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** a file containing alphabetically sorted words list (*one word per line, no spaces, all lower case*)
2. **Identifies & displays** **2 longest words** in the file that can be constructed by combining (concatenating) shorter words also found in the file

# Example 1

Words.txt: Small word list, consisting following words

cat

cats

catsdogcats

catxdogcatsrat

dog

dogcatsdog

hippopotamuses

rat

ratcatdogcat

Answer:   
1. Compound Word: ratcatdogcat

2. Compound Word: catsdogcats

# Example 2

Words1.txt: Long word list, consisting 100,000+ items

Answer:   
1. Compound Word: ethylenediaminetetraacetates

2. 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 this email with:

1. **Source code of solution**, written in **C#** language
2. **ReadMe file** with 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.

Please find attached 2 files, **words.txt** and **word1.txt** for testing purposes. If you have any questions about the problem, please feel free to email us back.