

American Computer Science League

2021 Finals • Sentences • Junior & Intermediate Divisions

PROBLEM: Given a dictionary of words and a sentence structure, you will generate sentence(s) of that structure using words from the dictionary.

The dictionary of words is a set of strings. Each string starts with a capital letter indicating a part of speech, followed by a list of words. The parts of speech are noun (N), command (C), verb (V), adjective (J), adverb (B), and preposition (P). Each word consists of lowercase letters only and words will be separated by a single space.

Since there are only 3 articles in the English language (“a”, “an” and “the”), we will not include this in the dictionary, but we will use an (A) for either of the words “a” or “an” and a (T) for the word “the”. The word “an” is used if the next word begins with a vowel (a, e, i, o, u) and the word “a” is used otherwise.

The types of sentences are:

- Declarative (D) sentences are used to state information. Declarative sentences end with a period.
- Imperative (I) sentences give commands. Imperative sentences end with a period.
- Interrogative (Q) sentences ask questions. Accordingly, they end with a question mark. They will always begin with the word “What”.
- Exclamatory (E) sentences express emotion and end with an exclamation mark.

The sentence structures are strings of capital letters identifying the type of sentence described above followed by the part of speech code for each word in each sentence. When using the words in the dictionary, wrap around to use the first word again for that part of speech when the list of words is exhausted. Multiple sentences can be generated by separating each of them with a single space. All sentences that are generated must start with a capital letter.

For example, assume you are given the following input:

```
6
B productively
J green
N apple tree birds
C pick
V grows fly
P on above below among
ETJNVBPTN QNVP DTJNVPAJNPN ICAN
```

This would produce the following output:

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The green apple grows productively on the tree! What birds fly above? The green apple grows below a green tree among birds. Pick an apple.

INPUT:

For each set of input data, the first input line will include the number of parts of speech in the dictionary. This will be followed by that many lines of strings, each of which will start with a capital letter followed by the words in all lowercase letters that can be used for that part of speech. The last line of data will be a string representing the sentence structure of the output. For each sentence to be produced, the letters E, I, Q, and D will be followed by the possible letters N, C, V, J, B, or P along with the letters A or T. There will be no more than 10 sentences. All data values on each line will be separated by a single space.

OUTPUT: The sentence(s) of the type(s) described above using the words in the dictionary provided and the sentence structure(s) on the last input line.

SAMPLE INPUT (separated by a blank line for readability):

3
N money tree sky
C grow fall
P on from
ICNPTN ICPTN

4
J ageless
N money tree
P on from
V grows falls
QNVPAJN

6
N money tree
B quickly
C take collect
V grows falls runs
J indigenous free
P on from
QNVPAN DNVPAJN ECTNPTNB ICTJNB

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SAMPLE OUTPUT:

Grow money on the tree. Fall from the sky.

What money grows on an ageless tree?

What money grows on a tree? Money falls from an indigenous tree. Take the money on the tree quickly! Collect the free money quickly.

(the two lines above are split for readability; there is no line break in the output)

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TEST DATA

TEST INPUT (separated by a blank line for readability:

5

N dog skateboard oriole
J small brown orange big
V struck saw took
P on
B suddenly restlessly
ETJJNPTNVTJNB

5

V saw bit took
J small orange
B very restlessly
N dog fish oriole waves
C help
DTJNVTJNBB ICTN

3

N dog fish bird waves
C stop help fix
J angry small orange
ICTJN ICTJN ICTJN

6

J big small
B suddenly tirelessly
N seed orange oriole desk
C stop code help fix
V fed saw bit
P in on to at of
QJNPTNVTJN ICB ECBPTJN

