7 Devlali

Milo and Geoffrey are traveling through small towns in India. In Devlali, they find information about the mathematical concept of "generated numbers" and "self numbers".

To understand this idea take a number, such as 54. Add its digits to its value, $5+4+54 = 63$. Since 63 can be generated by this process, it is a generated number. However, 31 is a self number, because there is no number that can generate it with this process. Other numbers can be generated by more than one number. For example, $1 + 0 + 0 + 100 = 101$ and $9 + 1 + 91 = 101$. So, 101 is called a junction number.

Milo and Geoffrey want to apply this concept to large set of numbers, classifying each of them as self, junction, or generated numbers. Help them, by writing a program to determine the type of a number.

The first line of the input will have a single integer, $1 \leq N \leq 1000$, the number of lines that follow. For each following line, there will be one number, $1 \leq M \leq 10000$.

The output will consist of one line per input number M. The line will be M followed be a single space, followed by "self", "junction", or "generated". The word depends on the classification of M.

Note: The ↵ symbol in the examples below represents a newline character.

Sample Input

```
6↵
63↵
31↵
101↵
9934↵
9993↵
9994↵
```

Sample Output

```
63 generated↵
31 self↵
101 junction↵
9934 junction↵
9993 self↵
9994 generated↵
```