

## Problem



## Compute

$$S = 1^3 + 2^3 + \dots + 100^3$$



## LLMs

## LLM Rollout

## LLM Classifier

## Advantage Calculation

Solution 1

Solution 2

Solution 3

Solution 4

Solution 5

Solution 6

Group 1

Group 2

Group 3

Generate multiple  
solutions

### Geometric Packing:

pack into a cube of  
 $\text{side } 1 + \dots + n \Rightarrow S$   
 $= (1 + \dots + n)^3$

Lowest  
Advantage  
(wrong and common)

### Finite Differences

Telescopin: express  
 $k^3$  from  $(k+1)^4 - k^4$ ,  
then cancel.

Higher  
Advantage  
(rare and correct)

### Combinatorial Decomposition:

express  $k^3$  with  $\binom{k}{r}$ ,  
sum by hockey-stick.

Lower  
Advantage  
(correct but common)

Combining Quality and Creativity

Policy Optimization