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Leetcode Solutions

Leetcode Solutions

Wednesday, September 24, 2014

[Leetcode] Maximum Product Subarray

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`.

Analysis:

Let p be the product of all numbers in the array.

If *p > 0*, the largest product is p.

If p == 0, there must be at least one 0 in the array. The array should be something like [x1, 0, x2, 0, x3...], where *x1, x2, x3* is a subarray containing no 0s. So, the largest product is maximum of largest product of x1, x2, x3 and 0. We can iterate the array and maintain the product of numbers and reset the product to be 1 when an 0 encountered.

If p < 0, there must be odd number of negative elements. The array should be something like [x1, -y1, x2, -y2, x3...], where *x1, x2, x3* is a subarray containing no negative numbers. Since the number of negative element is odd in the array, product of x1 and product of [x2, -y2, x3, ...] must be positive and could be the potential largest product. Product of x1 could be calculated by iterating x1 and product of [x2, -y2, x3, ...] could be calculated by reverse iterating.

Thus, the largest product must be the product of subarray between 0s (if there are 0s) and the left and right subarray of the negative elements.

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```
int maxProduct(int A[], int n) {
    int maxProd = INT_MIN;
    int prod = 1;
    for(int i=0; i <n; i++)
    {
        prod = prod * A[i];
        maxProd = max(maxProd, prod);
        if (A[i] == 0)
            prod = 1;
    }

    prod = 1;
    for(int i=n-1; i >=0; i--)
    {
        prod = prod * A[i];
        maxProd = max(maxProd, prod);
        if (A[i] == 0)
            prod = 1;
    }

    return maxProd;
}
```

Posted by Leetcode Solution at 12:55 AM  Recommend this on Google

2 comments:

Anonymous November 16, 2014 at 1:37 AM

How about this?
for (i = 0; i < n; i++)
{
A = cur_pos * arr[i];
B = cur_neg * arr[i];

cur_pos = max(A,B,arr[i]);
cur_neg = min(A,B,arr[i]);

if (max_product < cur_pos)
max_product = cur_pos;

}

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Write a program to find the node at which the intersection of two singly linked lists begins. For example, the following two linked list...

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