Products of array except self - using prefix and suffix (optimal)

```
class Solution:
    def prod_of_array(self, nums: list[int]) -> list[int]:

        result = [1] * len(nums)

        prefix = 1
        for i in range(len(nums)):
            result[i] = prefix
            prefix *= nums[i]
        postfix = 1
        for i in range(len(nums)-1, -1, -1):
            result[i] *= postfix
            postfix *= nums[i]
        return result

print(Solution().prod_of_array(nums=[1,2,4,6]))
```

Step 1:

self -> solution instance

nums -> [1,2,4,6]

result -> [1,1,1,1]

prefix -> 1

Step 2:

```
for i in range(len(nums)):
    result[i] = prefix
    prefix *= nums[i]
```

Iterations:

1st => i -> 0

result[0] -> 1

prefix -> 1 * 1

result = [1, , ,] (0 1 2 3)

2nd => i -> 1

result[1] -> 1

prefix -> 1 * 2

result = [1, 1, ,] (0 1)

3rd => i -> 2

result[2] -> 2

prefix -> 2 * 4

result = [1, 1, 2,] (0 1 2)

last => i -> 3

result[3] -> 8

postfix -> 8 * 6 => 48

result = [1, 1, 2, 8] (0 1 2 3)

Step 3:

postfix -> 1

Step 4:

for i in range(len(nums) - 1, -1, -1):

result[i] *= postfix

postfix *= nums[i]

nums = [1, 2, 4, 6]

Iterations:

1st. i -> 3

result[3] -> 8 * 1

postfix -> 1 * 6

result = [1, 1, 2, 8] (3)

2nd. i -> 2

result[2] -> 2 * 6

postfix -> 6 * 4

result = [1, 1, 12, 8] (2)

3rd. i -> 1

result[1] -> 1 * 24

result = [1, 24, 12, 8] (1)

postfix -> 24 * 2

4th. i -> 0

result[0] -> 1 * 48

postfix -> 48 # 1

result = [48, 24, 12, 8]