

P0P0 The Decryption Droid

While debugging your broken Decryption Droid, *P0P0*, you find that his programming contains a function for creating a sequence of random-looking 2-digit numbers, starting only with an initial secret number.

To find the next number in a sequence, P0P0's random sequence function:

1. Squares the current 2-digit number.
2. Adds zeroes to the front of this number to ensure the result is exactly 4 digits long.
3. Returns the middle two digits of the result as the next value in the sequence.

You guess that this random sequence function can be called repeatedly, always providing the previous number.

Sadly, P0P0 is badly broken (due to a bad motivator) so you cannot use him to decode the message that you have just received from the rebel alliance. This is urgent, so you will need to work out how to decode the message yourself!

The message data contains only the following information:

	0	1	2	3	4	5	6	7	8	9
00	Y	H	O	U	O	E	C	A	A	H
10	U	Y	Z	Y	Y	B	U	W	E	F
20	U	N	A	P	O	Y	X	L	E	P
30	T	L	M	C	F	T	L	W	J	Z
40	S	H	M	X	X	G	R	A	V	J
50	U	A	M	D	J	B	V	C	K	V
60	T	D	S	K	A	S	Y	A	Y	D
70	J	K	B	T	H	K	M	O	N	S
80	T	Y	P	E	Y	T	G	Y	X	A
90	M	U	M	S	U	C	N	S	S	A

Hidden in P0P0's memory you find that today's initial secret number is **94**.

What is the hidden word?

Difficult, for bonus marks:

- What is the longest word that P0P0's encryption scheme can transmit?
- Can you think of better ways to create longer sequences of random looking numbers?