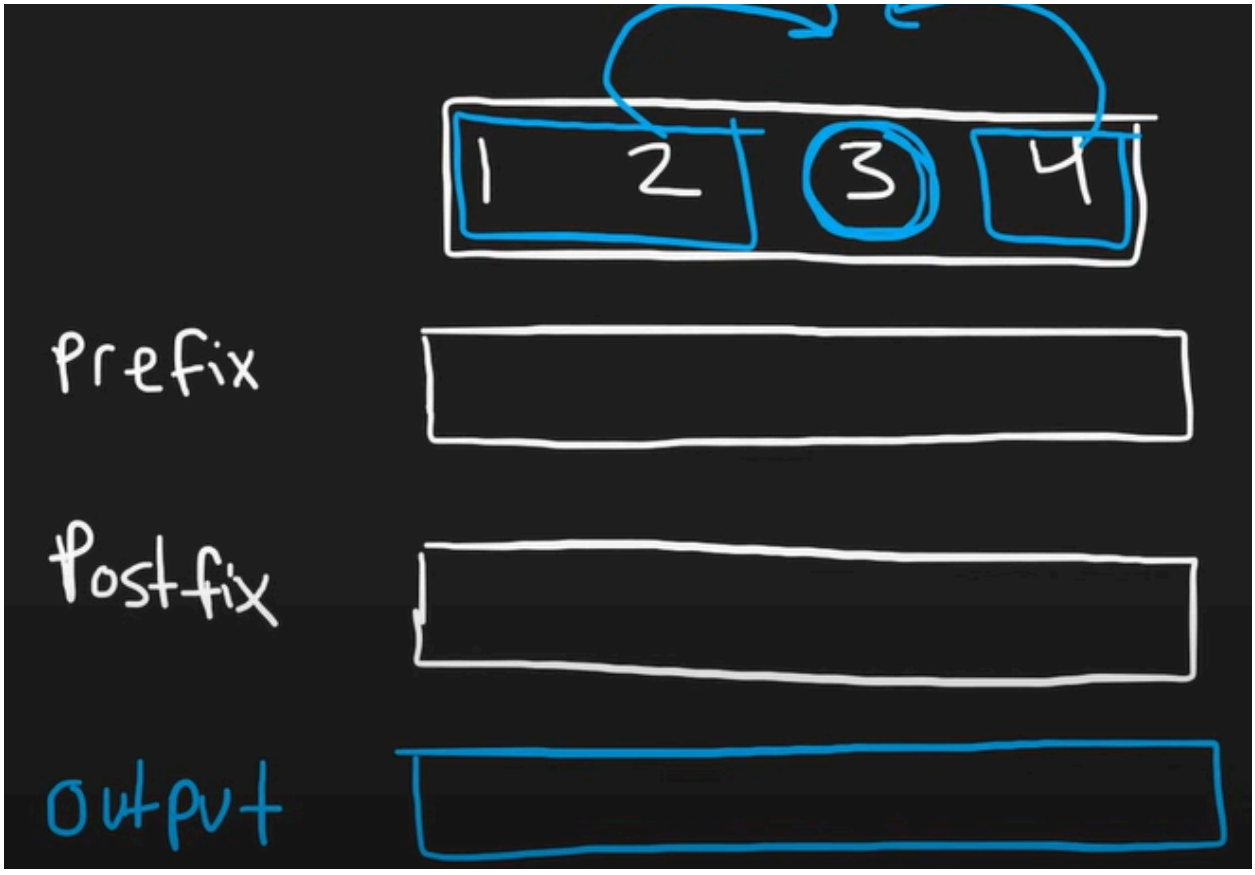
238. Product of Array Except Self

Initial thought:

1. Can solve this question using brute force which gives O(n^2)
2. 2nd approach is to just divide the product of the array with its element at index I

