MCA Semester 1	Subject : Advanced Data Structures Lab
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Roll No. : MCA2511	Date : 03-10-2025

1. Program to perform Linear Search on an array of numbers.

Code:

05LinSearch.java

```
import java.util.Scanner;

class LinSearch
{
	public static void main(String[] args)
	{
		int num, i, key;
		boolean flag = false;
		Scanner input = new Scanner(System.in);

		System.out.println("Enter the number of the integers: ");
		num = input.nextInt();

		int array[] = new int[num];
		System.out.println("Enter "+num+" integers");
		for(i=0; i<num; i++)
		{
			array[i] = input.nextInt();
		}

		System.out.println("Enter the key: ");

		key = input.nextInt();

		//Linear Search
		for(i=0; i<num;i++)
		{
			if(array[i] == key)
			{
				flag = true;
				System.out.println(key + " is present at index " + i);
				break;
			}
		}
		if(flag == false)
		{
			System.out.println(key + " is not present in the array");
		}
```

```
        }//end of pvsm
}//end of class
```

Output:

```
C:\Users\mcamock\Desktop\MCA2511>javac 05LinSearch.java


C:\Users\mcamock\Desktop\MCA2511>java LinSearch
Enter the number of the integers:
6
Enter 6 integers
12
4
3
5
8
1
Enter the key:
78
78 is not present in the array

C:\Users\mcamock\Desktop\MCA2511>java LinSearch
Enter the number of the integers:
4
Enter 4 integers
12
485
8
3
Enter the key:
8
8 is present at index 2
```

2. Program to perform Binary Search on an array of numbers.

Code:

041BinSearch.java

```
import java.util.Scanner;

class BinSearch
{
	public static void main(String[] args)
	{
		int num, i, key, first, last, mid;
		boolean flag = false;

		Scanner input = new Scanner(System.in);

		System.out.println("Enter the number of integers: ");
		num = input.nextInt();

		int array[] = new int[num];
		System.out.println("Enter "+num+" integers in Ascending order:");
		for (i=0; i<num; i++)
		{
			array[i] = input.nextInt();
		}

		System.out.println("Enter the key: ");
		key = input.nextInt();

		//Binary Search
		first = 0;
		last = num-1;
		mid = (first+last)/2;

		while(first<=last)
		{
			if(key<array[mid])
			{
				last = mid-1;
			}
			else if(key>array[mid])
			{
				first = mid+1;
			}
			else //data found
			{
				System.out.println(key + " found at index "+mid);
				flag = true;
				break;
			}
			mid = (first+last)/2;
		}//end of while
```

```
                if(flag == false)
                {
                        System.out.println(key + " is not found");
                }
        }//end of psvm
}//end of class
```

Output:

```
C:\Users\mcamock\Desktop\MCA2511>javac 041BinSearch.java

C:\Users\mcamock\Desktop\MCA2511>java BinSearch
Enter the number of integers:
10
Enter 10 integers in Ascending order:
23
25
28
29
34
35
36
45
58
61
Enter the key:
45
45 found at index 7
```

```
C:\Users\mcamock\Desktop\MCA2511>java BinSearch
Enter the number of integers:
9
Enter 9 integers in Ascending order:
12
13
18
40
46
48
99
102
111
Enter the key:
55
55 is not found
```