**PROGRAM-0**

**LINEAR AND BINARY SEARCH**

#include <stdio.h>

#include<stdlib.h>

#include<time.h>

int array[100];

int search,c,n,i,j;

int number;

void linear\_search()

{

printf("numbers in the array are:\n");

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

{

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

}

printf("Enter the number to be searched\n");

scanf("%d",&search);

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

{

if(array[j]==search)

{

printf("The element is present in the array at position-%d\n",(j+1));

break;

}

}

if(j==n)

{

printf("The number is not present\n");

}

}

void binary\_search()

{

int c, first, middle, last;

int temp;

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

{

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

{

if (array[i] > array[j])

{

temp = array[i];

array[i] = array[j];

array[j] = temp;

}

}

}

printf("numbers...\n");

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

{

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

}

printf("Enter the element to be searched\n");

scanf("%d",&search);

first=0;

last=n-1;

middle = (first+last)/2;

while (first <= last) {

if (array[middle] < search)

first = middle + 1;

else if (array[middle] == search) {

printf("%d found at location %d.\n", search, middle+1);

break;

}

else

last = middle - 1;

middle = (first + last)/2;

}

if (first > last)

printf("Not found! %d isn't present in the list.\n", search);

}

int main()

{

int choice;

clock\_t start,end;

double tm;

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

scanf("%d",&n);

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

{

number=rand()%100;

array[i]=number;

}

while(1)

{

printf("\nenter 1.for linear search\n 2. for binary search\n ");

scanf("%d",&choice);

switch(choice)

{

case 1:start=clock();

linear\_search();

end=clock();

tm=((double)(end-start))/CLOCKS\_PER\_SEC;

printf("the time taken by linear search=%1f\n",tm);

break;

case 2:start=clock();

binary\_search();

end=clock();

tm=((double)(end-start))/CLOCKS\_PER\_SEC;

printf("the time taken by binary search=%1f\n",tm);

break;

}

}

return 0;

}