Assignment No. 1

**TITLE : Sorting and Searching Algorithms**

Name : METHIKA M Date : 07/08/2025

UNo : UIT2024936

Class: IT- I DIV

Batch : I2  
  
**SOURCE CODE**

#include <stdio.h>

int accept(int fa[],int fn);

int display(int fa[],int fn);

int linearSearch(int fa[], int fn, int fns);

int bubbleSort(int fa[], int fn);

int binarySearch(int fa[], int fn, int fns);

int menu(void);

int accept(int fa[],int fn)

{

for (int i=0;i<fn;i++)

{

printf("\nEnter element %d: ",i+1);

scanf("%d",&fa[i]);

}

return 0;

}

int display(int fa[],int fn)

{

printf("The array is: ");

for (int i=0;i<fn;i++)

{

printf("%d ",fa[i]);

}

return 0;

}

int linearSearch(int fa[], int fn, int fns)

{

int i=0;

int flag=1;

for (i=0;i<fn;i++)

{

if (fa[i]==fns)

{

flag=0;

}

}

return flag;

}

int bubbleSort(int fa[], int fn)

{

for (int i=0;i<(fn-1);i++)

{

for (int j=0;j<(fn-1-i);j++)

{

if (fa[j]>fa[j+1])

{

int temp=fa[j];

fa[j]=fa[j+1];

fa[j+1]=temp;

}

}

}

return 0;

}

int binarySearch(int fa[], int fn, int fns)

{

int low=0;

int high=(fn-1);

int mid= (low+high)/2 ;

int flag=0;

while (low <=high)

{

if (fns==fa[mid])

flag=1;

if (fns<fa[mid])

high=mid-1;

else

low=mid+1;

mid=(low+high)/2;

}

return flag;

}

int menu(void)

{

int choice=0;

do

{

printf("\nMENU OPERATIONS: \n");

printf("\n1. Linear Search \n2. Bubble Sort \n3. Binary Search \n0. Exit\n");

printf("\nWhat operation would you like to perform? ");

scanf("%d",&choice);

}while(choice<0 || choice>3);

return choice;

}

int main()

{

int n=0;

int found=0;

printf("\nEnter how many elements you want in array? ");

scanf("%d",&n);

printf("\nEnter the elements: \n");

int a[n];

accept(a,n);

display(a,n);

int ch=0;

do

{

ch=menu();

switch(ch)

{

case 1:

int ns=0;

printf("\nWhich element do you w

ant to search? ");

scanf("%d",&ns);

found= linearSearch(a,n,ns);

if (found==0)

{

printf("\nThe number %d is found in the array\n",ns);

}

else

{

printf("\nThe number %d is not found in the array\n",ns);

}

break;

case 2:

bubbleSort(a,n);

printf("\nThe sorted array is: ");

for (int i=0;i<n;i++)

{

printf("%d ",a[i]);

}

break;

case 3:

bubbleSort(a,n);

printf("\nWhich element do you want to search? ");

scanf("%d",&ns);

found= binarySearch(a,n,ns);

if (found==1)

{

printf("\nThe number %d is found in the array\n",ns);

}

else

{

printf("\nThe number %d is not found in the array\n",ns);

}

break;

case 0:

printf("\nThank you! ");

break;

}

}while(ch!=0);

return 0;

}

**OUTPUT**

