# 3608 - Period

**Asia - Seoul - 2006/2007**

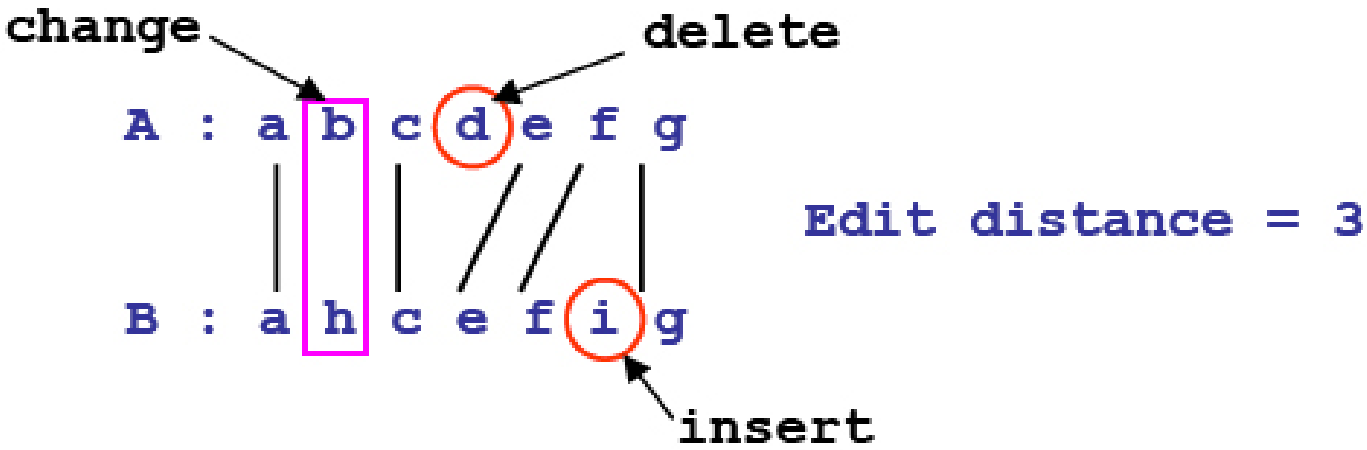
Given two strings $A$ and $B$ over an alphabet $\Sigma$, the edit distance between $A$ and $B$ is the minimum number of edit operations needed to convert $A$ into $B$. The three edit operations are the following:

(i) change: replace one character of $A$ by another single character of $B$.

(ii) deletion: delete one character from $A$.

(iii) insertion: insert one character of $B$ into $A$.

For example, the following figure shows that the edit distance between the strings $A$ =`abcdefg` and $B$ =`ahcefig` is 3. The edit operations are a change (i.e., replacing `b` of $A$ by `h` of $B$), a deletion (i.e., deleting `d` from $A$), and an insertion (i.e., inserting `i` of $B$ into $A$).




We now define a period of a repetitive string as follows: The string $p$ is called the exact period of a string $x$ if $x$ can be written as $x = p^k$, where $k \geq 1$ and $p$ is the shortest string. For example, if $x$ =`abababab` then $x$ = (`abababab`)$^1$ = (`abab`)$^2$ = (`ab`)$^4$. Thus, the string `ab` is the exact period of $x$. We define an approximate period similarly. Given two strings $x$ and $y$, suppose that the string $x$ is partitioned into substrings $p_i$, $1 \leq i \leq t$, where $p_i$ is not a null string, i.e., $x = p_1 \cdot p_2 \cdot p_3 \cdots p_t$. If the edit distance between a string $y$ and each substring $p_i$ is less than or equal to an integer $k$, string $y$ is called a $k$-approximate period of string $x$. In this problem, given two strings $x$ and $y$, we want to find the minimum $k$ such that string $y$ is a $k$-approximate period of string $x$. For example, suppose that two strings $x$ = `abcdabcabb` and $y$ =`abc` are given. Since $x$ may be partitioned into $x = p_1 \cdot p_2 \cdot p_3$ = abcd · abc · abb and the edit distances between string $y$ =`abc` and each substring `abcd`, `abc`, and `abb` equal to 1, 0, and 1, respectively, $y$ is a 1-approximate period of $x$. Hence, the minimum $k$ is one.

## Input

Your program is to read from standard input. The input consists of $T$ test cases. The number of test cases $T$ is given in the first line of the input. For each test case, a string $y$ is given in the first line and the string $x$ is given

in the next line. The length of string $y$ is at least 1 and at most 50, the length of string $x$ is at least 1 and at most 5000, and the alphabet $\Sigma$ is the set of lowercase English characters.

## Output

Your program is to write to standard output. Print exactly one line for each test case. Print the minimum integer value $k$ such that string $y$ is a $k$ -approximate period of string $x$ . The following shows sample input and output for three test cases.

## Sample Input

```
3
abc
abcdabcabb
abab
abababababab
xyz
abcdefghikjlmn
```

## Sample Output

```
1
0
3
```

---

Seoul 2006-2007