

4545 Multiprocessor Scheduling

There are two applications running on a multiprocessor machine. Each application i ($i = 1, 2$) consists of N procedures which are numbered from 1 to N and must be executed sequentially (in the order $1, \dots, N$). A procedure will be identified by a pair (i, j) , where $i = 1, 2$ identifies the application and $1 \leq j \leq N$ represents the index of the procedure in the sequence of procedures of the application i . A procedure (i, j) can only be executed on the processor $P(i, j)$ of the machine and its execution lasts for $D(i, j)$ seconds. We want to schedule the execution of the procedures of the two applications over the processors of the machine in such a way that the time moment when the last procedure finishes its execution (from any of the two applications) is minimum; this time moment is called *makespan*. We consider that the two applications are available for scheduling starting from the time moment 0. The schedule needs to obey the following rules:

- once the execution of a procedure (i, j) starts on the processor $P(i, j)$, we cannot interrupt it until the execution of the procedure ends
- we cannot execute multiple procedures on the same processor at the same time, but we can execute multiple procedures in parallel on different processors
- the execution of the procedure (i, j) ($2 \leq j \leq N$) starts either at the exact time moment tm when the procedure $(i, j - 1)$ finishes its execution or at any time moment after tm
- if a procedure begins its execution at time moment tm , then it will finish its execution at the time moment $tm + D(i, j)$

Write a program that, given the information regarding the procedures of the two applications, computes the minimum makespan.

Input

The first line of the input file contains the number T of test cases which are described next. The first line of a test case contains the number N ($1 \leq N \leq 300$) of procedures composing each of the two applications. Then, N lines follow, describing the first application. The j -th of these N lines contains two integers, separated by a blank: $P(1, j)$ and $D(1, j)$.

After this, other N lines follow, describing the second application. The j -th of these N lines contains two integers, separated by a blank: $P(2, j)$ and $D(2, j)$. We have $1 \leq P(i, j) \leq 10$ and $1 \leq D(i, j) \leq 15000$ ($i \leq 1, 2$; $1 \leq j \leq N$). Notice that we may have $P(i, j) = P(k, l)$ — this implies that the procedures (i, j) and (k, l) cannot be executed during overlapping time intervals (notice also that if $i = k$ this would not matter, as the procedures of the same application must be executed sequentially).

Output

The output file must contain exactly T lines with a single number each — the minimum makespan for the corresponding test from the input file. These answers must be printed in the order in which the test cases are given in the input file (i.e. the i -th line of the output file contains the answer to the i -th test case from the input file).

Sample Input

```
2
1
2 6
1 10
3
2 31
2 18
4 15
2 26
3 40
5 16
```

Sample Output

```
10
90
```