DATA STRUCTURE

Lab Programs:

**1.Linear Search:**

#include <stdio.h>

int main() {

    int n, target;

    printf("Enter the number of elements in the array: ");

    scanf("%d", &n);

    int arr[n];

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

    for (int i = 0; i < n; i++) {

        scanf("%d", &arr[i]);

    }

    printf("Enter the number you want to search for: ");

    scanf("%d", &target);

    int found = 0;

    for (int i = 0; i < n; i++) {

        if (arr[i] == target) {

            printf("Element %d found at index %d.\n", target, i);

            found = 1;

            break;

        }

    }

    if (!found) {

        printf("Element %d not found in the array.\n", target);

    }

    return 0;

}

**2.Binary Search:**

#include <stdio.h>

int main() {

    int n, target;

    printf("Enter the number of elements in the sorted array: ");

    scanf("%d", &n);

    int arr[n];

    printf("Enter %d sorted elements:\n", n);

    for (int i = 0; i < n; i++) {

        scanf("%d", &arr[i]);

    }

    printf("Enter the number you want to search for: ");

    scanf("%d", &target);

    int left = 0;

    int right = n - 1;

    int found = 0;

    while (left <= right) {

        int mid = left + (right - left) / 2;

        if (arr[mid] == target) {

            printf("Element %d found at index %d.\n", target, mid);

            found = 1;

            break;

        } else if (arr[mid] < target) {

            left = mid + 1;

        } else {

            right = mid - 1;

        }

    }

    if (!found) {

        printf("Element %d not found in the array.\n", target);

    }

    return 0;

}

**3.Addition of 3 numbers and split it if > 9.**

#include <stdio.h>

int main() {

    int num1, num2, num3;

    printf("Enter three numbers: ");

    scanf("%d %d %d", &num1, &num2, &num3);

    int sum = num1 + num2 + num3;

    while (sum > 9) {

        int tempSum = 0;

        while (sum > 0) {

            tempSum += sum % 10;

            sum /= 10;

        }

        sum = tempSum;

    }

   printf("The final result is: %d\n", sum);

    return 0;

}