Assignment-6

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CSE-H

1. Take the element from the users and Sort them in descending order and do the following

a. Using Binary search find the element and the location in the array where the element is asked from user

b. Ask the user to enter any two locations print the sum and product of values at those locations in the sorted array.

```
#include<stdio.h>
void sort(int a[] ,int n)
{
        int i, j, temp;
        for (i=0 ;i<n; i++)
        {
              for(j=i+1 ;j<n ;j++)
              {
                    if(a[i] <a [j])
                    {
                          temp = a[i];
                          a [i] = a[j];
                          a[j] = temp;
                    }
              }
        }
}
int binary (int a[], int e ,int n)
{
        int i=0; j=n-1, mid;
        while (i<=j)
        {
              mid (i+j)/2 ;
              if(a[mid] = = e)
                   return mid+1;
```

```
     else
     {
          if(e<a[mid])
                    j=mid-1;
       else
                    i=mid+1;
     }

  }
  if (i>j)
  {
       return0;
  }
}
int main()
{
       int n,i,a[20],f,e,m1,m2;
       printf("Entr noof elements of array");
       scanf("%d",&n);
       printf("Enter elemets of array\n");
       for(i=0;i<n;i++)
       Scanf("%d",&a[i]);
       sort(a,n);
       for(i=0;i<n;i++)
             printf("%d",a[i]);
       printf("Enter the element tofindinarray");
       scan f("%d",&e);
       f=binary(a,e,n);
       if(f!=0)
       {    printf("element isfound at %dposition",f);
       }
       else
       {    Printf("Element not found\n")
       }
       printf("Enter the position of array tofind sum & product
       Scanf("%d%d",&m1,&m2);
       m1--;
       m2--;
       printf("thesum is %d",a[m1]+a[m2]);
       printf("The product is %d",a[m1]*a[m2]);
```

Q) Sort the array using Merge sort where elements aretaken from the user and find the product of kth element from first and last where k is taken from the user.

```
#include<stdio.h>
#include<conio.h>
int a[20];n,i;
void sort (int , int), Low, high, mid , b[20];
void merge (int; int, int);
void main()
{
   clrscr();
   printf(" Enter size");
   scanf("%d",&n);
   printf("Enter elements");
   for (i=0; i<n ;i++)
      scanf ("%d",&a[i]);
   low =0 ;  high =n-1;
   sort (low, high)
   printf("After sorting");
   for (i=0;i<n;i++)
   printf("%4d", a[i]);
   product();
   getch();
}
void sort (int low, int high)
{
   mid =(low+ high)/2;
   if (low<high)
   {
    sort( low,mid);
    sort (mid+1, high);
    merge (low,mid,high);
   }
```

```
void merge(int low, intmid, int high)
{
 int l1, intl2
 for(l1=0, l2=mid, i=0, l1<=mid, & l2<=high; i++)
 {
  if(a[l1]<a[l2])
     b[i]=a[l1++];
  else
     b[i]=a[l2++];
 }
  while(l1<=mid)
    b[i++]=a[l1++];
  while(l2<=high)
    b[i++)=a[l2++];
   for(i=0; i<b; i++)
     a[i]=b[i];
 }
 void product();
  { int p=1;
     int k=1;
        printf("Enter k);
         scanf("%d",&k);
         for(i=0; i<=k; i++)
         {
           p=p*i;
```

3) Discuss Insertion sort and Selection sort with examples.

Insertion Sort

The data is sorted by insertion the data into an exciting sorted file, the process followed is elements are known before while locating to place then is searched.

Best case complexity is o(n)

eg of Insertion sort

7 4 5 2

4 7 5 2

4 5 7 2

2 4 5 7

Selection sort

The data is sorted by inserting and placing the consecutive elements is sorted location

The best case complexity is o(n^2)

Example

17 6 3 13 6

↓ ↓

m l

3 16 17 13 6

3 6 17 13 16

3 6 13 17 16

3 6 13 16 17

4. Sort the array using bubble sort where elements are taken from the user and display the elemen

i) in alternate order

ii) sum of elements in odd position and product of elements in even position

iii) Elements which are divisible by m where m is taken from the user

```
#includ <stdio.h>
int main()
{
  int a[100]; n;c,d,swap;
  printf("Enter size");
  scanf("%d",&n);
  Printf("Enter elements");
  for (c=0 ; c<n; c++);
  {
   Scan f ("%d",&a[c]);
  }
  for(c=0; c<n-1; c++)
  {
  for(d=0;d<n-c-1; d++)
  {
  if(a[d]>a[d+1])
  {
   swap=a[d];
    a[d]=a[d+1];
    a[d+1]=swap;
   }
  }
 }
 printf("bubblesort")
 for( c==0;c<n;c++)
 {
  printf("%d", a[c]);
 }
1) printf ("alternateelements");
   for (c > 0, c <= n , c+ =2)
   {
      printf("% d", a [c]);
   }
   int sum = 0; p = 1;
2) for (c = 1; c <= n; c+ =2
   {
      p = p*a [c];
   }
   for (c = 0; c <= n; c+ = 2)
    {
      s = s + a[c];
    }
   printf ("sum product = %d %d", sum, p);
3)
    int m;
    printf ("Enter m");
    scanf ("%d", &m);
    for (c = 0; c <= n ; c++)
     { if( a[c] % m = = 0)
       {
         printf ( "%d", a[c]);
       }
       else
       printf ("Notfound");
```

5) Write a recursive program to implement binary search?

```
#include <stdio.h>
int BS(int a[] , int f, int l, int e)
    if (l >=f)
    {
     int m = (f+ l)/2 ;
        if [a[m] == e)
        {
         return m;
        }
        if (a[m] >el
        { return BS(a, f, m-1, e);
        }
       return BS (a, m+1, l, e);
      }
      return -1;
    int main (void)
    {
      int a[] = {1, 4, 3, 2, 9}
      int n=5;
      int e=9;
      int p = BS(a, 0, n-1, e);
      if (p = = -1)
      { printf ("Notfound")
      } else
      {
       printf ("Found at %d", p);
      }
    }
```