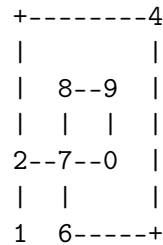


4A – Labyrinth

Fred is a robotic mouse built by a group of students of artificial intelligence. Fred can move around in the labyrinth shown in the picture below. Whenever Fred comes to a place marked by a number, he has to choose one of the possible directions. Behavior of the mouse should look chaotic and complex enough so that it will impress students' supervisor.



Numbered places in the labyrinth are called nodes. Fred has one integer X stored in its memory and can perform some calculations. In each node (except node 1) he chooses a direction according to X , decreases X by 1 and goes to the chosen node. The direction is chosen according to this rules:

- Node 2:** Compute $X \bmod 3$. If the result is 0, go to 7; if is 1, go to 1; and if is 2, go to 4.
- Node 4:** Let Y be X written backwards (in decimal system). If $Y > X$ then go to 6 otherwise go to 2.
- Node 6:** Compute the number of digits of X (in decimal system). If the result is even then go to 4 otherwise go to 7.
- Node 7:** Compute $(X \cdot X) \bmod 7$. If the result is 0 go to 2; if is 1 go to 6; if is 2 go to 8; and if is 4 go to 0.
- Node 8:** Compute $X \bmod 5$. If the result is 2 or 3 then go to 7 otherwise go to 9.
- Node 9:** If you have come from 8 then go to 0. If you have come from 0 then go to 8.
- Node 0:** Let Y be the third least significant digit of X in decimal system (if $X < 100$ then $Y = 0$). If $Y \leq 7$ then go to 7 otherwise go to 9.

At the beginning of each experiment, the experimenter puts the mouse in the node 0 and initializes value X by voice. After that, the mouse starts to move. The mouse displays current value of X on its digital display. The experiment finishes when the mouse enters the node 1, the result of the experiment is the number displayed. If the value of X decreases to zero, the experiment fails and its result is -1 .

Input

The input contains several initial values of X as they were told by the experimenter.

Output

For each value of X in the input write to a separate line of the output the result of the corresponding experiment (see example output).

Example

Input:	Output:
thirteen	-1
fourteen	9
one-thousand	789