Problem K. King of Hot Pot

Input file:	*standard input*
Output file:	*standard output*
Time limit:	4 seconds
Memory limit:	512 mebibytes

Little Q is enjoying hot pot together with Tangjz. There are n dishes of meat in the boiling water, labeled by $1, 2, \ldots, n$. The i-th dish of meat will be ready at moment a_i, and it will take Little Q b_i units of time to fully eat it. Little Q can start eating dish i at any moment $t \geq a_i$, and then he has to eat it until moment $t + b_i$. Little Q can't be eating more than one dish of meat at the same time.

Little Q is called "King of Hot Pot", and he wants to show off before Tangjz by fully eating k dishes of meat as soon as possible. The timer starts at moment 0. Please write a program to help Little Q, for each k independently ($1 \leq k \leq n$), find k dishes of meat and the order to eat them such that the total time before he fully eats k dishes is minimized. Note that any waiting time is also included in the answer.

Input

The first line contains a single integer T ($1 \leq T \leq 10\,000$), the number of test cases. For each test case:

The first line contains an integer n ($1 \leq n \leq 300\,000$) denoting the number of dishes of meat.

Each of the following n lines contains two integers a_i and b_i ($1 \leq a_i, b_i \leq 10^9$) describing a dish of meat.

It is guaranteed that the sum of all n is at most $1\,000\,000$.

Output

For each test case, output a single line containing n integers, the k-th ($1 \leq k \leq n$) of which is the minimum total time before Little Q can fully eat k dishes of meat.

Example

standard input	standard output
1 5 1 2 4 6 3 5 4 2 3 2	3 5 7 12 18