3. Practice (`har`)

1 sec / 3 sec 40 points

John practiced for N days in preparation for the olympiad. He solved X_i tasks on day i.

After the olympiad he wanted to know whether there was a span of consecutive days when he solved exacly Y tasks. In other words, are there integers a and b such that $1 \leq a \leq b \leq N$ and $X_a + X_{a+1} + \ldots + X_b = Y$?

Write a program to help John answer that question.

Input. The first line of input contains N, the number of days ($1 \leq N \leq 1\,000$), and M, the number of questions ($1 \leq M \leq 1\,000\,000$).

The second line contains N space-separated integers X_i ($0 \leq X_i \leq 1\,000$, where $1 \leq i \leq N$), the numbers of tasks John solved each day.

The third line contains M space-separated integers Y_j ($1 \leq Y_j \leq 1\,000\,000$, where $1 \leq j \leq M$), the numbers of tasks in John's questions.

Output. Output M lines, one per question. On the line j output the word '`JAH`', if there exists a span of consecutive days when John solved exactly Y_j tasks, or the word '`EI`', if there's no such span of days.

Example.

Input	Output
3 4 1 2 3 2 7 5 4	JAH EI JAH EI

John solved 2 tasks on the seocnd day, so the answer to the first question is 'JAH'. As he only solved 6 tasks in total, the answer to the second question is obviously 'EI'. From the second to the third day, he solved $2 + 3 = 5$ tasks, so the answer to the third question is 'JAH'. As there is no span of consecutive days when he solved 4 tasks in total, the answer to the last question is 'EI'.

Grading. In the first set of test cases, worth a total of 8 points, $N \leq 20$ and $M \leq 1\,000$. In the next set, worth another 8 points, $N \leq 100$ and $M \leq 1\,000$. In the next set, worth yet another 8 points, $M \leq 1\,000$. In the next set, worth yet another 8 points, $N \leq 100$. In the last set (the remaining 8 points), there are no additional constraints.