
                   4
                        beg = mid +1;
                      3
                           mod = (beg +end)/2;
          3
    if (a [mid] = = data)
             Cout 22" In Data 98 found";
         e18e
                 Cout ZZ" In Data is not found";
              getch ();
```

3

10 - 67 output: Enter number of element 54 Enter array element in Sorted order: Codal of Eligibal Codal it - bla - tors Enter data wont to Search _7 Data 98 found tit him put : Albert gell win (timb - (| - 1) - 1) Pares 12 To Tella Fil deuner? "man tx d and of M er i kask

Result:

Thus the given number & Sanchod using binary Search method.

4. Linear Search

```
APm:
 to Search the given number using Linear
Search method. English to radiust radii
program Coding:-
                ther wrong Element:
 # Proclude < # Po Stream. h>
 #Proclude < Zconso.h>
 # Proclude < & process. h>
                   Titler Reach Cherrent
  void main ()
                                  DE
  Int a [10], se, i, n;
   ehrser ();
    Cout 12" Enter number of element -";
    cin >>n;
    Cout 22" In Enter array element:";
    for (i=1-,i zn:,i++)
    ein >7a [i];
     en sra [i][j];
```

```
Cutput:
         of element -3
Enter
                 - por more
          element:
Enter array
               A. more of star - Laborate
     79
                 The charle sale has
     30
     100
                MINISTER - & LICITSE P.
Enter Search element:
                      Californ Bay
    30
 (C) +22 pla
  Calt 22" Enter Trember of Fourst . "
                        ince mis
    "t bramate gover roter of " as Jose
                College Tetal var
                   the state of
```

A read of the same

```
Cout 22 "In Enter Search element:";
  Con >7 80;
 for (i= 1; iz =n; 1++)
  if (a [i] = = se)
    Cout ZZ" In "Element 98 found.";
    getch ();
   exit (b);
    3
    (out << "In Element & not found.";
   getch ();
   3
Result:
```

Thus the given number is searched asing Unew Fewich method.

```
6. Depth first Search
```

```
APm:
  To Search the given number using depth
first Search method.
program Cooling:
 # Include < 4 Postream. h>
  # Priclude / Confoin>
  class graph
   Post a [10] [10];
    Pnt V[10];
    Pup no
   Public:
    vold getgraph ()
     Cout 12 "Enter number of nodes -";
      efn >> n-,
      for (int i=1; 12=h; i++)
```

```
for (int j=15j < n; j++)
                                                                                                                         district to the
  cen >7 a [i] [j];
      for (i=1; i < n; i ++)
          V [i] = 0;
                                                                                        Figher the Humber of necles - 6
     gts (1);
            and the state of t
          void offs (Pnt x)
               Cout = 225" In visit:" 1 20 x 022 " In"; 1
                 ししょりニリン
                       for (Pat i= 10, i = 1) 11 0 1 0 0
                        if (a[x] [i]==1)
                        Pf (tv [i])
                                                                                                                                                                                                           1 : HIRIV
                                                                                                                                                                                           S High
                                         dfs (i);
                                                                                                                                                                                                     VISIL : 3
                             3
                     3
                                                                                                                                                                                                 1 : 112 iv
  3:
                                                                                                                                                                                                 A. Hafe
                   void magn ()
                             elyser (7)
```

Depth Arst Search output : number of nodes - 6 10000001 10000 1 2 3/14 100010 00 1000 Visit : 1 visit : 2 visit: 3 visit: 6 VISIE: 4 Visit: 5

graph 9;

g. get Graph (?;

getch (?;

3

Rosult:

Thus. the given number is Searched wring depth

first search matried.

```
6. Stack using pointer
Acm:
     implement a Stack as a linked lest
  40
using pointer.
program Coding:
 # Include < & Po Stream. h>
 # Proclude < & Conjoin>
 # include < 28tdlib. h>
  class node
    Ent data;
     node * next;
     Public;
        node ()
       9
        data =0; next =0;
        Friend Class Stock;
```

3.

