UNIT TEST
USING JUNIT 5

Lets create Unit tests for a Leetcode Problem

Agenda

- Leetcode Problem and Solution
- Setup For Unit Tests On IntelliJ
- Unit Tests Using Junit 5
- 100% Test coverage & HTML Report

Leetcode Problem & Solution

Leetcode Problem

26. Remove Duplicates from Sorted Array

Easy | Topics | Companies | Hint

Given an integer array `nums` sorted in **non-decreasing order**, remove the duplicates **in-place** such that each unique element appears only **once**. The **relative order** of the elements should be kept the **same**. Then return *the number of unique elements in* `nums`.

Consider the number of unique elements of `nums` to be `k`, to get accepted, you need to do the following things:

- Change the array `nums` such that the first `k` elements of `nums` contain the unique elements in the order they were present in `nums` initially. The remaining elements of `nums` are not important as well as the size of `nums`.
- Return `k`.

Custom Judge:

The judge will test your solution with the following code:

```
int[] nums = [...]; // Input array
int[] expectedNums = [...]; // The expected answer with correct length

int k = removeDuplicates(nums); // Calls your implementation

assert k == expectedNums.length;
for (int i = 0; i < k; i++) {
    assert nums[i] == expectedNums[i];
}
```

If all assertions pass, then your solution will be **accepted**.

Leetcode Solution

Code

Java Auto

```java
public class Solution {
    public int removeDuplicates(int[] nums) {
        // Handle edge cases: if the input array is null or empty
        if (nums == null || nums.length == 0) {
            return 0;
        }
        // Initialize the pointer for the unique elements
        int j = 1;

        // Iterate through the array starting from the second element
        for (int i = 1; i < nums.length; i++) {
            // If the current element is not equal to the previous one,
            // it means it is a unique element
            if (nums[i] != nums[i - 1]) {
                nums[j] = nums[i];
                j++;
            }
        }
        // Return the number of unique elements
        return j;
    }
}
```

Lets Setup for Unit tests on Intellij!

Setup For Unit Test On IntelliJ

Prerequisite: Download and Install IntelliJ, Maven and JDK 1.8 or higher

Step 1: Create a new project on InteliJ

Step 2: Select Build as Maven and JDK - 1.8 or Higher

Step 3: Create a package under the src/main/java directory and then create a java class and paste the Leetcode solution in it

Lets Write Unit tests using JUnit5

Unit tests using JUnit5

The solution includes unit tests using JUnit 5 to cover:
- Basic functionality
- Edge cases
- Null and empty arrays
- Arrays with no duplicates

Explanation

Test Class setUp & cleanUp:

- `setUp` method with `@BeforeAll` annotation to run setup before all tests.
- `cleanUp` method with `@AfterAll` annotation to run cleanup after all tests.

Nested Class for Tests:

- `RemoveDuplicatesTests` nested class to group tests related to the removeDuplicates method.

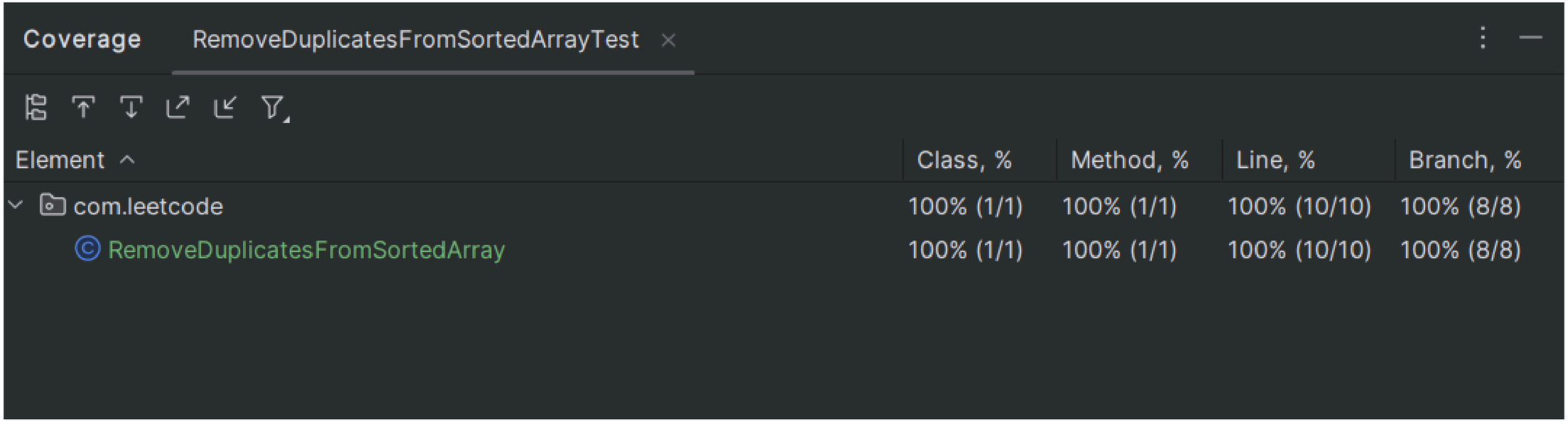
Test Methods:

- `should_ReturnCorrectCountAndModifiedArray_When_DuplicatesPresent`: Tests cases where the array has duplicates.
- `should_ReturnZero_When_ArrayIsEmpty`: Tests the case where the array is empty.
- `should_ReturnOne_When_ArrayHasOneElement`: Tests the case where the array has one element.
- `should_ReturnOne_When_AllElementsAreSame`: Tests the case where all elements in the array are the same.
- `should_ReturnCorrectCountAndModifiedArray_When_AllElementsAreUnique`: Tests the case where all elements in the array are unique.
- `should_ThrowIllegalArgumentException_When_ArrayIsNull`: Tests that an IllegalArgumentException is thrown when the array is null.
- `should_ReturnCorrectCountAndModifiedArray_When_ArrayIsLarge`: Tests the case where the array is large and contains many duplicates.

Lets run the Test coverage and generate a HTML report!

Test Coverage

The unit tests achieve 100% code coverage for the `RemoveDuplicatesFromSortedArray` class, including all methods, lines, and branches, as shown in the coverage report.



HTML Report

Current scope: all classes | com.leetcode

Coverage Summary for Package: com.leetcode

Package	Class, %	Method, %	Branch, %	Line, %
com.leetcode	100% (1/1)	100% (2/2)	100% (8/8)	100% (11/11)

Class	Class, %	Method, %	Branch, %	Line, %
RemoveDuplicatesFromSortedArray	100% (1/1)	100% (2/2)	100% (8/8)	100% (11/11)

Thank you!