Daily Coding Problem

Good morning! Here's your coding interview problem for today.

This problem was asked by Uber.

Given an array of integers, return a new array such that each element at index `i` of the new array is the product of all the numbers in the original array except the one at `i`.

For example, if our input was `[1, 2, 3, 4, 5]`, the expected output would be `[120, 60, 40, 30, 24]`. If our input was `[3, 2, 1]`, the expected output would be `[2, 3, 6]`.

Follow-up: what if you can't use division?

Follow-up, can't use division

$I = [i_0, i_1, i_2, \ldots, i_n]$

$O = [o_0, o_1, o_2, \ldots, o_n]$ s.t. $o_k = (\prod i)/i_k$

F.U.: $O = [1]$

$O = [i_1, i_0]$

$O = [i_1 i_2, i_0 i_2, i_0 i_1]$

$O = [1, 1, 1, \ldots, 1]$ $\Pi = 1$

$O = [1, i_0, i_0, \ldots, i_0]$ $\Pi = i_0$

$O = [i_1, i_0, i_0 i_1, \ldots, i_{01}]$ $\Pi = i_0 i_1$

$O = [i_1 i_2, i_0 i_2, i_0 i_1, \Pi, \ldots, \Pi]$ $\Pi = i_0 i_1 i_2$

start w/ $O = [1]$; $\Pi = 1$ → $O = [\,]$, $\Pi = 1$

$i_0 \rightarrow$ (1) ~~update Π, push Π~~

$i_1 \rightarrow$ ~~update Π, multiply all elems (except last) by i_1, push Π~~
multiply all elems by i_1, push Π, update Π