G: Gyrating Glyphs

Problem Author: Reinier Schmiermann

- **Problem:** Reverse engineer the ≤ 20000 operators using ≤ 1400 queries:

$$f_n(a_0, \ldots, a_n) := (\ldots(((a_0 \operatorname{op}_1 a_1) \operatorname{op}_2 a_2) \operatorname{op}_3 a_3) \ldots \operatorname{op}_n a_n) \bmod 10^9 + 7$$

Statistics: 14 submissions, 0 accepted, 10 unknown

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- Example with 30 operators:

Recover last 15 operators:

???...??	???...???	Ops
$\underbrace{000\ldots000}_{16}$	$q_1 q_2 \ldots q_{15}$	Query 1

$+0$ and $\times 1$ do not change the query outcome.

Continue with the next 15 operators.

???...??	$\cancel{+ \times + \ldots + \times}$	Ops
$0 q_1 \ldots q_{15}$	$\cancel{010\ldots01}$	Query 2

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- If not, repeat with a new random query.