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Sommersemester 2017

## Woche 07 – (Adv.) Competitive Programming

Abgabe 05.06.2017 17:00 Uhr, über das Judge-Interface

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

Due to as of yet unknown reasons all HPI wireless routers have ceased to function. As an enterprising student you aim to profit as much as possible from this situation by selling the students LAN cables, so they can reconnect their laptops to the internet. Sadly you do not have the necessary funds to get started, however your friend decides to help you out: He gives you one very long LAN cable, which you can then cut up and sell the different parts of, according to a price table provided by your friend.

Since the students you sell to do not want to be clustered closely around the available LAN ports, they prefer long cables. As such you never sell a shorter cable for more than a longer cable. Due to the high demand, you can also assume that you will sell all your cables. The challenge for you is now, given the long cable and pricing table, to decide how to cut the cable to maximise your revenue.

As your friend has multiple different kinds of cables, you have to do this multiple times.

**Input** The first line contains  $n$  ( $0 \leq n \leq 100$ ), the number of different cables your friend has. For each cable there is one line containing  $t$  ( $0 < t \leq 100000$ ) and  $k$  ( $0 < k \leq 1000$ ) the total length of the cable and the number of entries in the pricing table, followed by  $k$  lines containing two integers  $l$  ( $0 < l \leq t$ ) and  $p$  ( $0 < p < 2^{32}$ ), the length and price of one cable type you may sell. A cable of length 1 is always included.

**Output** For every cable print the maximum revenue you can achieve.

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

- *easy*: For the first group worth 25 Points, you can assume, that  $k \leq 50$  and  $t \leq 1000$ .

- *medium*: For the second group worth 35 Points, you can assume, that  $k \leq 200$  and  $t \leq 20000$ .
- *hard*: For the third group of test sets worth 40 Points, there are no additional assumptions.

**Sample Input**

```
1
9 5
1 1
2 5
3 8
6 17
8 23
```

**Sample Output**

```
25
```