A. Lucky Ticket

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

*Petya loves lucky numbers very much. Everybody knows that lucky numbers are positive integers whose decimal record contains only the lucky digits **4** and **7**. For example, numbers **47**, **744**, **4** are lucky and **5**, **17**, **467** are not.*

Petya loves tickets very much. As we know, each ticket has a number that is a positive integer. Its length equals n (n is always even). Petya calls a ticket lucky if the ticket's number is a lucky number and the sum of digits in the first half (the sum of the first $n / 2$ digits) equals the sum of digits in the second half (the sum of the last $n / 2$ digits). Check if the given ticket is lucky.

Input

The first line contains an even integer n $(2 \le n \le 50)$ — the length of the ticket number that needs to be checked. The second line contains an integer whose length equals exactly n — the ticket number. The number may contain leading zeros.

Output

On the first line print "YES" if the given ticket number is lucky. Otherwise, print "NO" (without the quotes).

Sample test(s)

input
```
2
47
```
output
```
NO
```

input
```
4
4738
```
output
```
NO
```

input
```
4
4774
```
output
```
YES
```

Note

In the first sample the sum of digits in the first half does not equal the sum of digits in the second half ($4 \ne 7$).

In the second sample the ticket number is not the lucky number.

B. Lucky Mask

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

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Petya calls a *mask* of a positive integer n the number that is obtained after successive writing of all lucky digits of number n from the left to the right. For example, the mask of number 72174994 is number 7744, the mask of 7 is 7, the mask of 9999047 is 47. Obviously, mask of any number is always a lucky number.

Petya has two numbers — an arbitrary integer a and a lucky number b. Help him find the minimum number c $(c > a)$ such that the mask of number c equals b.

Input

The only line contains two integers a and b $(1 \le a, b \le 10^5)$. It is guaranteed that number b is lucky.

Output

In the only line print a single number — the number c that is sought by Petya.

Sample test(s)

input

```
1 7
```

output

```
7
```

input

```
100 47
```

output

```
147
```

C. Lucky Conversion

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

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Petya has two strings a and b of the same length n. The strings consist only of lucky digits. Petya can perform *operations* of two types:

- replace any one digit from string a by its opposite (i.e., replace 4 by 7 and 7 by 4);
- swap any pair of digits in string a.

Petya is interested in the minimum number of operations that are needed to make string a equal to string b. Help him with the task.

Input

The first and the second line contains strings a and b, correspondingly. Strings a and b have equal lengths and contain only lucky digits. The strings are not empty, their length does not exceed 10^5.

Output

Print on the single line the single number — the minimum number of operations needed to convert string a into string b.

Sample test(s)

input

```
47
74
```

output

```
1
```

input

```
774
744
```

output

```
1
```

input

```
777
444
```

output

```
3
```

Note

In the first sample it is enough simply to swap the first and the second digit.

In the second sample we should replace the second digit with its opposite.

In the third number we should replace all three digits with their opposites.

D. Lucky Number 2

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

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Petya loves long lucky numbers very much. He is interested in the **minimum** lucky number d that meets some condition. Let $cnt(x)$ be the number of occurrences of number x in number d as a substring. For example, if $d = 747747$, then $cnt(4) = 2$, $cnt(7) = 4$, $cnt(47) = 2$, $cnt(74) = 2$. Petya wants the following condition to fulfil simultaneously: $cnt(4) = a_1$, $cnt(7) = a_2$, $cnt(47) = a_3$, $cnt(74) = a_4$. Petya is not interested in the occurrences of other numbers. Help him cope with this task.

Input

The single line contains four integers a_1, a_2, a_3 and a_4 $(1 \le a_1, a_2, a_3, a_4 \le 10^6)$.

Output

On the single line print without leading zeroes the answer to the problem — the minimum lucky number d such, that $cnt(4) = a_1$, $cnt(7) = a_2$, $cnt(47) = a_3$, $cnt(74) = a_4$. If such number does not exist, print the single number "-1" (without the quotes).

Sample test(s)

input

```
2 2 1 1
```

output

```
4774
```

input

```
4 7 3 1
```

output

```
-1
```

E. Lucky Subsequence

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

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Petya has sequence a consisting of n integers.

The subsequence of the sequence a is such subsequence that can be obtained from a by removing zero or more of its elements.

Two sequences are considered different if index sets of numbers included in them are different. That is, the values of the elements do not matter in the comparison of subsequences. In particular, any sequence of length n has exactly 2^n different subsequences (including an empty subsequence).

A subsequence is considered lucky if it has a length exactly k and does not contain two identical lucky numbers (unlucky numbers can be repeated any number of times).

Help Petya find the number of different lucky subsequences of the sequence a. As Petya's parents don't let him play with large numbers, you should print the result modulo prime number 1000000007 $(10^9 + 7)$.

Input

The first line contains two integers n and k $(1 \le k \le n \le 10^5)$. The next line contains n integers a_i $(1 \le a_i \le 10^9)$ — the sequence a.

Output

On the single line print the single number — the answer to the problem modulo prime number 1000000007 $(10^9 + 7)$.

Sample test(s)

input

```
3 2
10 10 10
```

output

```
3
```

input

```
4 2
4 4 7 7
```

output

```
4
```

Note

In the first sample all 3 subsequences of the needed length are considered lucky.

In the second sample there are 4 lucky subsequences. For them the sets of indexes equal (the indexation starts from 1): $\{1, 3\}$, $\{1, 4\}$, $\{2, 3\}$ and $\{2, 4\}$.