```
class Stack
 node top;
 public:
  Stack ()
    ( top =0;
    3
    void push (Bot x);
     void pop ();
     void display (?",
3,
vocal Stack :: push (Ent oc)
   node * temp = new node;
   temp -> data = >c;
   17 (top ==0)
   top=temp;
    else {
       temp > next = top;
       top = temp; 3
```

```
void stack :: pop ()
  pf (top ==0)
   Cout 22" In Stack Empty.";
   else
   Cout ZZ "In popped = "ZZ top >data;
    top = top -> next;
  3 hand t
vold Stack :: display ()
  4
  for (node * temp = top; temp = o; temp = temp > next)
   Cout 22 temp -> data 22" In";
   3
void moen ()
    Put 9tern C;
  Cl78c7 (2)
     Stack 8;
    do
```

```
Cout 22" In 1. push 2. pop 3. display 1. exit-";
epn >>c;
Switch (C)
       1. post a pop a allegan of call 1
  case 1:
    Coul 12" In Enter 9tem =" 1 1119 mil
     cPn >> Ptem? Udgella 8 909 0 4809 1
     8. push (Ptem);
                        Toker Ptein 2000
      break;
   Case 2 3- 3000 15 yoldsib & god & new of
       8. pop ( ?;
                            ons butter
        break ;
    case s? - short yolg is s god . s 4209.1
       8. display ();
                                   005
        break ;
      de fault:
         Cat (0),
 3
 getch ()",
 while (1),
```

3

Output:

1. push 2 pop 3 display 4. out -1

in the in all the polyphon of the second of the

Enter Ptem =100 mil mint of 1 1 1 100

1. push 2. pop 3. dispby Km+11) 4x01.3

Enter Ptem = 200

1. push 2. pop 3. display 4. exit -2

Poffed =200

a di yed 1. push 2. pop 3. display 4.exit -3

100

tyeak ;

s display (5%

: Marketo

1 70000

() Hoder

ं (1) असी ह

the Stack is complemented as a linked Result: Thus

wong pointer. dest

```
7. Stack Using Array
```

```
Alm:
```

to create, push, pop a Stack Amay.

program Coding:

```
#Include < & Postream.h>
# include < & confort >
# Include < Estal 86 . h>
 Int top=o, a [10], i, n, data;
 Class Stack
   Public:
  Void Push ()
     9f (bp 7 =5)
```

Cout 12" In Stock 98 full;

3

else

```
Cout 22" In Finter data;
   con >> data;
   a [top] = data;
    top ++;
void pop ()
 if (top 2=0)
     Cout 12" In Stack & empty.";
   else
      - - top ;
      Cout LLa [top];
votal alsoplay (1
   if (top ==0)
    Cout 22" In No data In the stack.";
    else
   1
    for (i=top-1; i>=0; 1 --)
```

```
Cout 22 a [i] 22 "In";
                                     -; dogdwo
                                  inter choice:
· vold marn ()
                       1 pash 2 pap 3 display 1
 9
   cirscr (7)
                                inter item so
    Stack 8;
                                 Fister Chaice: 1
    do
     Cout 22 " In Finter Charles: 1. 909 . 2 NEW!
    cout 22" In 1. push 2. pop 3. display:
    On >> n;
                               Enter choice: 2
       Switch (n)
                   1. pren 2. pop 3. dispby 2
                                 topped too.
          S. push (7°,
                               takes choice: 3
            break ;
          case 2: 8 40/98/05 904 5 1859.1
            8. pop ();
             break;
           Case 3:
             s-display (),
```

```
Output :-
Enter Choice:
                                 ( ) man kled .
1. push 2. pop 3 display 1
                                onser (1)
Finter I tem 50
                                  Stack 27
Enter choice: 1
                                        06
1. posh 2. pop. 3. display later al 1 44 that
Enter Item 100 1 2 HENT I All " S Juns
Enter Choice: 2
                            Switch (11)
1-posh 2. pop 3. dispby 2
                           71 98d 5
popped loo.
                      (1°) daug 8
Enter Choice: 3
                        break;
1. push 2. pop 3-display 3: 2 3800
                      8 pap (7)
 50.
                       break j
                        . 8 Jul.
                 3 displayer;
```

```
break;

(ase 1:

exit (o);

3

while (n! = 4)

gettch ();

3

Result:

Thus the Stack operation using array & got.
```

```
8. Quene using positer
```

Acm: To Emplement the Queme operation using panter. program coding: # Include & Postream . K> # Include / Confo. K > Hinclude Listatio. x7 class node ent data (hode next; Public: node () data 20; next 20 8 1

Friend class onever,

