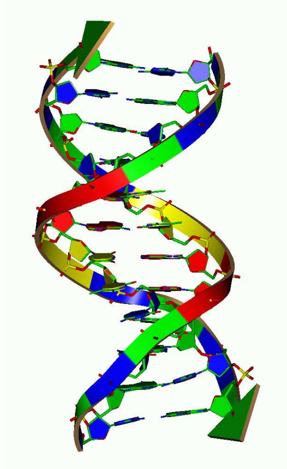
Problem D

Copying DNA



Evolution is a seemingly random process which works in a way which resembles certain approaches we use to get approximate solutions to hard combinatorial problems. You are now to do something completely different.

Given a DNA string S from the alphabet {`A`,`C`,`G`,`T`}, find the minimal number of copy operations needed to create another string T. You may reverse the strings you copy, and copy both from S and the pieces of your partial T. You may put these pieces together at any time. You may only copy contiguous parts of your partial T, and all copied strings must be used in your final T. Example: From S = "`ACTG`" create T = "`GTACTATTATA`"

1. Get `GT.........` by copying and reversing "`TG`" from S.
2. Get `GTAC.......` by copying "`AC`" from S.
3. Get `GTAC...TA..` by copying "`TA`" from the partial T.
4. Get `GTAC...TAAT` by copying and reversing "`TA`" from the partial T.
5. Get `GTACAATTAAT` by copying "`AAT`" from the partial T.

Input specifications

The first line of input gives a single integer, $1 \leq t \leq 100$, the number of test cases. Then follow, for each test case, a line with the string S of length $1 \leq m \leq 18$, and a line with the string T of length $1 \leq n \leq 18$.

Output specifications

Output for each test case the number of copy operations needed to create T from S, or "`impossible`" if it cannot be done.

Sample input

```
5
ACGT
GTAC
A
C
ACGT
TGCA
ACGT
TCGATCGA
A
AAAAAAAAAAAAAAAAAA
```

Output for sample input

```
2
impossible
1
4
6
```