Cambridge

The admission interview at the prestigious University of Cambridge consist of ***N*** tasks, numbered from ***1*** to ***N***. Alex is there right now, waiting to attend the interview. Takahiro Wong, who has just finished his interview, solved all the tasks. More precisely, he solved the ***i-th*** problem after $\mathbf{D}_i$ seconds from the beginning of the interview.

Knowing the fact that he can solve the ***i-th*** problem in $\mathbf{T}_i$ seconds, Alex asks himself ***M*** questions: **x y**. For every question, Alex will consider only the tasks from the interval **[x;y]** and he wants to know whether he can solve **each of these tasks** before Takahiro Wong. (Alex can solve the tasks from the interval **[x;y]** in any order).

For example, let's consider that Alex has to solve the tasks **a** and **b** (in this order). He will finish task **a** after $\mathbf{T}_a$ seconds, and task **b** after $\mathbf{T}_a + \mathbf{T}_b$ seconds. Alex will solve both problems before Takahiro Wong if $\mathbf{T}_a < \mathbf{D}_a$ and $\mathbf{T}_a + \mathbf{T}_b < \mathbf{D}_b$.

Both Takahiro Wong and Alex will start their interviews at second **0**.

Help Alex answer correctly to all ***M*** questions

STANDARD INPUT

- The first line of the standard input will contain ***N*** and **M**.
  N - the number of tasks, ***M*** - the number of questions.
- On the following N lines, there will be $\mathbf{T}_i$ and $\mathbf{D}_i$.
  $\mathbf{T}_i$ - the time needed for Alex to solve the **i-th** problem
  $\mathbf{D}_i$ - the time (from the beginning of his interview) after Takahiro Wong will solve the **i-th** problem.
- On the following ***M*** lines, there will be **x** and **y**, representing the interval **[x; y]**
  .

STANDARD OUTPUT

The standard output will contain ***M*** lines, the answers to the ***M*** questions.
The ***i-th*** line will contain:
1, if Alex cand solve all the tasks from the interval **[x;y]** before Takahiro Wond
0, otherwise.

RESTRICTIONS AND SUBTASKS

- $1 \leq T_i < D_i \leq 10^9$
- The $\mathbf{D}_i$ values are not distinct (there can be a value that appears multiple times)
- Alex can't solve 2 tasks in the same time, but Takahiro Wong can (The $\mathbf{D}_i$ values are not distinct).

Subtask	Points	Restrictions
1	15 points	$1 \leq N, M \leq 10$
2	25 points	$1 \leq N * M \leq 10^5$
3	15 points	$1 \leq N \leq 10^3$ $1 \leq M \leq 10^5$
4	45 pointss	$1 \leq N, M \leq 10^5$

EXEMPLE

Standard input	*Standard output*
4 3 1 10 14 18 2 7 10 12 3 4 2 4 1 3	0 0 1

Explanation:

The 3rd question refers to the interval **[1;3]**:

- There are 6 ways Alex can solve the tasks: (1,2,3), (1, 3, 2), (2, 1, 3), (2, 3, 1), (3, 1, 2), (3, 2, 1).
- If he solves the tasks in the order (1, 3, 2), we have to fulfill the following relations:

$T_1 < D_1$, $T_1 + T_3 < D_3$ si $T_1 + T_3 + T_2 < D_2$. We can see that all of them are true.

- Because Alex found at least one way to solve all the problems before Takahiro Wong, the answer is 1 for the third question.