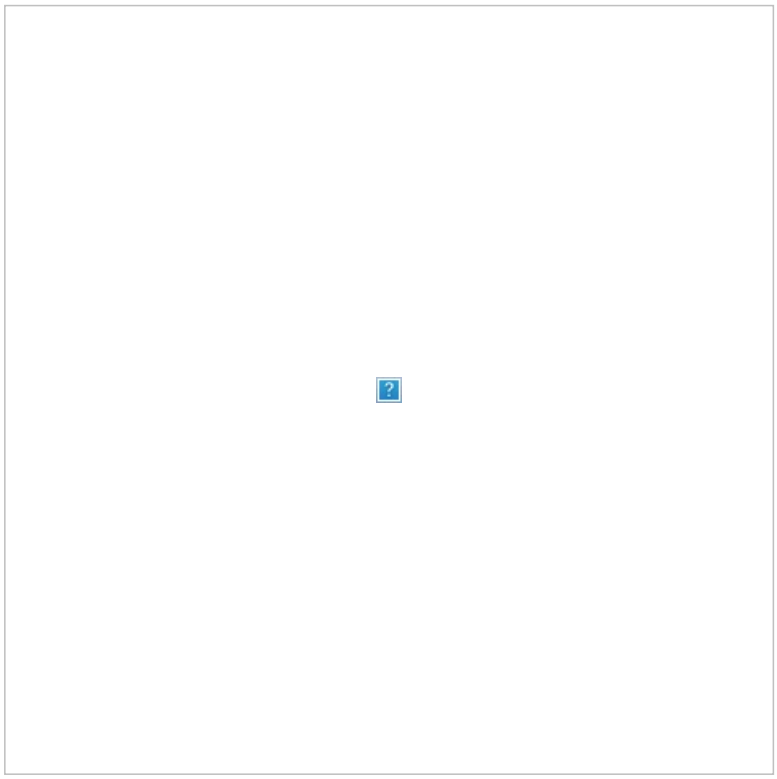
[PI016] - Morse Code

Task



The year is 2125. Earth has long established communication relays on distant planets and moons. One of those outposts — Station Zeta on Europa — has just sent a distress transmission back to Earth.

But the signal is encoded in binary Morse code — the old-fashioned method of communication from the early 20th century — a failsafe system used only in extreme emergencies when all modern channels are offline.

It's your job as part of the Earth Command decoding team to write a program that will decode this cryptic stream of binary characters into readable text.

The message comes in as a long string of 0s and 1s.

- **1**s indicate that a pulse was sent.
- **0**s indicate silence (no pulse being sent).

All messages are composed of uppercase alphabetical letters (A to Z) and numerical characters (0 to 9). All words are separated by just one space. The message starts and ends with a non-whitespace character.

The image illustrates the encoding. For example, the letter 'A' is encoded as "dot space dash" and it corresponds to 5 (1+1+3) units which in binary is "10111".

Input

Input consists of one line with characters '0' and '1'.

Ouput

You have to print the encoded message. The encoded message will have at least 1 and at most 50 characters.

Example 1

Input

```
101110001110
101010001110
101110100011
101010001000
101011101000
111011101000
101010100010
100010111011
101110001110
101110001011
101010001110
111000111010
001110111011
100010111011
101000111011
101011100010
111010001010
100011100010
101110001010
101110001011
101110001110
101011100011
101011101110
```

```
001110111010
100011101110
111011101110
001011101110
111011100010
101110111011
100010101011
101110001010
101011100010
101010100011
101010101000
111011101010
100011101110
111010100011
101110111011
101
```

Output

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789
```

Note: This output example includes of all the characters that are used.

Example 2

Input

```
10101010001000101110101000101110101000111011101110000000010111011100011101110111000101110100010111010100011110101
```

Output

```
HELLO WORLD
```
