**8. Sorting and Searching**

**a.Write a C program that uses non recursive function to search for a Key value in a given list of integers using linear search method.**

#include<stdio.h>

void main()

{

int i, a[20], n, key, flag = 0;

printf("Enter the size of an array \n");

scanf("%d", &n);

printf("Enter the array elements\n");

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

{

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

}

printf("Enter the key elements");

scanf("%d", &key);

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

{

if(a[i] == key)

{

flag = 1;

break;

}

}

if(flag == 1)

printf("The key elements is found at location %d", i + 1);

else

printf("The key element is not found in the array");

}

**Output**

**b. Write a C program that uses non recursive function to search for a Key value in a given sorted list of integers using binary search method.**

#include<stdio.h>

void main()

{

int a[20], i, n, key, low, high, mid;

printf("enter n value");

scanf("%d",&n);

printf("Enter the array elements in ascending order");

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

{

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

}

printf("Enter the key element\n");

scanf("%d", &key);

low = 0;

high = n - 1;

while(high >= low)

{

mid = (low + high) / 2;

if(key == a[mid])

break;

else

{

if(key > a[mid])

low = mid + 1;

else

high = mid - 1;

}

}

if(key == a[mid])

printf("The key element is found at location %d\n", mid + 1);

else

printf("the key element is not found");

}

**Output**

**c. Write a C program that implements the Bubble sort method to sort a given list of integers in ascending order.**

#include<stdio.h>

void main()

{

int n, a[20], temp, i, j;

printf("Enter the size of the array\n");

scanf("%d", &n);

printf("Enter the array elements\n");

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

{

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

}

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

{

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

{

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

{

temp = a[j];

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

a[j + 1] = temp;

}

}

}

printf("The sorted array is\n");

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

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

}

**Output**

**d. Write a C program that sorts the given array of integers using selection sort in descending order**

#include<stdio.h>

void main()

{

int n, a[20], min, temp, i, j;

printf("Enter the size of the array\n");

scanf("%d", &n);

printf("Enter the array elements\n");

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

{

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

}

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

}

printf("The sorted array is\n");

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

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

}

**Output**

**e. Write a C program that sorts the given array of integers using insertion sort in ascending order**

#include <stdio.h>

int main()

{

int n, array[1000], i, j, t;

printf("Enter number of elements\n");

scanf("%d", &n);

printf("Enter %d integers\n", n);

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

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

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

j = i;

while ( j > 0)

{

if(array[j-1] > array[j]) {

t = array[j];

array[j] = array[j-1];

array[j-1] = t;

}

j--;

}

}

printf("Sorted list in ascending order:\n");

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

printf("%d\n", array[i]);

}

return 0;

}

**Output**

**f. Write a C program that sorts a given array of names**

#include<stdio.h>

#include<string.h>

int main(){

int i,j,count;

char str[10][10],temp[10];

printf("No of strings to be entered:");

scanf("%d",&count);

printf("Enter the Strings one by one: ");

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

scanf("%s",&str[i]);

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

for(j=i+1;j<count;j++){

if(strcmp(str[i],str[j])>0)

{

strcpy(temp,str[i]);

strcpy(str[i],str[j]);

strcpy(str[j],temp);

}

}

printf("Order of Sorted Strings are:\n");

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

puts(str[i]);

return 0;

}

**Output**