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DSA-ASSIGNMENT M. Haritha
                                    AP19110010270
1) Take the elements from the user and sort them
 in descending order and do the following.
 a) using Binary search find the element the
  location in the arrary where the element is asked
  from wer! - afilidans , bsi: , [001] in fai
  b.) Ask the wer to enter any two locations print
  the sum and product of values at those locations
  in the sorted arrayion por notarial 1) 91 min
  # include estalib. har in 19512 11 10-17 10
  It include < stdig. (1)
  int comparator(const void * B, const void * B_1) &
       return (2 (int*) & + * (int*) B)
                 The botton sair of " ) this
  3
      binary search (intarred, int size, int cearch)
      int beg=0, end = size-1, mid;
  2
       while (beg = end) {
           mid = (beg-tend)/2;
           if (arr[mid] = = search) {
             return mid; (1- 19) Ann
          obse if Carr[mid] Lsearch) {
                 end = mid-1,
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else beg=mid+1;
115 1 to 3 1 11 1000 sile aline Million 31 500
  return to
 3. One inemple and suring a similar formation formation for
ent main () & on side porta part di dope
      int arr [100], size, Search, i, pos =-1, loc1, loc2;
Printf("In Enter the size of the array (maxico)")
      Scanf ("% ofod", & size);
      Printf(" In Enter the elements In");"
      for (i=0; i 4 size; i++)3 1. Mill 12 19 19 19 19
           Scanf (" Yod", & arr [i]);
 El Je Line Lagran Jeding dian Jedinegram
     geort (am size, size of (int), comparator);
     printf(" In the sorted array is: 'n");
     for (120; 12 size 1 1++) + (1) dimpliment
     printec"(d", arcli);
       printf("In Enter search element"),
                            13 post of la
       scant (" % d", . &x search);
       Pos = binary search (arrive rearch);
       if (POS == -1) 2 : 1 in an (1)
            Printf ("Not found 10");
          ECADO TEMPORAL SIL
                in I had store
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else 2 printf ("In the 1/d search element ir found
             at index 11.d m, search, Aos);
      Printf ("Enter two indexes in");
      Scant ("6d.1.9 1 8 roc1 Moc 7);
      printfl" sum is "bd/n", ar [loci] +arr[loci];
       Printf (" product is % d /n", arr[loci] *arr[locs];
 3
2. Sort the array using Merge sort, where
  elements are taken from the user; and find
   the product of kth elements from first and last
   where K is taken from the ceur.
   # include cerdio. h>
   Haefine me 100
   int a [mi];
                 (c!(1 100)
   void merge ( int 1, tint vi, int 22 int v2)
     int ijjik; temp [me]; ij(d) idi) bin to
     K=0;
     i= Li;
     j= 2;
     while ((i == 01) && (j == 0)) 2 1
          if (acij cacij)2
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else

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temp [k] = a[i], i++; K++;
   (6 2 1 - 7 1 1 4 History mr. 2 01 1 31 mm 1 1)
while (i'c = 01) &
       temp [k] = a[i]; i++; k++;
     while (je=Uz) &
       temp [K] = a[j]j++jK++;
     for (i=1,1 Kio) i 1202; i++, K++) &
        api] = temp[k];
   void mergerost (int lb, int Ub) 2
     if (lbcub)
        int mid = (Ub+lb)(2;
         mergeort (16, imid);
        mergesort (mid+1, ub);
         merge (lb, mid, mid+1, ub);
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int maine)
2 int in product = 1, K;
   printf ("In Enter the fize of the dray max (100)");
   scart (" eled" | &r);
   for (120;1 4n; 1++) 3
       printf ("a [: (d] (t=")); in illinia
       Scant ("old". &a[i]);
 3. 1.
 meage sort (o, n-1); Pilles (ob, 1)
 Printf ("Enter KIn"); [, 75. 65, 71, 1];
 Scort ("10011, & E) 175100 (71111)
 for (i=0; ick; i++) 2 .1.11
    product * = a[i];
                                  1505G 15059
 3
 Printf l' In the product till the Kth element is Yod'n',
  beturn o;
3) Discuss Insertion sort and selection, sort with
 enamples:
 Insertion Cort
 It is a simple and efficient sorting algorithm,
 that creates the final sorted array one element
 at a time. suppose an array A with n elements
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then the insertion sort algorithm scans Ar from A[1] to A(N), invertion each element : A(K) into its proper position (i-e in Ascending or descending order) I'm the previous sorted sub array A[i].A[i].-- A[k Example'-(1-11;11-1:0-1) 10-Given away: 20, 25, 15, 11, 19, 17, 11) Pass 1: 20, 25, 15, 11, 9, 11, 11 20,75,70,9 Pars 2 15, 20, 25, 11,9 surp 10,15 Pass 3: 21,15, 20, 25,9 1 (15 tape 29,15,11) Pars 4: 9, 11, 15,20,25 (Swap 9") 100 sorted. I (III) Of ile of turking Pseudocode Proce A: array of items All lower on the my my the set in a to dure int key for i ≤ -2 to length [A] (UU/I) do key & A[i] Incert Alil into the sorted sequence [1-1---1]A j≤-e-1 while j>0 and A[j] > key Transfer all in Jesin 1 A [j+1] & Key Scanned with CamScanner

