Greetings From Globussoft

- Given below are 5 Programming questions, you have to solve any 3 out of 5 questions.

- These 5 questions you can attempt in any technology like C/C++, java, .Net, PHP

- To solve these 3 questions you've max. 3 hours.

- While Solving these questions you are not allowed to use any Search Engine like Google, Yahoo, Bing ...

All the best for your test

Globussoft

QUESTION - 1

Vice City is built over a group of islands, with bridges connecting them. As anyone in Vice City knows, the biggest fear of vice-citiers is that some day the islands will submerge. The big problem with this is that once the islands submerge, some of the other islands could get disconnected. You have been hired by the mayor of Vice city to tell him how many islands, when submerged, will disconnect parts of Vice City. You should know that initially all the islands of the city are connected.

Input

The input will consist of a series of test cases. Each test case will start with the number N ($1 \leq N \leq 10^4$) of islands, and the number M of bridges ($1 \leq M \leq 10^5$). Following there will be M lines each describing a bridge. Each of these M lines will contain two integers Ui, Vi ($1 \leq Ui, Vi \leq N$), indicating that there is a bridge connecting islands Ui and Vi. The input ends with a case where N = M = 0.

Output

For each case on the input you must print a line indicating the number of islands that, when submerged, will disconnect parts of the city.

Example

Input:

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

Output:

```
0
1
```

QUESTION – 2

There are N ($1 \le N \le 4$) Foxen guarding a certain valuable treasure, which you'd love to get your hands on. The problem is, the Foxen certainly aren't about to allow that - at least, not while they're awake.

Fortunately, through careful observation, you've seen that each Fox has a regular sleep cycle. In particular, the ith Fox stays awake for A_i ($1 \le A_i \le 23$) hours, then sleeps for S_i ($1 \le S_i \le 23$) hours, repeating this pattern indefinitely ($2 \le A_i + S_i \le 24$). At the start of your treasure-nabbing attempt, the ith Fox is exactly O_i ($0 \le O_i < A_i + S_i$) hours into its cycle.

There are T ($1 \le T \le 20$) scenarios as described above. For each one, you'd like to determine how soon all of the Foxen will be simultaneously asleep, allowing you to grab their treasure, or if this will simply never happen.

Input

First line: 1 integer, T

For each scenario:

First line: 1 integer, N

Next N lines: 3 integers, A_i, S_i, and O_i, for $i = 1..N$

Output

For each scenario:

1 integer, the minimum number of hours after the start to wait until all of the Foxen are asleep during the same hour. If this will never happen, output the string "Foxen are too powerful" (without quotes) instead.

Example

```
Input:
2
2
2 1 2
2 2 1
3
1 1 0
1 1 0
1 1 1
```

```
Output:
6
Foxen are too powerful
```

QUESTION – 3

Alice and Bob are participating in an exciting new Olympic event, the Team Slide Treasure Hunt Race! This event takes place on a slide with various treasures on it, which is up to 10m wide and 10km long. Yes, that's kilometers.

The slide can be represented as a grid of cells, with N ($2 \le N \le 10^4$) rows and M ($2 \le M \le 10$) columns. The rows are numbered $1,2,\ldots,N$ from top to bottom, and the columns are numbered $1,2,\ldots,M$ from left to right. The cell in row i and column j is referred to as cell (i, j), and contains a treasure with value $G_{i,j}$ ($1 \le G_{i,j} \le 10^5$).

The two friends will each get to travel once down the slide, one after another. First, Alice will slide from the top-left corner of the slide (cell $(1, 1)$) down to the bottom-left corner (cell $(N, 1)$). Then, Bob will slide from the top-right corner (cell $(1, M)$) down to the bottom-right corner (cell (N, M)). Whenever a person moves in the slide, they move from their current row to the next row down, and they can also guide themselves left or right by one column if desired. This means that they can go from cell (i, j) to either cell $(i+1, j-1)$, $(i+1, j)$, or $(i+1, j+1)$, as long as they don't exit the slide. Throughout the race, both Alice and Bob collect the treasure in each cell they slide through - this includes their respective starting and ending cells. However, if Bob goes through any cell that Alice has already visited, he can't collect the treasure in it again.

