8. Write a program that searches for a specific number in a pre-initialized array. The number to be searched is taken as input from the user, and the program prints an appropriate message indicating whether the number is found or not.

Description:

This program searches for a specific number in a pre-initialized array.
- The array is already defined with some numbers.
- The user enters the number to be searched.
- The program scans the array using a simple linear search technique.
- If the number is found, it displays a success message along with its position.
- If the number is not found, it prints a failure message.

Example:

arr[] = {10, 25, 30, 45, 50}

Enter the number to search: 30

Number 30 found at position 3.

Algorithm:

Step 1: Start

Step 2: Declare an integer array arr[] with pre-initialized values and variables n, i, found = 0.

Step 3: Display the contents of the array for reference.

Step 4: Prompt the user to enter the number to search (n) and store it in n.

Step 5: Perform a linear search:
- Use a loop to traverse the array from index i = 0 to the last index.
- If arr[i] == n, set found = 1 and print the position (i+1 for 1-based index).
- Exit the loop.

Step 6: If found is still 0, print "Number not found in the array."

Step 7: Stop.

Source Code:

```c
#include <stdio.h>

int main() {
    int arr[] = {10, 20, 30, 40, 50, 60, 70, 80, 90, 100}; // Pre-
initialized array
    int size = sizeof(arr) / sizeof(arr[0]); // Calculate array size
    int num, i, found = 0;

    // Taking input from the user
    printf("Enter a number to search: ");
    scanf("%d", &num);

    // Linear search algorithm
    for (i = 0; i < size; i++) {
        if (arr[i] == num) {
            found = 1;
            printf("Number %d is found at index %d.\n", num, i);
            break;
        }
    }
    // Printing the result if not found
    if (!found) {
        printf("Number %d is not found in the array.\n", num);
    }

    return 0;
}
```

Sample Output:

```
Enter a number to search: 70

Number 70 is found at index 6


Enter a number to search: 5

Number 5 is not found in the array
```