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LeetCode – Maximum Product Subarray (Java)

Find the contiguous subarray within an array (containing at least one number) which has the largest product.

For example, given the array [2,3,-2,4], the contiguous subarray [2,3] has the largest product = 6.

Java Solution - Dynamic Programming

This is similar to [maximum subarray](#). Instead of sum, the sign of number affect the product value.

When iterating the array, each element has two possibilities: positive number or negative number. We need to track a minimum value, so that when a negative number is given, it can also find the maximum value. We define two local variables, one tracks the maximum and the other tracks the minimum.

```
public int maxProduct(int[] nums) {
    int[] max = new int[nums.length];
    int[] min = new int[nums.length];

    max[0] = min[0] = nums[0];
    int result = nums[0];

    for(int i=1; i<nums.length; i++){
        if(nums[i]>0){
            max[i]=Math.max(nums[i], max[i-1]*nums[i]);
            min[i]=Math.min(nums[i], min[i-1]*nums[i]);
        }else{
            max[i]=Math.max(nums[i], min[i-1]*nums[i]);
            min[i]=Math.min(nums[i], max[i-1]*nums[i]);
        }

        result = Math.max(result, max[i]);
    }

    return result;
}
```

Time is $O(n)$.

You May Also Like ...

1. [LeetCode - Maximum Subarray \(Java\)](#)
2. [LeetCode - Maximum Gap \(Java\)](#)
3. [LeetCode - Maximum Product of Word Lengths \(Java\)](#)
4. [LeetCode - Minimum Size Subarray Sum \(Java\)](#)

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If you want someone to read your code, please put the code inside `<pre><code>` and `</code></pre>` tags. For example:

```
<pre><code>
String foo = "bar";
</code></pre>
```



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