Dates in text

Quido is analyzing reports of travel agents in his overseas travel company. The reports refer to various events in the previous year 2019. In the preprocessing phase, the dates of the events have to be extracted from the reports. Quido aims for an automated programmatical preprocesing. He has specified how a date in a text should be represented to be discernible by a relatively simple computer program.

A word is a sequence of characters which does not contain any spaces.

DM-date is an unempty sequence of digits followed by a period, followed by another sequence of digits and another period. The second digit sequence is interpreted as a number of month and the first digit sequence is interpreted as a number of the day in that month. The whole date defined by this two numbers must be a date in the year 2019. The examples of DM-dates are:

```
1.1.
31.1.
1.2.
28.2.
9.9.
10.10.
11.10.
20.12.
31.12.
```

Sentences in the text may contain month names.
Month name can also contain a single comma or single period at its end. Examples of month names therefore are:

```
May
June,
July.
```

Month name always starts with a capital letter therefore the following examples are not month names.

```
august
september,
october.
```

Sentences in the text may contain separate integers.
An integer is a sequence of digits and it can be terminated by a single comma or by a single period. Examples of integers therefore are:

```
23
24,
25.
```

A sentence S contains a date if one of the following conditions holds:

1. S contains one DM-date and it does not contain any month name.
2. S contains exactly one month name and at least one integer which may be interpreted as a day in that month.

The date is extracted from the sentence as follows:
In case 1. above, the date is the DM-date.
In case 2. above, the integer which is the closest one to the month name is interpreted as the day. I case there are two integers in the same minimum distance from the month name the first one of them is interpreted as the day.

The distance between two words, say A and B, in a sequence is equal to the number of words between A and B. The length of particular words is not relevant.

The task

You are given list of sentences. If any sentence in the list contains a date according to the rules given above, extract that date from the sentence.

Input

The first input line contains one integer N, the number of sentences in the input. Next, N lines follow, each line contains one sentence. Each sentence consists of words separated by spaces. Caracters in the input sentences are small and capital letters of english alphabet, ('abcd...xyz', 'ABCD...XYZ'), digits ('1234567890') comma and period. Each sentence is terminated by period. Each sentence contains at most 40 words, each word length is at most 65 characters.
It holds, 2 &le $N \leq 10^4$.

Output

For each sentence in the input, the output contains one line specifying the date in the corresponding sequence, if the sentence contain a date. The line starts with the sentence label followed by a period and a space. Next, the line contains the month name and the day number separated by space.
The sentence label is the integer specifying the order of the sentence in the input list. The ordering starts with 1.

Example 1

Input

```
14
That year winter weather lasted till early May.
Jill left in February, she spent 8 days in Berlin.
The newly planted trees were held up by wooden frames.
There were only seventeen players in the club in August.
She said it happened on 23.12. and others supported her view.
```

```
Tom, Pat and Sue had no time in November, however.
April and May were her favourite names and 27 was her favourite number.
In August it was possible to collect 23, 24, and 25 specimens, respectively.
They intended to arrive on 23.8. or on 27.8.
We could not find any documents in the 4th drawer.
Sand was blown on the beach on 1.1. in Perth.
Numbers 11, 12 or 14 may be brought in focus in April this year.
Another example is 5 and 10 of February.
And finally, check 1 2 3 in July against 5 6 7 in other months.
```

Output

```
2. February 8
5. December 23
8. August 23
11. January 1
12. April 14
13. February 10
14. July 3
```

The data of Example 1 are depicted in Image 1a).

Example 2

Input

```
8
31.7.
7.31.
December 1.
1 December.
2 December 3.
1 2 3 4 December 5 6 7 8.
33 34 35 December 37 38 40 31.
31 33 34 35 December 37 38 40 30.
```

Output

```
1. July 31
3. December 1
4. December 1
5. December 2
6. December 4
7. December 31
8. December 31
```

Example 3

Input

```
8
January February.
March 3 April.
March 3 4 April.
April 4 5 may.
32.32. 16.7. 31.31.
32.32. 18.7. July 18 31.31.
28.2. February 29.
29.2. February 28.
```

Output

```
4. April 4
5. July 16
8. February 28
```

Public data

The public data set is intended for easier debugging and approximate program correctness checking. The public data set is stored also in the upload system and each time a student submits a solution it is run on the public dataset and the program output to stdout and stderr is available to him/her.
Link to public data set