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5

N apples trees birds clouds frogs

B freely happily very

J tall green

V grow fly

P on below upon above over

DNVPJJN QNVBPTN DNVB EVPN QNVBJ DNVBPJN

6

C jump catch

V struck saw sunk took

N dog fish oriole waves

J green small big orange

B nearly suddenly restlessly

P over above

EAJNBVAJNB QBVAN DTNBVTJN ECBPTN ICANBPTN

6

N dog fish oriole wave

C help catch ride

V caught saw bit took

J green small big orange

B suddenly slowly

P through on over

DANVAJN EANVAJN QVTNB ICTNCAJJN ECBPTJNPAN

6

N dog fish worm oriole

C stop code help fix

V bit saw

B suddenly restlessly

P on over through

J orange small big

ICAN QNVAJN DAJNVAJN DANVPAJN

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6

V told

J big orange small

B suddenly restlessly

C code stop help fix

P on from about

N message man airplane

ICAN EC ICANPTJJN DANPTNVPAN

3

V stops

B quickly freely abruptly

C stop

ICB QV ECB IC QVB EC IC QV ECB IC

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TEST OUTPUT:

The small brown dog on the skateboard struck the orange oriole suddenly!

The small dog saw the orange fish very restlessly. Help the oriole.

Stop the angry dog. Help the small orange fish. Fix the angry bird.

What big seed in the orange fed the small oriole? Stop suddenly. Code tirelessly on the big desk!

Apples grow on tall green trees. What birds fly freely below the clouds? Frogs grow happily. Fly upon apples! What trees grow very tall? Birds fly freely above green clouds.

A green dog nearly struck a small fish suddenly! What restlessly saw an oriole? The waves nearly sunk the big dog. Jump suddenly over the fish! Catch an oriole restlessly above the waves.

A dog caught a green fish. An oriole saw a small wave! What bit the dog suddenly? Help the fish catch a big orange oriole. Ride slowly through the green wave on a dog!

Stop a dog. What fish bit an orange worm? A small oriole saw a big dog. A fish bit on an orange worm.

Code a message. Stop! Help a man on the big orange airplane. A message from the man told about an airplane.

Stop quickly. What stops? Stop freely! Stop. What stops abruptly? Stop! Stop. What stops? Stop quickly! Stop.

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题目：给出一部词典和一个句子结构，你需要用词典中的单词生成符合该结构的句子。

词典中的单词是一组字符串。每组字符串以一个大大写字母开头，表示单词的词性，后面是一串单词。词性包括名词(N)、命令 (动词) (C)、 动词(V)、 形容词(J)、 副词 (B) 和介词(P)，后面的每个单词均为小写字母，且单词之间用空格隔开。

由于英语中只有 3 个冠词 (“a”, “an” 和 “the”)，因此我们不会把这一词性包含在词典中。但是会使用 (A) 来表示单词 “a” 和 “an”，以及 (T) 来表示单词 “the”。如果后边的单词以元音 (a, e, i, o, u) 开头，则用 “an”，否则用 “a”。

句子类型包括：

- 陈述句 (D) 用来说明信息。陈述句以句号结尾。
- 祈使句 (I) 用来表达指令。祈使句以句号结尾。
- 疑问句 (Q) 用来提出问题。因此，疑问句以问号结尾。疑问句通常以 “What” 开头。
- 感叹句 (E) 用来表达情感，以感叹号结尾。

句子结构是由大写字母组成的字符串，用来判断以上描述的句子类型，后面表示每个句子中每个单词的词性编码。使用词典中的单词时，当词典中某一词性的单词都用完后，需要返回再次使用该词性下的第一个单词。

如果生成多个句子，句子之间要用空格分隔开。所有生成的句子需要以大大写字母开头。

假如给定以下输入：

```
6
B productively
J green
N apple tree birds
C pick
V grows fly
P on above below among
ETJNVBPTN QNVP DTJNVPAJNPN ICAN
```

则会输出：

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The green apple grows productively on the tree! What birds fly above? The green apple grows below a green tree among birds. Pick an apple.

