



acm International Collegiate
Programming Contest



The 2010 ACM UCLA Distributed Programming Contest

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This problem set contains 4 problems; pages are numbered from 1 to 5.



Problem A

Area

Source file name: area.c, area.cpp or area.java

You just met John, he wants to know what is the probability of take any equally-probable (x, y) in $[0, a] \times [0, b]$ such way that the area of the rectangle with corners $(0,0)$, $(x, 0)$, $(0, y)$, (x, y) is less than S

Input

The input consists of several test cases, each one in one line with three positive floating point numbers a , b and S .

Output

For each case print one line with the value the probability as a percentage rounded to six digits after the period.

Sample input

```
1 10 5 20
2 1 1 1
3 2 2 0
4
```

Sample output

```
1 76.651629%
2 100.000000%
3 0.000000%
4
```

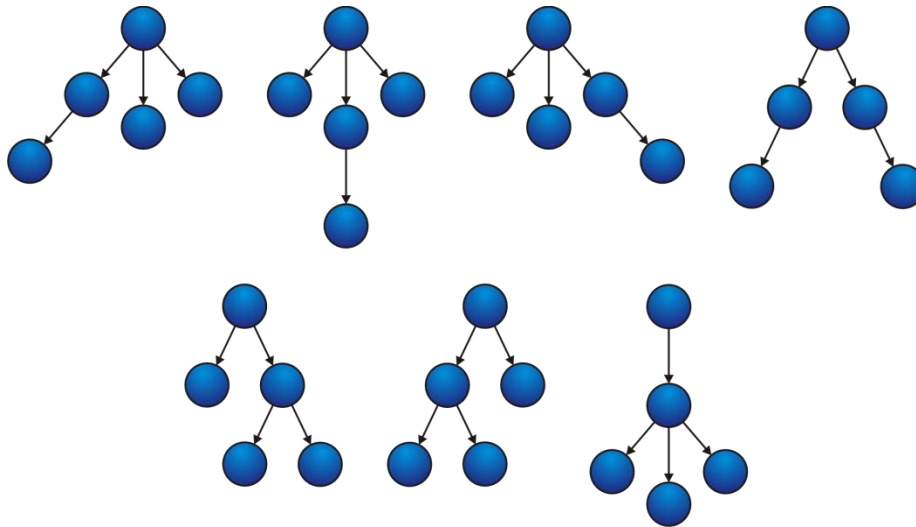


Problem B

Bring me a Tree

Source file name: *bring.c*, *bring.cpp* or *bring.java*

You are asked to tell how many trees of N nodes and height H can be made. For example, for $N = 5$ and $H = 2$ there are seven different trees:



Input

The first line of the input is the number of cases T , $T \leq 1000$. Then for each case there is one line with N and H where $1 \leq N, H \leq 200$.

Output

For each case print one line with the number of trees modulo 100000007.

Sample input

```
1 5
2 2 1
3 5 2
4 5 3
5 6 3
6 10 5
7
```

Sample output

```
1 1
2 7
3 5
4 18
5 1053
6
```



Problem C

Car Parking Tower

Source file name: cars.c, cars.cpp or cars.java

There is a new revolution in the parking lot business: the car parking tower. The concept is simple: you drive your car into the elevator at the entrance of the tower, and the elevator and conveyor belts drag the car to an empty parking spot, where the car remains until you pick it up. When you return, the elevator and conveyor belts move your car back to the entrance and you're done.

The layout of the tower is also simple. There is one central elevator that transports the cars between the different floors. On each floor there is one awesome circular conveyor belt on which the cars stand. This belt can move in clockwise and counterclockwise direction. When the elevator arrives on a floor, it becomes part of the belt so that cars can move through it.

At the end of the day the tower is usually packed with cars and a lot of people come to pick them up. Customers are processed in a first come first serve order: the elevator is moved to the floor of the first car, the conveyor belt moves the car on the elevator, the elevator is moved down again, and so on. We like to know how long it takes before the last customer gets his car. Moving the elevator one floor up or downwards takes 10 seconds and moving a conveyor belt one car in either direction takes 5 seconds.

Input

On the first line one positive number: the number of test cases, at most a hundred cases. After that per test case:

- One line with two integers h and l with $1 \leq h \leq 50$ and $2 \leq l \leq 50$: the height of the parking tower and the length of the conveyor belts.
- h lines with l integers: the initial placement of the cars. The j^{th} number on the i^{th} line describes the j^{th} position on the i^{th} floor. This number is -1 if the position is empty and r if the position is occupied by the r^{th} car to pick up. The positive numbers form a consecutive sequence from 1 to the number of cars. The entrance is on the first floor and the elevator (which is initially empty) is in the first position. There is at least one car in the parking tower.

Output

For each test case, the output should consist of a line indicating the number of seconds before the last customer is served.



Sample input

```
1 2
2 1 5
3 -1 2 1 -1 3
4 3 6
5 -1 5 6 -1 -1 3
6 -1 -1 7 -1 2 9
7 -1 10 4 1 8 -1
8
```

Sample output

```
1 25
2 320
3
```



Problem D

Dumb or Dumber

Source file name: *dumb.c*, *dumb.cpp* or *dumb.java*

The Cuban government assistance for critical moments is helping other countries like Venezuela to overcome the current economical crisis; their job is to calculate the cost/benefit balance of the other countries. They receive two numbers, indicating the total amount of benefits and costs, and they have to compute the final balance.

You have to solve the very complex business problem of computing balances. You are given two positive integer numbers, corresponding to the benefits and the costs. You have to obtain the total balance, i.e., the difference between benefits and costs.

Input

The first line of the input contains an integer indicating the number of test cases.

For each test case, there is a line with two positive integer numbers, B and C , corresponding to the benefits and the costs, respectively. Both numbers are between 0 and a huge (10^{100}) to the power of a hundred.

Output

For each test case, the output should consist of a line indicating the balance: $B - C$.

Sample input

```
1 4
2 10 3
3 4 9
4 0 8
5 5 2
6
```

Sample output

```
1 7
2 -5
3 -8
4 3
5
```