Sorting and Searching Mechanisms:

Sorting Mechanisms:

General Approach:

1)input:5

elements:7 8 10 2 5

Output:2 5 7 8 10

#include<stdio.h>

int main()

{

int a[100],n,i,j,temp;

scanf("%d",&n);

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

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

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;

}

}

}

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

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

return 0;

}

2)Swapping of two numbers using addition.

#include<stdio.h>

int main()

{

int a=10,b=20;

printf("\n a=%d and b=%d",a,b);

a=a+b;

b=a-b;

a=a-b;

printf("\n a=%d and b=%d",a,b);

return 0;

}

3)Swapping of two numbers using XOR operator.

#include<stdio.h>

int main()

{

int a=10,b=20;

printf("\n a=%d and b=%d",a,b);

a=a^b;

b=a^b;

a=a^b;

printf("\n a=%d and b=%d",a,b);

return 0;

}

4)Swapping of two numbers using addition.

#include<stdio.h>

int main()

{

int a=10,b=20;

while(b!=0)

{

a++;

b--;

}

printf("%d",a);

return 0;

}

Bubble Sort:

1)input:6

Elements:6 5 4 3 2 1

Output:1 2 3 4 5 6

#include<stdio.h>

int main()

{

int a[100],n,i,j,temp;

scanf("%d",&n);

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

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

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

{

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

{

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

{

temp=a[j];

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

a[j+1]=temp;

}

}

}

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

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

return 0;

}

Selection Sort:

1)input:6

Elements:1 23 5 7 9 6

Output:1 5 6 7 9 23

#include<stdio.h>

int main()

{

int a[100],n,i,j,temp,min;

scanf("%d",&n);

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

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

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

{

min=i;

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

{

if(a[j]<a[min])

min=j;

}

temp=a[i];

a[i]=a[min];

a[min]=temp;

}

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

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

return 0;

}

Insertion Sort:

1)input:5

Elements:5 6 3 2 1 4

Output:1 2 3 4 5 6

#include<stdio.h>

int main()

{

int a[100],n,i,j,temp;

scanf("%d",&n);

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

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

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

{

temp=a[i];

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

{

a[j]=a[j-1];

}

a[j]=temp;

}

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

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

return 0;

}

Searching Mechanisms:

Linear Search:

1)input:5

24 56 78 100 2

100

Output:4

#include<stdio.h>

int main()

{

int a[100],n,i,flag=0,key;

scanf("%d",&n);

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

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

scanf("%d",&key);

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

{

if(a[i]==key)

{

printf("%d",i+1);

flag=1;

}

}

if(flag==0)

printf("-1");

return 0;

}

Binary Search:

1)input:6

1 2 3 4 5 6

Output:3

3 is found at 3 position

#include<stdio.h>

int main()

{

int a[100],n,i,flag=0,key,low,high,mid;

scanf("%d",&n);

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

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

scanf("%d",&key);

low=0;

high=n-1;

mid=(low+high)/2;

while(low<=high)

{

if(key==a[mid])

{

printf("%d is found at %d position",key,mid+1);

flag=1;

break;

}

else if(key>a[mid])

low=mid+1;

else

high=mid-1;

mid=(low+high)/2;

}

if(flag==0)

printf("%d is not found",key);

return 0;

}

Swapping two numbers by call by value:

#include<stdio.h>

void swap(int x,int y);

int main()

{

int a=10,b=20;

printf("\n values before swapping\n");

printf("a=%d and b=%d",a,b);

swap(a,b);

printf("\n values after swapping\n");

printf("a=%d and b=%d",a,b);

return 0;

}

void swap(int x,int y)

{

int temp;

temp=x;

x=y;

y=temp;

}

Swapping two numbers by call by reference:

#include<stdio.h>

void swap(int \*x,int \*y);

int main()

{

int a=10,b=20;

printf("\n values before swapping\n");

printf("a=%d and b=%d",a,b);

swap(&a,&b);

printf("\n values after swapping\n");

printf("a=%d and b=%d",a,b);

return 0;

}

void swap(int \*x,int \*y)

{

int temp;

temp=\*x;

\*x=\*y;

\*y=temp;

}