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Word Composition Problem

As part of our interview process, we would like for you to write a solution to the following problem, focusing on **correctness, approach, quality and performance**.

Problem Statement

Write a program that:

1. **Reads** provided files (Input_01.txt and Input_02.txt) containing alphabetically sorted words list (*one word per line, no spaces, all lower case*)
2. **Identifies & display below given data in logs/console/output file**
    - longest compounded word
    - second longest compounded word
    - time taken to process the input file

Note: A compounded word is one that can be constructed by combining (concatenating) shorter words also found in the same file

Input 01

Input_01.txt is a small word list, consisting following words

```
cat
cats
catsdogcats
catxdogcatsrat
dog
dogcatsdog
hippopotamuses
rat
ratcatdogcat
```

Answer:

1. Longest Compound Word: ratcatdogcat
2. Second Longest Compound Word: catsdogcats

Note:

Hippopotamuses is the longest word but that is not the answer as it is not a compounded word

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Input 02

Input_02.txt is a long word list, consisting 100,000+ items

Answer:
1. Longest Compound Word: ethylenediaminetetraacetates
2. Second Longest Compound Word: electroencephalographically

Solution Requirements

This is not just a puzzle or classroom assignment; it is your opportunity to demonstrate your engineering judgment and your technical knowledge in a way that you cannot do in a personal interview. Proper usage of data structures to reduce time complexity of search. Performance matters, the program should return results quickly even for very large lists (100,000+ items).

Deliverables

Please reply to hr@impledge.com with:

1. **Google Drive / GitHub URL** of your source code, written in **any programming language**
2. **ReadMe file** with steps to execute your code, an overview of your program, including your design decisions, approach you took. The ReadMe shouldn't more than a few paragraphs in length.

Important

Any solution available for you on web is available for us too. You can refer web for directions but **do not copy & paste**. Use your own logic.

If you have any questions about the problem, please feel free to email us back.