Alice and Bob would like to determine a sliding plan to allow them to collect as much treasure as possible, and win the gold medal! They've asked you to determine the maximum total value of treasure that they can collect, out of all valid strategies.

Input

The first line of the input will contain two integers N and M, separated by a space. Each of the next N lines, for i from 1 to N, will contain the M space-separated integers $G_{i,1} G_{i,2} \ldots G_{i,M}$.

Output

Output one number on a line by itself: the maximum combined treasure value that Alice and Bob can collect.

Example

Input:
```
5 4
3 6 8 2
5 2 4 3
1 1 20 10
1 1 20 10
1 1 20 10
```

Output:
```
73
```

QUESTION – 4

Brian the Computer Science Nerd is going on a date with his girlfriend, Anatevka! His romantic location of choice is a Chinese restaurant.

At this restaurant, N ($1 \le N \le 15$) different dishes are available, and Brian would like to order each one exactly once. The waiter will come to his table to take orders N times - the ith time he comes will be W_i ($1 \le W_1 < W_2 < \cdots < W_N \le 10^9$) minutes after the start of the meal. He has quite a poor memory, so each time he comes by, Brian will have a chance to order exactly one new dish.

Dish i takes T_i ($1 \le T_i \le 10^9$) minutes to prepare, which means that it will generally come exactly that many minutes after being ordered, delivered by a different waiter who will not take orders. However, meals are guaranteed to arrive in the same order in which they were ordered - this means that, if meal i was ordered before meal j, but meal j is ready before meal i, then meal j will instead arrive at the same time as meal i.

Now, Brian considers time spent waiting for the first meal after the start of the dinner, as well as for each subsequent meal after the previous one, to be idle time. Of course, these are the worst parts of the date, as they require actually engaging in conversation rather than consuming sustenance. In order to impress Anatevka with his optimal ordering skills, he'd like to minimize the length of the largest continuous stretch of idle time throughout the dinner.

Input

Line 1: 1 integer, N

Line 2: N integers, $W_{1..N}$

Line 3: N integers, $T_{1..N}$

Output

1 integer, the minimal length possible for the longest stretch of idle time throughout the meal, in minutes

Example

```
Input:
3
1 5 6
4 2 3

Output:
4
```

QUESTION – 5

Everyone knows that our human ancestors relied on extraterrestrial beings to teach them about science and technology. After helping us build pyramids and chart the stars, our alien mentors decided we needed some time to grow in isolation, so they took some dolphins and left to colonise another planet. Just before leaving, though, they gave us instructions on how to contact them in case of an emergency, such as global warming, nuclear holocaust, or a shortage of fish. The intergalactic telephone they designed consisted of a large golden box powered by alien arc technology. It was entrusted to the United Anarchist Alliance, but was lost when they went to war with the Unified Anarchist League after unsuccessful negotiations to decide which name was more logical for anarchists to call themselves. It remained lost for several centuries at the bottom of a lake until renowned archaeologists Indiana Serkis and Meronym Spader discovered it by chance during a fishing trip. Upon opening the box and pressing the large red button they found inside, an ancient alien immediately appeared and asked them deep, probing questions to determine whether humanity had advanced to the point where the aliens could come back to Earth and chill with us. Among other things, the aliens asked Indiana what his favorite color was, and what the result would be if 38157917385 were divided by 53387519, expressed as quotient and remainder. Since mathematics was never Indiana's or Meronym's strong suit, they've asked you to write a program for them to perform such computations automatically. They have a computer with them that only understands one language, but they assure you that despite its simplicity the language is Turing complete and perfectly capable of computing the desired quantities efficiently.

Note: You can use any programming language you want, as long as it is brainf**k.

Input

The first line contains an integer **T** ($1 \le \mathbf{T} \le 1000$). Then follow **T** lines, each containing integers **x** ($0 \le \mathbf{x} \le 10^{20}$) and **y** ($1 \le \mathbf{y} \le 10^{20}$) separated by a single space. Each line, including the last, is terminated by a single newline (linefeed) character, which has ASCII value 10.

Output

T lines containing the quotient and remainder of **x** divided by **y**, separated by a space.

Example

Input:

```
5
0 42
42 42
123 45
12 345
10000 42
```

Output:

```
0 0
1 0
2 33
0 12
238 4
```