1. **(5 marks)** Write an efficient program that reads an integer n between 1 and 1000000 from the standard input, followed by a newline; reads n strings $S_1, \ldots, S_n$ each of length between 1 and 10000 and consisting of `A`s, `C`s, `G`s and `T`s, terminated with a newline; prints the largest value $k \geq 1$ such that there exists at least one string containing exactly one copy of each distinct k-tuple in $S_1, \ldots, S_n$ and no other k-tuples, followed by a space; and, finally, prints such a string, followed by a newline.

   For example, on the input

```
6
CCAAGATAC
ATTGCCAA
TGCCA
GATACCAGA
ACGATTG
CCAGAGGAC
```

   your program can print

```
5 ACGATTGCCAAGATACCAGAGGAC
```

   because no string contains every 6-tuple in the given strings and no other 6-tuple, and the returned string string contains exactly one copy of each distinct 5-tuple in the given strings and no other 5-tuples.

   Hint: This is basically the same as finding Eulerian tours for the problem on Codeforces (`https://codeforces.com/problemset/problem/508/D`). I apologize for wasting your time with that.