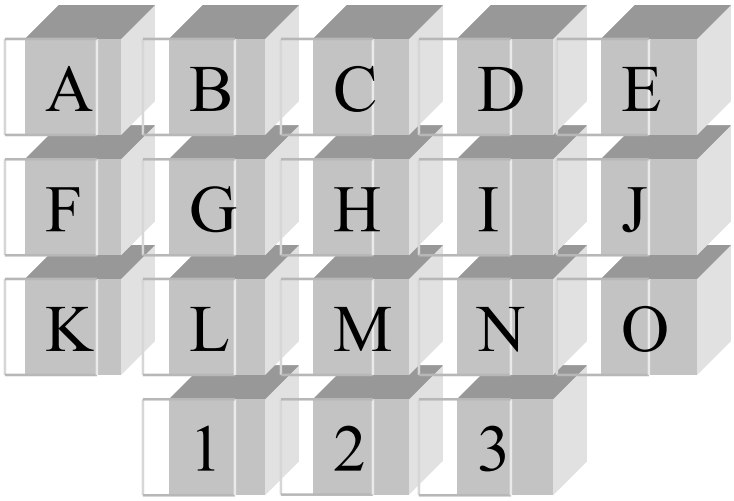
Knight Sequences

Pictured below is a keypad:



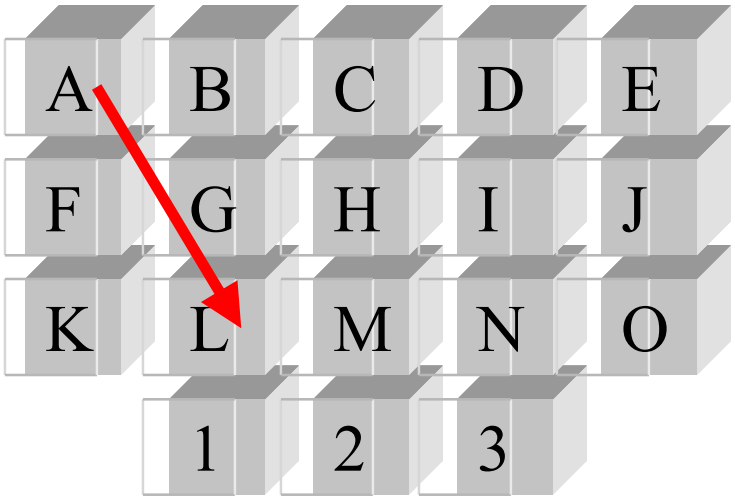
We want to find all 10-key sequences that can be keyed into the keypad in the following manner:

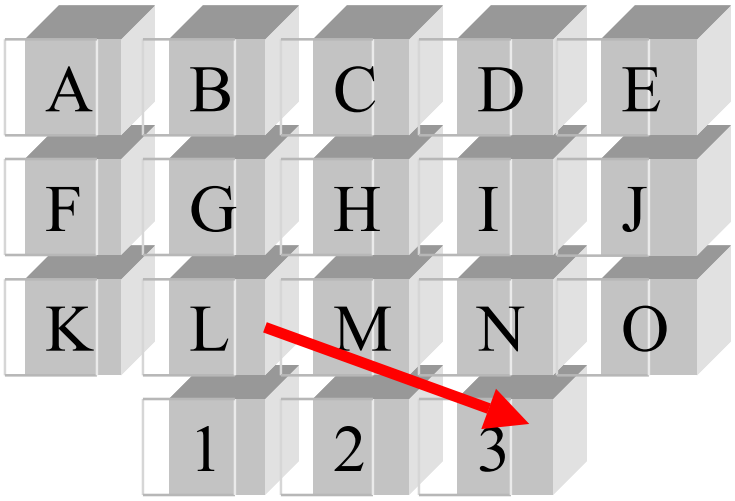
- The initial keypress can be any of the keys.
- Each subsequent keypress must be a *knight move* from the previous keypress.
- There can be at most 2 vowels in the sequence.
- We will attempt to run your solution at lengths of 10, 16 and 32.

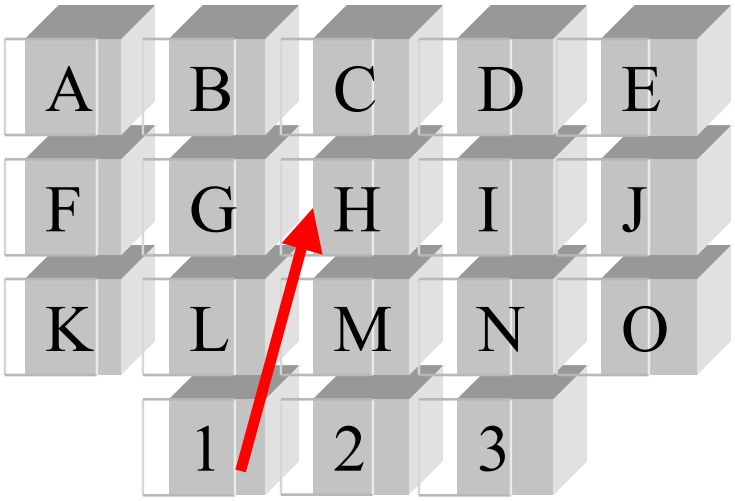
A knight move is made in one of the following ways:

1. Move two steps horizontally and one step vertically.
2. Move two steps vertically and one step horizontally.

There is no wrapping allowed on a knight move.
Below are some examples of knight moves:


A B C D E
F G H I J
K L M N O
1 2 3


A B C D E
F G H I J
K L M N O
1 2 3


A B C D E
F G H I J
K L M N O
1 2 3

Your program should first write the number of valid 10-key sequences on a single line to standard out.