






1. Write a function in C++ that implements the binary search algorithm. The function should take a sorted array of integers and a target value, and return the index of the target value in the array. If the target is not found, return -1. 

2. Modify your binary search function to use recursion instead of a loop. The function signature might look like this:

```
int binarySearchRecursive(int arr[], int left, int right, int target); 
```

3. Write a function that uses binary search to find the first and last occurrence of a given target value in a sorted array of integers. If the target is not found, return -1. 
4. Use binary search to count the number of occurrences of a given target value in a sorted array of integers. 
5. Given a rotated sorted array, write a function to find the minimum element using binary search. 
6. A peak element in an array is an element that is greater than its neighbors. Write a function to find a peak element using binary search. Assume the array does not have duplicate elements. 