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Sommersemester 2017

## Woche 03 – (Adv.) Competitive Programming

Abgabe 08.05.2017 17:00 Uhr, ber das Judge-Interface

### Aufgabe 1 (election). (100 Points – 1 second timelimit)

Another election is soon to be held at HPI. To test a new security scheme that a few students came up with, the election is set up as follows: First, every student will cast their vote at a single computer (which obviously can only be used by one student at a time). The computer will print a verification ticket for each student, which they will drop into one of multiple collection containers. There are enough collection containers that in theory all students could drop of their verification tickets at the same time.

One of your professors now gave you the following challenge: Given a list of times each student took at the computer and how much time they needed to drop of their verification ticket, figure out the minimum amount of time the election could have taken.

To measure the efficiency of this new method, the professor wants you to perform this task for multiple data sets.

**Input** The first line contains  $n$  ( $0 \leq n \leq 400$ ), the number of data sets / test cases. Then, for each test case, there will be one line containing  $k$  ( $0 \leq k \leq 10000$ ), the number of students who took part in the election, followed by  $k$  lines, each containing two numbers  $a$  and  $b$  ( $0 < a, b \leq 2 \cdot 10^9$ )<sup>1</sup>.

**Output** For each data set, print one line containing the minimum amount of time the election has taken.

**Points** There are three groups of test sets:

- *easy*: For the first group worth 25 Points, you can assume, that  $n \leq 100$ ,  $k \leq 500$  and  $e \leq 10000$ .

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<sup>1</sup>The professor performed *very* accurate measurements

- *medium*: For the second group worth 35 Points, you can assume, that  $n \leq 200$ ,  $k \leq 1000$  and  $e \leq 100000$ .
- *hard*: For the third group of test sets worth 40 Points, there are no additional assumptions.

**Sample Input**

```
1
2
10 20
```

```
5 15
```

**Sample Output**

```
30
```