```
closs Queue
6
  node front; rear;
  Public:
    Queue ()
      front = year =0;
    void Prosent (intx);
    void remove ();
      wid display ();
  Void Queue :: 9 noert (int x)
    5
     node temp = new node;
     temp > data = x;
     if (rear ==0)
      front = year = temp;
     else
      rear -> next = temp;
      year = temp;
       3
    3
```

```
vold Queue :: remove ()
 9f (front ==0)
  Cout 22 1-1'n ducue is empty.
           inter Them Too "
 (conties "Deleted 12 front 3 data; moral 1
   front = front > next; mail all
  1. Insert 2 delate 3 display A. ecil 2 8
  void onene: : dispay ()
                          deleted Too
   for (node temp = front itemp! = 0; temp = temp = next)
     Cout 12 temp > obta 22" [p"; . 008
    3
   void main ()
      Put Item 1C;
      chrear ();
   Queue 9;
       do
     Cout 22 "In1. Insert 2. delete 9. display
                                     4 end 11;
```

```
output !
              adelete 3 display A. exit, 1
       Finter 9tem 700
     1 Trisert 2 delete 3. alsoplay 4. exity
      Files Plem 800 District Local - more)
    1. Insert 2. debt 9 dfsplay 1.east 2 1
                     Co payed : 1 ware 6700
       deleted 700
   I Insert 2. delite . 3 display 4. out 3
        800, "al" whole - good we down
                              C) about 638
                           for Memile;
                            C1.801 ().
                           P 2 stew 3
```

```
cfn >> c;
     Switch (c)
     ę
      cose 1:
       Cout ZZ"In Enter frem";
        on >> Item;
          9. Prosent (item);
         break;
      Case 2:
         9. remove ();
         break;
       Case 3:
        9. display ();
          break;
       default:
      ext (o);
      3
      getch ();
     where (1);
Result ?
   Thus the querce operations using pointer is
                                     implemented.
```

```
9. Owne wing Amay
```

```
Acm:
      implement the ounce operations using
covicy.
program coding:
   #frelude 2 Postream . h>
  # Proclude Zoon80. h>
  # Proclude / Stalib.h>
   Class pamene
      9nt Front, rear;
      Port 9[5];
       Public:
       Ousie ()
          front = year = 0;
         void Enqueue (Ent x)
         of (year >4)
```

```
Cout 22" In Queue PS full";
elsè
   9 [rear ++] =x;
  3
void dequeue ()
  6
   86
    cout 22" 1 n aveue is empty";
    Cout 22" In Peletid
 Voca display ()
    for (Pnt P = front : i
    Cout 22"In
 3
Void marn ()
  Port Ptem, chin;
  Clyscy (7;
   Quelle 9;
```

```
do
cont 22 "In 1. Enqueue 2. dequence 8 desplay
  I flower deleted c. papping q. entil!
con >> chi
                 inter them to heart sec
  Switch (ch)
  tempates a deletal a alterial 4 extern ?
  cose 1:
    Cout 22" In Enter 9tem to Prosent in;
     1 Enqueus 2 delited 3. chisplay mathire mo
     9. Enque us (Ptem);
                             petetal 300.
     1. Enqueus 2. deteled 3 desplay 4; Lagod
   (ase 2:
                                     . DI
     9. deque le ();
      break;
    Case 3 5
      9. display ();
      break;
     Cose 4:
       exit (o);
  3
    where (n! = 4);
```

Output: the 22 in 1 thouse 2 digmes a display

1. Enqueue. 2 deleted 8. Duplay 4. east 1

Enter Prem to Preext 300 (11) install

1. Engueur 2 deleted 3 offeplay 4. extt 1

Enter Stem to Present 759. al" 12 to 2)

1. Enqueue 2. deleted 3. offsplay A. out 20

9. Ergos as (fiem); Deleted 300.

1. Enqueue 2. deleted 3 desplay 4 exit!

750.

(C) marpho P

1 March

Case 9:

(doc 2;

idose oto

9 display (2)

preak ;

(Cee 4:

edt (d)

the (a) miles

getch ();

Result?

Thus the queue operations using wordy

is complemented.

