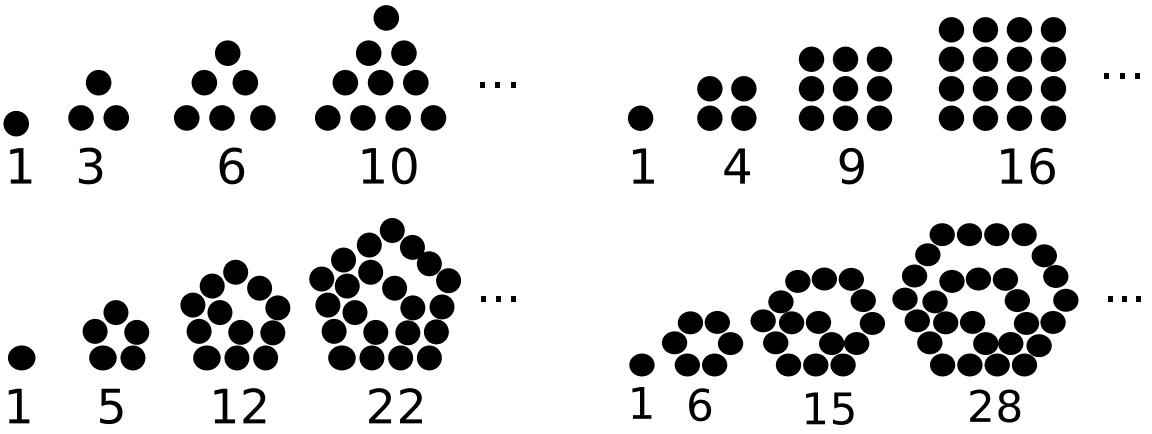
11 Figurate

Marge and Gunther are extraterrestrial archaeologists studying secret images sent back by the Mars rovers Spirit and Opportunity. They show markings like the following:

⬡⊙⊙⊙⊙⊙⊙▫⊙⊙⊙⬠⊙△⊙

It's a series of triangles, squares, pentagons, and hexagons, with each polygon followed by a number of ⊙s. To encode these markings in text files, Marge and Gunter write each collection of markings as numbers on a line. The preceding markings are recorded as 4 6 6 4 3 5 1 3 1. The first number describes the number of polygons in the marking. Each pair of numbers after that represent the number of sides in the polygon and the number of ⊙s that follow it.

Due to other evidence, they know that ancient Martians were fans of figurate numbers. These are numbers that can be found by counting the number of dots in regular polygons of various sizes. For example, the triangular, square, pentagonal and hexagonal numbers are found by counting the number of dots in each successively larger polygon.



Figurate numbers can also be calculated by summing a series. These are the formulas for the nth Triangluar, Square, Pentagonal, and Hexagonal numbers:

$T(n) = \sum_{i=1}^{n} i = 1 + 2 + 3 + ... + n$

$S(n) = \sum_{i=1}^{n} 2 * i - 1 = 1 + 3 + 5 + ... + 2 * n - 1$

$P(n) = \sum_{i=1}^{n} 3 * i - 2 = 1 + 4 + 7 + ... + 3 * n - 2$

$H(n) = \sum_{i=1}^{n} 4 * i - 3 = 1 + 5 + 9 + ... + 4 * n - 3$

Marge and Gunther interpret the Martian markings by treating each polygon followed by n ⊙s as the nth figurate number for the appropriate polygon. For example, ▫⊙⊙⊙ is interpreted as $S(3) = 1 + 3 + 5 = 9$, the 3rd square number.

Next, they add all numbers from a collection of markings. For example,
⬡⊙⊙⊙⊙⊙⊙▫⊙⊙⊙⬠⊙△⊙ is $H(6) + S(3) + P(1) + T(1) = 66 + 9 + 1 + 1 = 77$.

Finally, Marge and Gunter take consecutive runs of the numbers acquired by this process and treat them as ASCII values. They are amazed to find the resulting text reads as English

sentences.

Marge and Gunter want to interpret the large messages revealed in the images from Mars, but are tired of doing the calculations by hand. Help them by writing a program to decipher the ancient Martian messages. They had a bunch of students transcribe the markings into the format described here.

The first line of input consists of a number, $1 \leq K \leq 150,000$, which specifies the number of lines to follow. Each following line has the format of a number, $1 \leq M \leq 10$, followed by M pairs of numbers. Each of these pairs has a first number, P, and a second number, N. P describes the number of sides on the polygon, and N is the number in that sequence. These lines match the description given earlier in this document.

The program output must compute a single character from each of the K lines, using the process described above. These characters are concatenated into one string, then displayed verbatim, with a newline character following them.

In the first example below, note that last line indicates the third triangle number, 10. This is the ASCII code for the newline character. Thus, the output has the newline character described in the input, plus the following newline character.

Note: The ↵ symbol in the examples below represents a newline character.

Sample Input

```
15↵
4 6 6 4 3 5 1 3 1↵
2 4 9 4 4↵
4 6 7 4 4 6 2 6 1↵
6 6 7 3 6 6 1 5 1 5 1 6 1↵
4 6 7 3 4 3 2 3 1↵
2 4 10 3 4↵
3 4 5 3 3 4 1↵
2 3 11 5 2↵
2 3 13 6 2↵
4 5 8 4 4 5 2 3 1↵
5 6 7 6 2 4 1 3 1 5 1↵
3 6 7 3 5 4 2↵
5 5 8 3 3 4 1 3 1 6 1↵
5 3 14 6 2 6 1 3 1 3 1↵
1 3 4↵
```

Sample Output

```
Martin Gardner↵
↵
```

Bonus Sample Input

```
13↵
4 6 6 4 2 5 1 3 1↵
2 4 10 4 1↵
3 6 7 4 4 6 1↵
4 6 7 6 3 3 1 6 1↵
4 5 8 5 3 6 2 6 1↵
3 3 7 3 2 3 1↵
4 4 8 3 2 4 1 3 1↵
3 4 9 3 5 5 1↵
5 3 14 6 2 5 1 4 1 5 1↵
4 3 14 6 2 6 1 4 2↵
3 3 13 5 3 6 1↵
3 3 7 4 2 5 1↵
1 3 4↵
```

Bonus Sample Output

The output for this sample is not given, but should make sense when you find it.