

### 1. COVID Prediction+

The number of COVID patients increases in the following order.

Day-1 -> 1

Day-2 -> 1

Day-3 -> 2

Day-4 -> 4

Day-5 -> 7

Day-6 -> 13

Day-7 -> 24

You can expect the above sequence to be followed on each day. Given a day number you have to print the number of patients on that particular day.

Sample input -

9

Sample output -

81

(How large can the input be?)

### 2. City graph

You will be given a number of cities and their distances in an adjacency matrix. You have to find out the city which has the maximum difference between its outgoing distance and incoming distance. If there are multiple cities then print them in increasing order of their ID.

Sample input -

3

0 2 4

1 0 5

6 3 0

Sample output-

1

Explanation-

City ID has zero based indexing. For example for City-0, the outgoing distance will be  $2+4=6$  and incoming distance will be  $1+6=7$ . The difference will be  $6-7=-1$ . For City-1, outgoing distance is  $1+5=6$ , incoming distance is  $2+3=5$ . Difference will be  $6-5=1$ . For City-2 outgoing distance  $6+3=9$ , incoming distance  $4+5=9$ . Difference is  $9-9=0$ . Among -1, 1, and 0, 1 is the biggest. So 1 will be the answer.

### 3. Robots save...

There was a long description which I don't remember. Our goal is to travel to various shops and return. We have to use some vehicles. Some robots are used to lift the vehicle when it goes into a pothole. One robot can lift only one vehicle and can only be used once. You will be given the distances to various chalk and duster shops and the number of potholes in each path in a format of  $n \times 3$  matrix. And you'll have to find out the minimum number of robots required to drive back safely by crossing the potholes.

Sample input-

6 7

0 1 2

0 2 2

1 2 1

1 3 1

1 4 2

2 5 1

2 6 2

Sample output-

12

Explanation-

Here 1st column is the starting point of a path, 2nd column is the ending point and 3rd column is the number of potholes (can't exceed 2). "0" indicates the starting location. The number "6" is a value which will be required to find out the exact location of chalk shop and duster shop. So the formula is- Chalk shop is at  $6/2 = 3$  and Duster shop is at  $6-1=5$ . Now we have to travel from 0 to 3 and back to 0 to bring chalks i.e. 0 to 1 then 1 to 3. So the potholes crossed are  $2*(2+1) = 6$ . Then we have to travel from 0 to 5 and back to 0 to bring dusters i.e. 0 to 2 then 2 to 5. Potholes crossed are  $2*(2+1) = 6$ . Total  $6+6=12$ .

#### 4. Word count

Given a word, find out the number of words present after it having a given number of vowels. They should be in dictionary order and the words should be of a given length.

Sample input-

xv

2

1

Sample output-

10

Explanation-

xv is the given word. 2 is the required word length. 1 is the required number of vowels. In this case the answer is - ya, ye, yi, yo, yu, za, ze, zi, zo, zu. Total 10.

#### 5. Trap water

Given a matrix of towers you have to find out how much water you can trap.

Sample input-

```
. * * .  
* . * *  
* . *  
* . *  
* * * *
```

Sample output-

3

Explanation-

Here \* indicates the towers and . indicates absence of towers. So water can be trapped in . locations only. In this case we can trap water only in the locations [1][1],[2][1] and [2][2]. Answer is 3.

