Matching items

1 second, 256 MB

Let's celebrate! The most famous shop announces a promotion for the end of year 2021. If you buy some item from the shop, you would get another item for free, but the other item's price should not be too high (determined by a lottery ticket that you pick when paying for the first item).

There are **N** items at this shop (**1** <= **N** <= **100,000**). For **1** <= **i** <= **N**, the price of item **i** is $\mathbf{P_i}$ baht. The items are ordered by prices, i.e., $\mathbf{P_i} < \mathbf{P_{i+1}}$, for **1** <= **i** < **N**.

The promotion rule is the following. When a customer buy an item **x**, that customer can pick a lottery ticket that contains a number **y**. The price of the free item that the customer would get must be **<u>at most</u>** $\mathbf{P_x} + \mathbf{y}$.

There are **Q** customers. Customer **j** buys item $\mathbf{X_j}$ (where **1** <= $\mathbf{X_j}$ <= **N**) and pick a lottery ticket with number **Yj**. You want to find, for each customer, the most expensive item they can get for free under this promotion. It is possible that the customer get the same item $\mathbf{X_j}$ for free.

Suppose that the shop sales 6 items with the following prices:

10, 30, 50, 55, 100,130

Suppose that there are 3 customers with the following information.

j	$\mathbf{X_j}$	$\mathbf{Y_j}$
1	1	40
2	3	49
3	5	10

Under the described rule, the most expensive item customer 1 could get is item 3 (of price 50 <= 10+40), customer 2 could get item 4 (55 <= 50+49), and customer 3 could get item 5 (100 <= 100+10). Note that customer 3 gets the same item for free.

Input

First line of the input contains two integer **N** and **Q** (2 <= **N** <= 100,000; 1 <= **Q** <= 100,000). There are 30% of test cases where **N** <= 1,000 and **Q** <= 1,000.

The next line contains a list of N integers $\mathbf{P_1}$ $\mathbf{P_2}$ … $\mathbf{P_N}$ (1 <= $\mathbf{P_1}$ < $\mathbf{P_2}$ < .. < $\mathbf{P_N}$ <= 1,000,000,000).

The next **Q** lines describe the customer information. More specifically, for 1 <= j <= Q, line **2+j** contains two integers $\mathbf{X_j}$ and $\mathbf{Y_j}$ (1<=$\mathbf{X_j}$<=N; 0 <= $\mathbf{Y_j}$ <= 900,000,000).

Output

The output contains **Q** lines. Each line **j**, for 1 <= **j** <= **Q**, contains an integer which is the index of the most expensive items customer **j** can get.

Example

Input	Output
6 3 10 30 50 55 100 130 1 40 3 49 5 10	3 4 5