Exercise Sheet $n°1$: **Functions & Procedures**

Note: Implement a program in C to test each function.

Exercise 1. Write a function called `removeDuplicates` that takes an array of integers and returns a new array with duplicate values removed.

Example:

```
Input: [1, 2, 2, 3, 4, 4, 5]
Output: [1, 2, 3, 4, 5]
```

Exercise 2. Write a function called `sortArray` that takes an array of integers and sorts it in ascending order. The sorting works by repeatedly swapping adjacent elements if they are in the wrong order. The process continues until no more swaps are needed.

Example:

```
Input: [3, 1, 4, 5, 9, 2, 6]
Output: [1, 2, 3, 4, 5, 6, 9]
```

Exercise 3. Write a function called `rotateArray` that takes an array of integers and a number `k`, then rotates the array `k` positions to the right.

Example:

```
Input: [1, 2, 3, 4, 5], k = 2
Output: [4, 5, 1, 2, 3]
```

Exercise 4. Write a function called `binarySearch` that takes a sorted array of integers and a target integer, and returns the index of the target if it exists in the array, otherwise returns `-1`. The search works by repeatedly dividing the array into halves and checking whether the middle element is the target. If the target is smaller, the search continues in the left half; if larger, it continues in the right half. This process repeats until the target is found or there are no more elements left to check.

Example:

```
Input: [1, 2, 3, 4, 5, 6], target = 4
Output: 3

Input: [1, 2, 3, 4, 5, 6], target = 7
Output: -1
```