***Assignment No. 5***

Accept mobile user information (e.g. Mobile No, Name, Bill amount)

1. Display the data in descending order of Mobile No. (insertion sort).

2. Display data in ascending order of name (selection sort).

3. Display details of Mobile no specified by user (Binary search).

4. Display the number of passes and comparisons for different test cases (Worst, Average, Best case).

Roll No:66

Batch: - S3

#include <math.h>

#include <stdio.h>

#include <string.h>

#include <stdlib.h>

typedef struct mobile

{

long mobileno;

char name[20];

float billamt;

}mobile;

void read(mobile st[],int n);

void print(mobile st[],int n);

int binsearch(mobile st[],long mobileno,int n);

void insertionsort(mobile a[],int n); //sort in descending order on MobileNo

void selectionsort(mobile a[],int n);

int main()

{

mobile st[30];

int n,i,ch,pos;

long mobileno;

do

{

printf("\n1)create\n2)print");

printf("\n3)Display the data in descending order of mobileno(insertion sort)");

printf("\n4)Display the data in ascending order of name(selection sort)");

printf("\n5)Display details for mobileno specified by user(binary search)");

printf("\n6)Quit");

printf("\nEnter Your Choice:");

scanf("%d",&ch);

switch(ch)

{

case 1: printf("\nEnter No. of Users :");

scanf("%d",&n);

read(st,n);

break;

case 2: print(st,n);

break;

case 3: insertionsort(st,n);

print(st,n);

break;

case 4: selectionsort(st,n);

print(st,n);

break;

case 5: printf("\nPlease ensure that data is sorted using option no.3");

printf("\nEnter Mobile number : ");

scanf("%ld",&mobileno);

pos=binsearch(st,mobileno,n);

if(pos==-1)

printf("\nNot found");

else

{

printf("\n Found at location=%d",pos+1);

printf("\n %s\t%ld\t%6.2f",st[pos].name,st[pos].mobileno,st[pos].billamt);

}

break;

case 6:

exit(0);

break;

default: printf("Invalid choice");

break;

}

}while(ch!=6);

}

int binsearch(mobile st[],long mobileno,int n)

{

int i,j,k,comp=0;

i=0;

j=n-1;

while(i<=j)

{

k=(i+j)/2;

comp++;

if(mobileno==st[k].mobileno)

{

printf("\nNo. of comparisons = %d ",comp);

return(k);

}

else

if(mobileno > st[k].mobileno)

j=k-1;

else

i=k+1;

}

printf("\nNo. of comparisons = %d ",comp);

return(-1);

}

void print(mobile st[],int n)

{

int i;

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

printf("\n%20s %15ld %6.2f",st[i].name,st[i].mobileno,st[i].billamt);

}

void read(mobile st[],int n)

{

int i;

float billamt;

long mobileno;

printf("\n enter data(name mobile No.(9 disgits max) Bill Amount ): ");

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

{

scanf("%s%ld%f",st[i].name,&mobileno,&billamt);

st[i].billamt=billamt;

st[i].mobileno=mobileno;

}

}

void insertionsort(mobile a[],int n)

{

int i,j,k,passes=0,comp=0;

mobile temp;

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

{

passes++;

temp=a[i];

for(j=i-1;j>=0 && a[j].mobileno < temp.mobileno;j--)

{

comp++;

a[j+1]=a[j];

}

a[j+1]=temp;

}

printf("\nPasses = %d\t Comparisons = %d",passes,comp);

}

void selectionsort(mobile a[],int n)

{

int i,j,k,passes=0,comp=0;

mobile temp;

for(i=0;i<n-1;i++)

{

passes++;

k=i;

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

{

comp++;

if(strcmp(a[j].name,a[k].name)< 0 )

k=j;

}

temp=a[i];

a[i]=a[k];

a[k]=temp;

}

printf("\nPasses = %d\t Comparisons = %d",passes,comp);

}

---------------OUTPUT---------------

1)create

2)print

3)Display the data in descending order of mobileno(insertion sort)

4)Display the data in ascending order of name(selection sort)

5)Display details for mobileno specified by user(binary search)

6)Quit

Enter Your Choice:1

Enter No. of Users :5

enter data(name mobile No.(9 disgits max) Bill Amount ): Abhi 895675238 6000

Ashwin 684319758 8000

Pankaj 864952675 7000

Sanket 956387624 8500

Sudershan 587623698 105

1)create

2)print

3)Display the data in descending order of mobileno(insertion sort)

4)Display the data in ascending order of name(selection sort)

5)Display details for mobileno specified by user(binary search)

6)Quit

Enter Your Choice:3

Passes = 4 Comparisons = 4

Sanket 956387624 8500.00

Abhi 895675238 6000.00

Pankaj 864952675 7000.00

Ashwin 684319758 8000.00

Sudershan 587623698 105.00

1)create

2)print

3)Display the data in descending order of mobileno(insertion sort)

4)Display the data in ascending order of name(selection sort)

5)Display details for mobileno specified by user(binary search)

6)Quit

Enter Your Choice:4

Passes = 4 Comparisons = 10

Abhi 895675238 6000.00

Ashwin 684319758 8000.00

Pankaj 864952675 7000.00

Sanket 956387624 8500.00

Sudershan 587623698 105.00

1)create

2)print

3)Display the data in descending order of mobileno(insertion sort)

4)Display the data in ascending order of name(selection sort)

5)Display details for mobileno specified by user(binary search)

6)Quit

Enter Your Choice:5

Please ensure that data is sorted using option no.3

Enter Mobile number : 587623698

No. of comparisons = 3

Found at location=5

Sudershan 587623698 105.00

1)create

2)print

3)Display the data in descending order of mobileno(insertion sort)

4)Display the data in ascending order of name(selection sort)

5)Display details for mobileno specified by user(binary search)

6)Quit

Enter Your Choice:6