EXPERIMENT 1.2

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Semester: 3rd **Subject Name: DS**

Aim of the practical: WRITE A PROGRAM TO DEMONSTRATE THE USE OF LINEAR AND BINARY SEARCH TO FIND A GIVEN ELEMENT IN AN ARRAY.

Program Code:-

```
#include <bits/stdc++.h>

using namespace std;

int main(void)

{


   int n;

   cout << "enter number of elements: ";

   cin >> n;

   int a[n];

   cout << "enter elements of array: ";

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

   {

      cin >> a[i];

   }

   while (1)


   {

      int val, pos = -1;

      cout << "1. Linear search\n2. Binary search\n3. exit\nenter your response: ";

      int x;
```

```
cin >> x;
if (x == 1)
{
   cout << "enter value: ";
   cin >> val;
   for (int i = 0; i < n; i++)
   {
      if (a[i] == val)
      {
         pos = i;
         break;
      }
   }
   if (pos == -1)
   {
      cout << "Not Found" << endl;
   }
   else
   {
      cout << "Found at position " << pos + 1 << endl;
   }
}
else if (x == 2)
{
   cout << "enter value: ";
   cin >> val;

   int lb = 0, ub = n - 1;
   int mid = (lb + ub) / 2;
```

```
    while (a[mid] != val && lb <= ub)
    {
        mid = (lb + ub) / 2;
        if (a[mid] == val)
        {
            pos = mid;
        }
        else if (a[mid] < val)
        {
            lb = mid + 1;
        }
        else
        {
            ub = mid - 1;
        }
    }
    if (pos == -1)
    {
        cout << "Not Found" << endl;
    }
    else
    {
        cout << "Found at position " << pos + 1 << endl;
    }
}
else
{
    return 0;
}
```

```
  }
}
```

Output:-

```
enter number of elements: 5
enter elements of array: 1 2 3 4 5
1. Linear search
2. Binary search
3. exit
enter your response: 1
enter value: 3
Found at position 3
1. Linear search
2. Binary search
3. exit
enter your response: 2
enter value: 2
Found at position 2
1. Linear search
2. Binary search
3. exit
enter your response:
```

Learning outcomes (What I have learnt):

1.I have learn about Liner and Binary search.

2.I have learn about Array.

3.I have learn about how to demonstrate the use of the linear and binary search to find a given element in an array.

Evaluation Grid :

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.	Student Performance (Conduct of experiment) objectives/Outcomes.		12
2.	Viva Voce		10
3.	Submission of Work Sheet (Record)		8
	Total		30