输入:

对于每组输入数据，第一行表示词典中词性的数量。后面是多行字符串，每行都以大写字母开头，后接该词性下可以使用的小写单词。最后一行是字符串，表示输出句子的结构。对于每个句子，字母 E, I, Q 和 D 后可能接字母 N, C, V, J, B 或 P 以及字母 A 或 T。句子数量不会超过 10。每行上的所有数据值用空格分隔。

输出：用所给词典中的单词和最后一行输入的句子结构输出如上所述的句子/句群类型。

样本输入 (为了便于阅读，用空行隔开):

3

N money tree sky

C grow fall

P on from

ICNPTN ICPTN

4

J ageless

N money tree

P on from

V grows falls

QNVPAJN

6

N money tree

B quickly

C take collect

V grows falls runs

J indigenous free

P on from

QNVPAJN DNVPAJN ECTNPTNB ICTJNB

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样本输出:

Grow money on the tree. Fall from the sky.

What money grows on an ageless tree?

What money grows on a tree? Money falls from an indigenous tree. Take the money on the tree quickly! Collect the free money quickly.

(以上两行为了可读性而分开，输出中没有换行符)

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测试数据

测试输入 (为了便于阅读, 用空行隔开):

5

N dog skateboard oriole
J small brown orange big
V struck saw took
P on
B suddenly restlessly
ETJJNPTNVTJNB

5

V saw bit took
J small orange
B very restlessly
N dog fish oriole waves
C help
DTJNVTJNBB ICTN

3

N dog fish bird waves
C stop help fix
J angry small orange
ICTJN ICTJJN ICTJN

6

J big small
B suddenly tirelessly
N seed orange oriole desk
C stop code help fix
V fed saw bit
P in on to at of
QJNPTNVTJN ICB ECBPTJN

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5

N apples trees birds clouds frogs

B freely happily very

J tall green

V grow fly

P on below upon above over

DNVPJJN QNVBPTN DNVB EVPN QNVBJ DNVBPJN

6

C jump catch

V struck saw sunk took

N dog fish oriole waves

J green small big orange

B nearly suddenly restlessly

P over above

EAJNBVAJNB QBVAN DTNBVTJN ECBPTN ICANBPTN

6

N dog fish oriole wave

C help catch ride

V caught saw bit took

J green small big orange

B suddenly slowly

P through on over

DANVAJN EANVAJN QVTNB ICTNCAJJN ECBPTJNPAN

6

N dog fish worm oriole

C stop code help fix

V bit saw

B suddenly restlessly

P on over through

J orange small big

ICAN QNVAJN DAJNVAJN DANVPAJN

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6

V told

J big orange small

B suddenly restlessly

C code stop help fix

P on from about

N message man airplane

ICAN EC ICANPTJJN DANPTNVPAN

3

V stops

B quickly freely abruptly

C stop

ICB QV ECB IC QVB EC IC QV ECB IC

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测试输出:

The small brown dog on the skateboard struck the orange oriole suddenly!

The small dog saw the orange fish very restlessly. Help the oriole.

Stop the angry dog. Help the small orange fish. Fix the angry bird.

What big seed in the orange fed the small oriole? Stop suddenly. Code tirelessly on the big desk!

Apples grow on tall green trees. What birds fly freely below the clouds? Frogs grow happily. Fly upon apples! What trees grow very tall? Birds fly freely above green clouds.

A green dog nearly struck a small fish suddenly! What restlessly saw an oriole? The waves nearly sunk the big dog. Jump suddenly over the fish! Catch an oriole restlessly above the waves.

A dog caught a green fish. An oriole saw a small wave! What bit the dog suddenly? Help the fish catch a big orange oriole. Ride slowly through the green wave on a dog!

Stop a dog. What fish bit an orange worm? A small oriole saw a big dog. A fish bit on an orange worm.

Code a message. Stop! Help a man on the big orange airplane. A message from the man told about an airplane.

Stop quickly. What stops? Stop freely! Stop. What stops abruptly? Stop! Stop. What stops? Stop quickly! Stop.