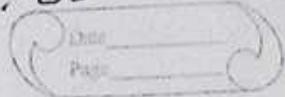


8/2/26

## Experiment No :- 02



Implementation of linear search and binary search.

@ binary search :-

```
#include <stdio.h>
```

```
int linearSearch(int arr[], int n, int key, int i) {
```

```
    if (i == n) {
```

```
        return -1;
```

```
}
```

```
    if (arr[i] == key) {
```

```
        return i;
```

```
}
```

```
    linearSearch(arr, n, key, i+1);
```

```
}
```

```
int main() {
```

```
    printf("Enter the total number of elements to  
be entered :- ");
```

```
    int n;
```

```
    scanf("%d", &n);
```

```
    int arr[n];
```

```
    printf("Enter %d elements :- ", n);
```

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

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

```
}
```

```
int key;
```

```
printf("Enter the number to be searched :- ");
```

```
scanf("%d", &key);
```

```
int res = linearSearch(arr, n, key, 0);
```

```
(res == -1) ? printf("Element not found") :
```

```
printf("%d is found at index %d and  
position %d", key, res, res+1);
```

```
}
```

Output :-

Enter the total number of elements to be entered :- 5

Enter 5 elements :- 10 20 30 40 50

Enter the number to be searched :- 20

20 is found at index 1 and position 2.

(b) Binary Search :-

```
#include <stdio.h>
```

```
int binarySearch(int arr[], int s, int e, int key);
```

```
if (s > e) {
```

```
    return -1;
```

```
}
```

```
int mid = (s + e) / 2;
```

```
if (arr[mid] == key) {
```

```
    return mid;
```

```
}
```

```
if (arr[mid] > key) {
```

```
    binarySearch(arr, s, mid - 1, key);
```

```
else {
```

```
    binarySearch(arr, mid + 1, e, key);
```

```
}
```

```
void arrayPrint(int arr[], int n) {
```

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

```
        printf("%d ", arr[i]);
```

```
        if (i == n - 1) {
```

```
            printf(", ");
```

```
}
```

```
printf("\n");
```

```
}
```

```
int main()
{
    printf("Enter the total number of elements  
to be entered :- ");
}
```

```
int n;
```

```
scanf("%d", &n);
```

```
int arr[n];
```

```
printf("Enter %d elements :- ", n);
```

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

```
    scanf("%d", &arr[i]);
}
```

```
}
```

```
printf("The entered array is :- ");

```

```
arrayPrint(arr, n);

```

```
for (int i = 1; i < n; i++)
{
    
```

```
    int key = arr[i];

```

```
    int j = i - 1;

```

```
    while (j >= 0 && arr[j] > key)
    {
        
```

```
        arr[j + 1] = arr[j];
    }

```

```
    j--;
}
```

```
}
```

```
arr[i + 1] = key;

```

```
3

```

```
printf("After sorting the array become:- ");

```

```
arrayPrint(arr, n);

```

```
int key;

```

```
printf("Enter the number to be searched:- ");

```

```
scanf("%d", &key);

```

```
int res = binarySearch(arr, 0, n - 1, key);

```

```
(res == -1) ? printf("Element not found") :

```

```
printf("%d is found at index %d and  
position %d", key, res, res + 1);

```

```
3

```

Output:-

Enter the total number of elements  
to be entered :- 5

Enter 5 elements :- 20 30 40 10 50

The entered array is :- 20, 20, 30, 40, 50

After sorting the array become :- 10, 20,  
30, 40, 50

Enter the number to be searched :- 30

30 is found at index 2 and position 3