```
10. Thorden Travensal
```

```
Alm:
                   the birrary tree using
       traverse
  TO
gnorder Traversal.
program Coding:
   #Proclude & Postream. h>
   # Proclude 2 conio. h>
   Class node
   ٤
     Public :
       node * LE;
       Pot dab ;...
       nodet re:
        node ()
         Lc = rc = 0;
     3;
   Void Prorder (node t)
      4
```

```
if (t 1=0)
                                   Lyother
   Proorder (t > LC) is a of while with
     Cout 26 > data < 2 " It";
     Promoter It arc);
     3 op: blide the chair o wight chald age
void main ()
    Clysor ();
     Cout 21" In Fitter the data for root;";
     Int data;
      node* rocti
      root = new node ,
      CPn >> root > data;
     Cout 11 In Enter data for deft childi";
     node temp = new node;
      (Pn >7 temp >data;
        root → 1c = temp;
        Cout Le" In Enter data for right Chilling
       node * temp 1 = new node;
```

output: Enter the data for a root 1 Town Close de state de la la Enter the data for a left child : 40 the data for a right child :90 Ento C) inout blow 70 90. (1) (201) Coul 20" In Enter the close for root;) inter dates; Took Falsof יונטנ = חבו ומוני לוח זיש דככה שלמונים court of the Enter clota to the death toball some years Aubolt the extent significant imal = nic - bor Course of the total of security China Sec 1 (10) H Wasy

cfn >>temp1 = new hode;

root >>c = temp1;

fronder (root);

getcher:.

3

Result:

Thus the bimasy tree & stravered using

Inorder Traversal

```
11. Preorder Traversal
   To braverse the binary true using preorder
Fraver 8al.
```

in Fator for the A west

Aim:

program Codling:

#Include Liostream.h>

Pholude ConPo.h >

Class node

public:

node* Lc;

Pnt data;

node rc;

LC= YC =07

Vold preorder (node t)

hode ()

```
f (t1 = 0)
   (out zzt > clata zz" It";
   preorder (t->LC);
   preorder (t->rc); Hall of whole rough
          Fater coto for vight chiral :84
 3
Void main O nion brov
  Cl 78c7 ();
  Cout 22 "In Enter the data for root;";
  Port data;
   hode* root,
  root = new mode;
   Cfn>> root -> data;
   Cout 42 "In Enter data for left child;";
    node temp = new node;
    cfn >> temp -> data;
```

cutput: Filter the data for root: 70 Enter data for left Child : 22 Enter data for right Child 184 To 22 84. O alon brow Levi 22 "In Enter the doba for sect:"; - stob In Irde treet fort men door Chospacel - solalas Coul 4.4 "In Enter cloto for left child;

nede temp = new nede;

the solumn = the

Co = 171 H

cout <2 " In Enter data for deft child."; node temp = new node; On >> temp >> data; root > Lc = temp; Cout 22" In Enter data for right child;"; node temp 1 = new node; On >> temp 1 -> data; root > rc = temp 1; Preorder (root); getch (1', Thus the bonary tree is wravered

Result:

Using precides Traversal.

```
12. postorden Travensal
APm =
   To traverse the benary tree using postorder
Traversal.
program Codling:
 # Include / Postream . h>
 # Proclude / confo.h >
 class node
                    The state of the street i
   Public:
   hode * Lc;
   Int data;
   node " rc.,
    node ()
            and the second flat that the fall of the second
     1c=rc=0;
     3
 3;
```

Vold postorder (node 1)

```
8f(t1=0)
  postorder (t >LC),
   postorder (+ >re);
  · Cout wit 7 data 22" It" show with 10/1
       Frotes the clote for sight third is a
void main ()
  Claser ();
   Cout 22" In Enter the data for root ?";
   Pot data;
    node " root;
    root = new node;
    CPn >> root -> data;
    Cout 22" In Enter the data for Left child:";
    node temp = new node;
    ern >> temp = data;
             1c = temp;
     root
    Cout 22 "In Enter the data for right
                                  child i";
```

```
output:
   Enter the data for root : 77
         the data for left child : 100 100
   Enter
         the data for right child:23
   Enter
                              ार्थेश काल्यक 🔾
        23 77.
    100
                                (C) 02 (1)
   two or "In taker the data for rott";
                              file clata:
                           i sons " atal
                       heel = new hodes
                     Chn >> seet -> date;
course in the open of shale to the chart's
               Red ! tenp Than Lone ?
                  the solution of the ;
```

```
node temp 1 = new node;

(In >> temp 1 -> data;

root >> rc = temp 1;

post order (root);

getch (1°)
```

Resulti

Thus the blowy free is trovered using portoner povered