

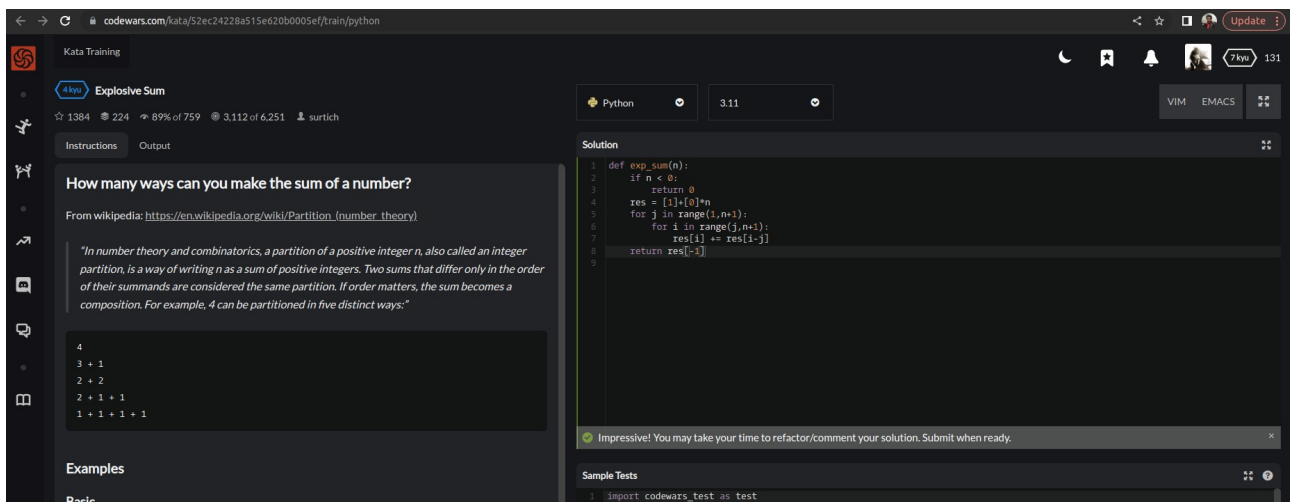
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Explosive Sum

DESCRIPTION:

In number theory and combinatorics, a partition of a positive integer n , also called an *integer partition*, is a way of writing n as a sum of positive integers. Two sums that differ only in the order of their summands are considered the same partition. If order matters, the sum becomes a composition. For example, 4 can be partitioned in five distinct ways:

SOLUTION :



The screenshot shows the Codewars interface for the 'Explosive Sum' kata. On the left, the problem description is visible, including a Wikipedia link and a list of partitions for the number 4: 4, 3+1, 2+2, 2+1+1, and 1+1+1+1. The main area displays a Python solution. The solution uses a dynamic programming approach with a list 'res' of size n+1. It iterates from 1 to n, and for each i, it iterates from 1 to i, updating res[i] by adding res[i-j]. The final result is res[-1]. A green message at the bottom says 'Impressive! You may take your time to refactor/comment your solution. Submit when ready.' Below the solution, there is a 'Sample Tests' section with a test case: 'import codewars_test as test'.

```
1 def exp_sum(n):
2     if n < 0:
3         return 0
4     res = [1]+[0]*n
5     for j in range(1,n+1):
6         for i in range(j,n+1):
7             res[i] += res[i-j]
8     return res[-1]
```

EXPLANATION:

The given function `exp_sum(n)` takes an integer n as input and computes the number of ways in which n can be expressed as a sum of positive integers. The variable `res` is initialized to a list of length $n+1$, where the first element is 1 and the rest are 0. The element `res[i]` represents the number of ways to partition i using positive integers. The outer loop of the function iterates over the integers from 1 to n , and the inner loop iterates over the integers from j to n . For each value of i , the value of `res[i]` is updated by adding the value of `res[i-j]`, which represents the number of ways to partition $i-j$ using positive integers no greater than j . The final value of `res[-1]` is returned, which represents the number of ways to partition n .