

The Small Short. ¹ You are day trading the GME stock. The price of GME throughout the day is encoded in array $A[1, n]$, i.e., $A[i]$ is the price of GME at time $1 \leq i \leq n$. You can either buy or sell a single stock of GME at each timestep. There is a selling fee $S > 0$ but no buying fee. Find the maximum profit you can achieve, making as many buy/sell transactions as you like.

¹“Look at them, that’s my quant. - Your what? - My quantitative. My math specialist. Look at them, you notice anything different about them? Look at their face. Look at their grit, I’ll give you a hint, they’re a 381 student. They won a national math competition in Indiana! They don’t even speak Hoosier! Yeah I’m sure of the math.”

I Can't Lie, Justin Has All of Her Songs Downloaded. ² Saylor Twift is getting ready to have another world tour, starting in West Lafayette, Indiana³. She wants to make as much money as possible utilizing a predatory pricing scheme: on some days she will sell low, and on some days, she will sell high.

There are n seats and the concert will happen in T days. On each day $1 \leq t \leq T$, you must choose to set the ticket prices to the *low price* p_L or the *high price* p_H . On any given day,

- If you choose the high price p_H , then the number of purchase requests will be H_t .
- If you choose the low price, then the number of purchase requests will be L_t , where $L_t \geq H_t$ since any buyer who'd buy a high price ticket would also buy a low price ticket.

You are required to fulfill all purchase requests as long as seats remain available. Ticket sales end when all n seats are filled or after $t = T$, i.e., the departure date has been reached. Find the maximum profit you can make.

²This is a lie - Justin

³This is true; a liar never lies twice but sometimes thrice.