Words 2 X86108_en

Nucleic acid sequences are labeled over the alphabet $\{A, C, G, T\}$, and there are 4^n possible genomic sequences of length n. Amino acid sequences, on the other hand, are labeled over the alphabet $\{A, C, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, Y\}$, and there are 20^n possible proteomic sequences of length n. An interesting problem is the generation of all the genomic sequences with n nucleotides or all the proteomic sequences with n amino acids, that is, the generation of all the words of length n over an alphabet Σ.

Write pseudocode, Python code, and C++ code for the words problem. The program must implement and use the words function in the pseudocode, which must be recursive and is not allowed to perform input/output operations. Make two submissions, including the pseudocode as a comment to both the Python and the C++ code.

Input

The input is an integer n and an alphabet Σ.

Output

The output is a sorted list of all the words of length n over the alphabet Σ.

Sample input 1

```
1
G T A C
```

Sample output 1

```
A
C
G
T
```

Sample input 2

```
2
G T A C
```

Sample output 2

```
AA
AC
AG
AT
CA
CC
CG
CT
GA
GC
GG
GT
TA
TC
TG
TT
```

Sample input 3

```
3
G T A C
```

Sample output 3

```
AAA
AAC
AAG
AAT
```

```
ACA
ACC
ACG
ACT
AGA
AGC
AGG
AGT
ATA
ATC
ATG
ATT
CAA
CAC
CAG
CAT
CCA
CCC
CCG
CCT
CGA
CGC
CGG
CGT
CTA
CTC
CTG
CTT
GAA
GAC
GAG
GAT
GCA
GCC
GCG
GCT
GGA
GGC
GGG
GGT
GTA
GTC
GTG
GTT
TAA
TAC
TAG
TAT
TCA
TCC
TCG
TCT
TGA
TGC
TGG
TGT
TTA
TTC
TTG
TTT
```

Problem information

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