Problem:6

Given a sorted array **arr[]** of size N and a number **X**, you need to find the number of occurrences of **X** in given array.

Ans:

Code:

```
#include <stdio.h>
int findFirstOccurrence(int arr[], int n, int x) {
    int left = 0, right = n - 1;
    int firstIndex = -1;
 while (left <= right) {
        int mid = left + (right - left) / 2;
  if (arr[mid] == x) {
            firstIndex = mid;
            right = mid - 1;
        } else if (arr[mid] < x) {
            left = mid + 1;
        } else {
            right = mid - 1;
        }
    }
    return firstIndex;
}
int findLastOccurrence(int arr[], int n, int x) {
    int left = 0, right = n - 1;
    int lastIndex = -1;
    while (left <= right) {  int mid = left + (right - left) / 2;
   if (arr[mid] == x) {
            lastIndex = mid;
            left = mid + 1;
        } else if (arr[mid] < x) {
            left = mid + 1;
  } else {
            right = mid - 1;
        }
    }
    return lastIndex;
}
int countOccurrences(int arr[], int n, int x) {
    int first = findFirstOccurrence(arr, n, x);
    if (first == -1) {
        return 0;
    }
  int last = findLastOccurrence(arr, n, x);
    return last - first + 1;
}
int main() {
    int arr[] = {1, 1, 2, 2, 2, 2, 3};
    int n = sizeof(arr) / sizeof(arr[0]);
    int x = 2;
 int count = countOccurrences(arr, n, x);
    printf("The number of occurrences of %d is: %d\n", x, count);

    return 0;
}
```