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rend for noth military of the
 end procedure
fime complexity:
   best: o(n) average: o(n²) worst o(n²)
   space complexity: 0(4)
It is like selecting the smallest key repeatedly
in the unsorted array to make softed array.
          16, 19, 10, 6, 5- smallest
Example!
 Pass 1: 5 16,19,10,6-smallest
 Pars 2 in 516 16119, (10) - smallest
    Pass 3: 516,10, 16,19 smallest
    Pass 4: 5,6,10,16,19
   Pars 5: 5, 5, 6, 10, 16, 19 + Sorted.
 Pseudo code
 small = arr( length) 110101
  for l= to
     small = arr[i], pas=j
  for j = Ho udo 2 1 mil 1
     if arr Cj7 L small-teens
 had zarr[i], pos=(i)
             ((i) rest bill a los
      3 = 13+11110 ("1 1") 1 mil
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temp=arr(i), arr(i)=emall, arr(pos)=temp)
Time complexity.
     best: o(n) average: o(n2) worst, o(n2)
space complexity: o(1)
  Sort the away using bubble sort where elements
       taken form the wer and display the elements
                    1) (3) D rot per (3) - + 1 2) gon
   (1) in alternate order
   vii) sum of elements in add, positions and Product of
   dements in even positions.
   (iii) Elements which are divisible by m where m
   ic taken from the wet.
                         Prost of 10, 5 1,1
 #include estation >
void display Alt Sum Pro (int are[], interze) >
      int i, sum = 0, product = 1;
      print ("Alternate elements In");
      for (i=0; ic size; i++) {
            1+(i%) 1=0) 200 11000 511000
                  product += arr[i];
                     Envil- United St. (1) (1)
           elre 9

surn + = orr [i]
                 Printf ("% d", arr[i]);
             3.
                                 Scanned with CamScanner
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}.
                                         Daison Fri
       Print+(" In turn of the odd elements = "/od /n", turn);
  printf(" In product of the even elements = %d \n", product);
             4 10 601 Jet 655 681 7610 07 937 1011 1
 void divmcint arr (7, int size) 2 10 1 100
        int i=0, m for or do note yold all of their
         print ("Enter the m/n");
        scant ("% lod" (& m);
printf ("elements divisible by bd in", m);
        for (120, 128, 20; 1++) 3(1-10) 100; 1/3 1/11
                it (arr[i] e/o m == 0)
             print+("olod";am[i]);
 done par & trisandgarier conseque svisance or otion .
                                 Pholips bobonit-
 void bubblesort (int ans. J. int size)
                                    ibin tai
  2
      int ijjitemp;
                           $ ( ( $ = trist ) 101
       for (i=0; i csize+vi, i++)
      for (j=01; j =9; j=1; j++)
             delan, triti propostar por arr [] Ji
     ar [j] = arr [j+1];
ar (j+1] = temp ju
       dis playAltsum Pro(arr, size);
           dirm (om size)!
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int main ()
  $ (000) " (1/10) : com reals bl . 11 10 man of "14 toing
int arrillood usize i) in on the military
       print f ("In Enter the gize of the array (max 100)").
       Scanf ("e/od", & &ze); 100 this 110 this min
       Print + (" In Enter elements in arraying)
       for ( i=0; i 28ize; i+4) 2 och ( 103") Horing
        ios ( 1=0, "eled", &arr [i]); bel "letans); (m significant peled", &arr [i]); bel "letans);
        3
        bubble sort (arr, size-1); (1+1 ; 15112110-1) vo).
                       (6 = m de [i) (ii) );
        returno'i [i]in in "1. of ") I tair, as I.
   3.
5. Write a remaire program to implement binary search
   #include 4tdio. hs
    int binary search (int arr [] int start, int end, int search) {
            int mid;
                                        in militar toil
            int(start = end){
                   mid = (start + end) (2) 10=11 10=
                   if (arr [mid] = = search) return mid;
                   if (arr[mid] > search) {[1]
                        return binary cearch (arr, start, mid-1,
                    illilling search);
                     return binary search (arr, mid+1, end, sear
                        (1. Darre) on amount of my
              HATUTO ~ 1;
                                          Scanned with CamScanner
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int main ()
3
    int arr [100], size, cearch, i, pos;
    prints ("In Enter the size of the array (max 100)");
    Scant ("% od", & size);
    Printt("In Enter sorted elements in array(n");
    for (i=0; x size; i++){
           scant ("%.d", Lar [i]);
     ξ.
    Printf ("In Enter search element");
     Scant ("6d", & search);
      pos = binary search (arr, o, size-1, search);
      if (pos==-1) printf ("Not found in");
      else printf ("In the "lod search element is found at
                   index (.d/n", search, pod);
       return 0;
```