

## CMPUT 275 - Tangible Computing

### Morning Problem: Filling Glasses

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#### Description

There are  $n$  glasses arranged in a way such that you can fill each glass by overfilling some other glass. The exception is the 0-th glass that can be filled without overfilling another glass.

Each glass has a specific capacity that it must be filled to before it begins overflowing in to other glasses. We'd like to know how long it would take to fill the  $k$ -th glass given that we can pour 1 unit of water in  $t$  time.

#### Input

The first line of input will contain three space separated integers  $1 \leq n \leq 1,000$ ,  $0 \leq k \leq n-1$  and  $1 \leq t \leq 60$ , the number of glasses, the glass we are concerned with, and the time it takes to pour a unit of water.

Then follows  $n$  lines of input each containing two space separated integers. The  $i$ -th line specifies first the capacity of the  $i$ -th glass and second which glass must be filled before the  $i$ -th can be filled. Note, the 0-th line will always contain  $-1$  as the source.

#### Output

You should output a single line containing the exact amount of time it will take for the  $k$ -th glass to be filled.

#### Sample Input 1

```
5 3 5
3 -1
2 0
3 0
5 1
2 3
```

#### Sample Output 1

```
50
```

#### Explanation

First the 0-th glass must fill, this will take 15 units of time. Next the glasses in position 1 fills up taking an additional 10 units of time adding up to 25. After the glass at index 1 is done filling the glass at index 3 begins to fill taking an additional 25 units of time for a total of 50.

#### Sample Input 2

2	0	4
1	-1	
7	0	

### Sample Output 2

4
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### Explanation

The 0-th glass will fill directly from the source taking a total of 4 units of time.