K. Sai Abhirav CSE-F AP191100 1033 9

void & B. of the Author & & Diov 1)-#includexstdio.h> void binary (Int [], int, int, int); /+ declaring two functions starting function is to sost the elements in the array #/ 2 · (10 · 10 × 10 -1) · void sosting (int[], int); / + binary function is to implement binary search in array +/ int main() int num, length, i, x, y, sum, peroduct; /+ Initialising the array and declaring variables +/ int our [100);
pointf ("futo the length of array: "); scanf ("xd", & length); perintf (" Enter elements in array (n: "); fon (i=0; ix length; itt) scanf ("r.d", & ars[i]); sorting (and, length); / we are calling the sotting function to sort the elements in averag +) (("n/") Atrice porintf 1" Enter number to search in away (n"); Scare ("xd", & num); binary we, o, length, rum);

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It by using binary hunchion we are searching
the element given by user +/
void sorting I mt ans [7, int length / Traids the
                              Aunction /
  int temp, i, j, sum, product, x, y; in product
   fooli=0; ix length; i++)
     foon (5=1; j<length; j++)
       if (ansi) > consi) A By using this logic
                       are sorting the clem
      f temp = ass[i]; in descending order.
         ans (i) = ans (j);
       f coscij = temp;
  perintfly sorted away is: \n"); (oal)
   Ros(i=0; ix length; i++)
   f porint f[">d>t", oversi));
   pointf("Enter 1st position:\n");
   Scanf ("xd", bx);
   porintf ("Enty and position :10")
   sunt ("xd", ey);
   if (a > lingth 11 y > length)
      porintf ("Enter Valid poritions");
```

else Sum= and [x] + and [y]; A we are calculating sum and peroduct of particular porint (" sum = 1-d", sum); two positions in array peroduct = ass[a] + asis[y]; perint ("peroduct = xdi", peroduct); using needs on par an end from the see void binary (into aru []. intx, inty, inthum) int mid jer, was to make a more from sesson & if (274) printf (" Number is not found in array")) If (asusmid) = = num), age implementing binary pointf ("Number is found in agray in"); else if (aver[mid] > num) binary (are, 21, mid-1, rum); else if lars cmid7 < num) binory (aver, mid +1, y, num); parties orther so ration it is loss from

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Q) 10 10 10 30 90
void of the second
#include <stdio.hz
soid merge sort (int a [], inti, inti);
void merge (int al), int il, int je, int iz, int je);
+ By using merge sout we are dividing the array
into two halves we are sorting the two arrays
individually */
It after completion of sosting of two arrays
we are muging the two arrays to get the
sorted array +/
int main () zin proving.
  int arr (100), n, i, K, paroduct;
  pointf ("Enty number of elements in averay: \n");
   scant [4 1/d", &n);
   posint ("Enter elements in assay; 4)
   Positi=0', ikn'si+t)
   scant (47.d", bar [i]);
                         manb (time pro) si
   merge-sort (are, 0, 7-1);
   porintf ("In Sorted array is;")
   foa (i=0; i<n; i++)
     porintf (" /.d>=", are si);
   genintfluEnty the value of K less than
      y.d. , 2) )
```

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scanf (4xd") & 10);
 peroduct = ars [K] + ars [n-K];
porintfl'in Poroduct of two elements is y.d"
                  (parduct)
& to morned
void mage sost (int asse), inti, inti)
          in a. The principles tohond the inst
& int mid;
   if (paj) is a lease to the of (just) fi
mid= (ifj)/2; st. bird); megge_sort(asa,i, mid);
      meage sout ( asy, mid+1,1);
      merge (are, i), mid, mid +1, j)
void mage (int are [], intil, intil, intil, intil, intil)
a int templical "inj, K'
   i=il,j=j ·i=il) j=i20, K=0;
   while (1<= 11 22 j <= j2)
if (arisi) < artsij)
      2 temp[Kt+]= an litt] jug may is gate

