Competitive Programming Training

Binary Search

Demo

```java
public int binary_search(int[] numbers, int query){
    int low = 0, high = numbers.length - 1;

    while(low < high){
        int mid = (low + high) / 2;

        if (query < numbers[mid]){
            high = mid - 1;
        } else if (query > numbers[mid]){
            low = mid + 1;
        } else {
            //Found
            return mid;
        }
    }

    //Not Found
    return -1;
}
```

Properties of Binary Search

- ➔ Divides the array in half in each iteration, recalculates the range based on response
- ➔ Only works on sorted arrays (sorting -> O(N logN))
- ➔ Searches for elements in O(log N) time
- ➔ Requires no auxiliary memory (unlike BST)
- ➔ Usually used with hashing in contests

Practice Problems

- ➔ bssjudge.tk
- ➔ Select “Binary Search” Assignment
- ➔ 2 Problems