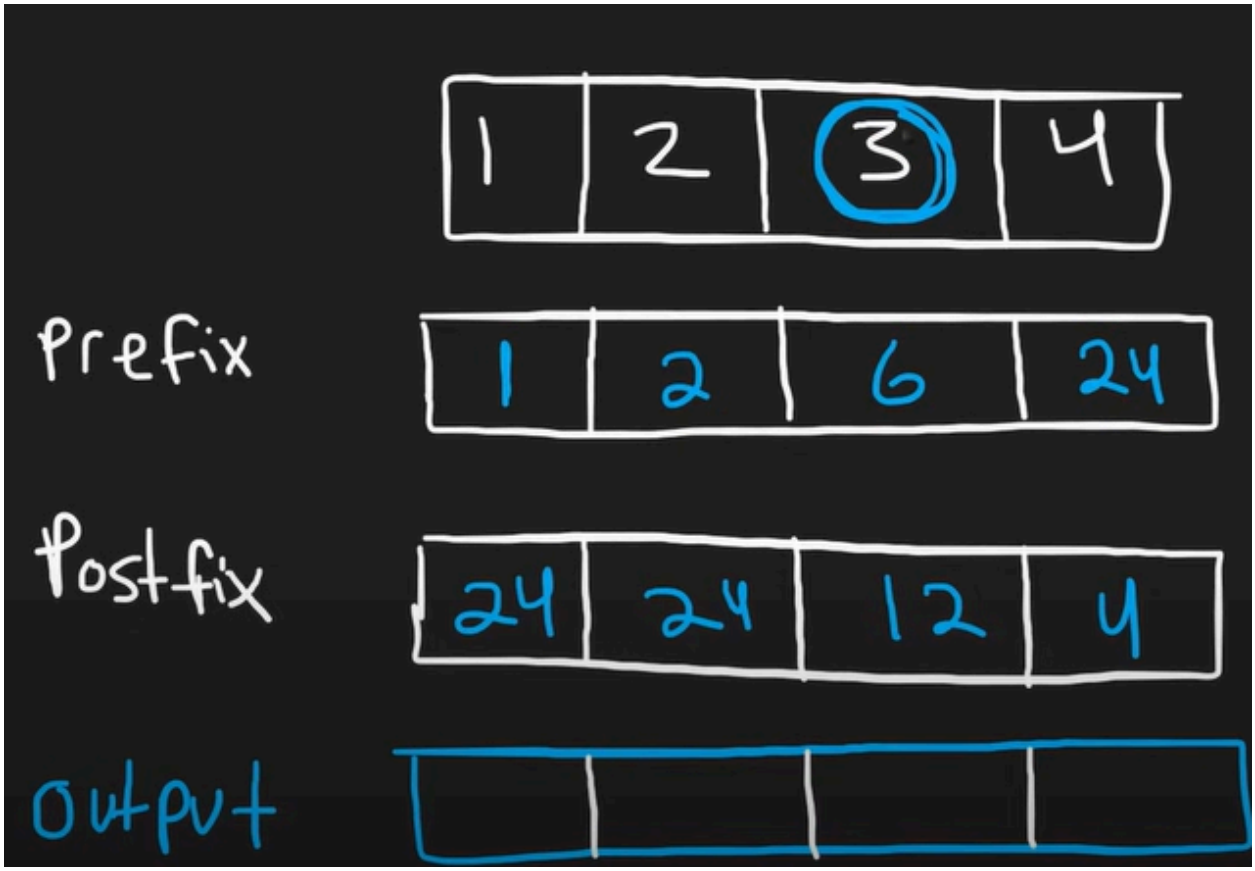
Optimized Solution

1. So here we'll multiply the prefix values of an element and postfix values of an element in the array..and later multiply prefix and postfix



2. Here we'll take the some extra memory and calculate prefix and postfix for each element

3. example



4. From above..prefix of 1 is 1…prefix of 2 is 2*1….prefix of 3 is 3*2*1 and prefix of 4 is 4*3*2*1
5. Similary postfix of 4 is 4*1…..postfix of 3 is 3*4….similarly for 2 and 1 see pic

```
A = [1,2,3,4]
prefix = []
postfix = []
p = 1
p1 = 1
for i in range(len(A)):
    p = p*A[i]
    prefix.append(p)
    p1 = p1*A[-1-i]
    postfix.append(p1)

postfix = postfix[::-1]


for i in range(len(A)):
    if i == 0:
        A[i] = postfix[i+1]
    elif i == len(A)-1:
        A[i] = prefix[i-1]
    else:
        A[i] = prefix[i-1] * postfix[i+1]

print(A)
```

6. Got prefix and postfix ...now just need to multiply prefix[i-1] * postfix[i+1]
7.