# Problem B. Binary vs Decimal

Input file: `binary.in`
Output file: `binary.out`

Bruce has recently got a job at NEERC (Numeric Expression Engineering & Research Center) facility, which studies and produces many kinds of curious numbers. His first assignment is to perform a study of bindecimal numbers.

A positive integer is called *bindecimal* if its decimal representation is a suffix of its binary representation; both binary and decimal representations are considered without leading zeros. For example, $10_{10} = 10\mathbf{10}_2$, thus, 10 is a bindecimal number. The numbers $1010_{10} = 111111\mathbf{0010}_2$ and $42_{10} = 1010\mathbf{10}_{10}$ are, evidently, not bindecimal.

First of all, Bruce is going to create a list of bindecimal numbers. Help him find the $n$-th smallest bindecimal number.

## Input

The first and the only line contains one integer — $n$ ($1 \le n \le 10\,000$).

## Output

Print one integer — the $n$-th smallest bindecimal number in decimal notation.

## Sample input and output

| binary.in | binary.out |
|---|---|
| 1 | 1 |
| 2 | 10 |
| 10 | 1100 |

## Note

Here is a table with the first few numbers which contain only 0's and 1's in their decimal representation (it is clear that all other numbers are not bindecimal):

| Decimal | Binary | Comment |
|---|---|---|
| 1 | **1** | 1st bindecimal number |
| 10 | 10**10** | 2nd bindecimal number |
| 11 | 10**11** | 3rd bindecimal number |
| 100 | 1100**100** | 4th bindecimal number |
| 101 | 1100**101** | 5th bindecimal number |
| 110 | 1101**110** | 6th bindecimal number |
| 111 | 1101**111** | 7th bindecimal number |
| 1000 | 111110**1000** | 8th bindecimal number |
| 1001 | 111110**1001** | 9th bindecimal number |
| 1010 | 111111**0010** | Not a bindecimal number |
| 1011 | 111111**0011** | Not a bindecimal number |
| 1100 | 1000100**1100** | 10th bindecimal number |