1 finding bollows with and drawned and
  temp (K+t) = 0018[1+t];
                smaller than the ristent
 while (ix=ji) }
          femp(K++) = a918 (i++); }
   while (j <= j'2) {
    temp[k+t]= ax(i+t]; }
69(i=i1)j=0; & ix=j2; i+t);
            009(i) = temp(j); 3
```

3) Insertion south and selection sout? Insertion sout is a souting algorithm where the Insertion sout is a souting algorithm at a askay is sosted by taking one element at a time. The posinciple behind the insertion sort is to take one element, iterate through the sorted areay and find its correct position in the sorted corray. Insertion array works in a similar way as we arrange the deck of courds, si this is the in the state of Algorithmi step 1: If the element is the first one, it is already sorted. Step 2: Move to the next element. Step 3; compared the gurrent element with the elements in the souled array. Step 4: If the element is the sorted agay is smaller than the aurent element, iterate to the next element otherwise, shift all the greater element in the array by on

position towards the right.

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Step 5: Insert the value at the correct position step 6: Repeat until the complete list is sorted. As the average and worst case complexity of this algorithm are o(n2) where n is the norg elements, insertion sout is not good for large data sets promi 2 1 1811 on 12881. Free,

Selection Souti

selection sout is the most conceptually simples of all the souting algorithms. It works by selecting the smallest element of the array and placing it at the head of avaay. Then the process is repeated for the remainder of array; the next largest element is selected and put into the next slot, and so on down the line- Because a selection sout looks at parogressively smaller parts of array each time, a selection sort is slightly faster than bubble sout and can be better than a modified bubble sort.

dosc of the words to the form From sorting the array 52314 first, 2 is inserted before 5, resulting in a5 314 Then, 3 is inster inserted between 2 and 5; Resulting in 23514, me is inserted at start, 12354 finally, n is inserted between 31 and 5, 18345 Time complexity: O(n2) as there are two nested loops -1 polaring to get the hade of assay man Calcology in absoled tost the normain for in the west the rest enter. check and put who the next with and on double the trace to be able to be there is the there is the of a point. There is also in the of Home. I safedier but a signify aster world in the letter track pridot to soat

```
H) #include <stdfo.h>
int main() {
 int agistro), n, i, j, temp, sum=0, poroduct=1, k;
  pointf (" Enter no of elements in everals " n");
  Scanf (4xd", 2n)s
  for(1=0) icn; i++)
  5
     sconf ("Y.d", ass (i));
               Prise police of the second
   for (1=01, Kn-11) i++)
   [ for (j=0; j\n-i-1; j++)
     { temp = ass(j);
           arg(j) = arg(j+j)jn
          ous(iti) = temp; ( ) ( )
   3. 3 Je month bid of stepped throught in stage
   perintfl" sorted arrany in ascending order is in");
   foo(i=0;i<n;i+t)
                  (n== xx1inn).
      posintf("xd10", are [i));
   possible ("sorted array in aternate order is \n");
   foolizo; icn; ?= 1+2)
       porint ("y.d\n", anti);
     3
```

Paintfly sum of all elements in foa(i=0;i<0;i=i+2)sum = sum + and ridy paint (uy.d\n', sum); ٤ prantfl" Product of all clements in even (++[i: [-nsi, 0=i)] position ((n")) fontizot; (<n; = 1+2) 1-1-12 ( 10=1) peroduct = peroduct \* arr li) 2 temp - rash ored ("nibxh) through porrett Menter a number " ")> (1780) Sconf (4xd" &K); ignit = (1) 2000 pointf l'Elements divisible by xd age: 10, x) for (i = o' ixn) it to) 1F (097[i] x k = 20) porint (">d\n'l' arsi)); (b) ) ] setumo; comment of the

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5) #indude (stdio: h > 1) to
roid binary (int (), int, int, int);
                               bin de
void souting (int[], int),
int main() {
    int nume length, i'ju vi roduite is alling
    int ass (100);
    porint ("Enter length of array",");
    & canf (" >.d", & length)
   pointf ("Finter elements for agaay (n");
    foor (i=0; ix length; i++)
      Scanf 14xd", 2 ans [i]);
    sorting (our length); him in the
    ·porintf ("Foly number to search: ");
     8 count (4 /d", brum) Jun I bourned of sels
     binary (ars, o, length, num),
                (come Bitty in the Broad
void souting (int aux (), int length)
& int temp, i, j;
    for (i= 0, i< length, i++)
    a fooij=1) j< length.j++)
           if (agr [i] > agg [j])
             temp= our ci7;
             cans; (flee
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Void binary lint ager [7, snt x, snty, int num) ((411) 1 ) 41 2 porthesos ) if(x>y) E parint 14 Number is not found "Disent mid = (2+4) 25' 1000 to April 10113" Along if (ass (mid) = = num) (At vol s. " 1 . " 1 Arous point ["Number is found"); else if (ass(mid] > num) binary (was, a, mid-1, num) jeres pritical parate ("Fr to num! or to sere, chi else if lase conid] < num) min (16 11) and plucial ( view or pringly unin) binary (arr, midtl, y, num); ( film) in a little full profiles? de mindiposition : in the item. 19 17 10 E 9 1191