

Burst Balloons

You are given N balloons, indexed from 0 to $n - 1$. Each balloon is painted with a number on it represented by an array **arr**. You are asked to burst all the balloons.

If you burst the **i**th balloon, you will get $\text{arr}[i - 1] * \text{arr}[i] * \text{arr}[i + 1]$ coins. If $i - 1$, or $i + 1$ goes out of bounds of the array, consider it as if there is a balloon with a **1** painted on it.

Return the **maximum** coins you can collect by bursting the balloons wisely.

Example 1:

Input:

$N = 4$

$\text{arr}[] = \{3, 1, 5, 8\}$

Output: 167

Explanation:

$\text{arr}[] = \{3, 1, 5, 8\} \rightarrow \{3, 5, 8\} \rightarrow \{3, 8\} \rightarrow \{8\} \rightarrow \{\}$

$\text{coins} = 3 * 1 * 5 + 3 * 5 * 8 + 1 * 3 * 8 + 1 * 8 * 1 = 167$

Example 2:

Input:

$N = 2$

$\text{arr}[] = \{1, 10\}$

Output: 20

Your Task:

You don't need to read input or print anything. Your task is to complete the function **maxCoins()** which takes the array of integers **arr** and **N** as parameters and returns the maximum coin you can collect.

Expected Time Complexity: $O(N * N * N)$

Expected Auxiliary Space: $O(N * N)$

Constraints:

$$1 \leq N \leq 300$$

$$0 \leq \text{arr}[i] \leq 100$$