Word Composition Problem Solution

Problem Statement

The given problem statement is all about identifying the

1. longest compounded word
2. second-longest compounded word
3. time taken to process the input file

that given with the problem statement containing alphabetically sorted words. A compounded word is one that can be constructed by concatenating shorter words also found in the same file. The solution processes two input files,

1. `Input_01.txt` (small dataset) and
2. `Input_02.txt` (large dataset) .

Approach

- The program uses a "Trie" to store words efficiently and to quickly determine prefixes. This reduces the time complexity of searching for compound words.

- Trie Construction: Words from the input file are inserted into the Trie.
- Queue Processing: A queue is used to store word-suffix pairs for efficient processing of potential compounded words.
- Longest and Second-Longest Identification: Words are evaluated as compounded if their suffixes are either directly present in the Trie or can themselves be further broken into valid words using the Trie.

- By leveraging the Trie and queue, the program ensures efficient prefix lookups and avoids redundant computations.
- Execution time is measured using `std::chrono` for precise performance tracking in milliseconds.

Note : - Before Executing the program please make sure that both the input files are in same directory as the program.
- Make sure you a g++ compiler installed in your system.

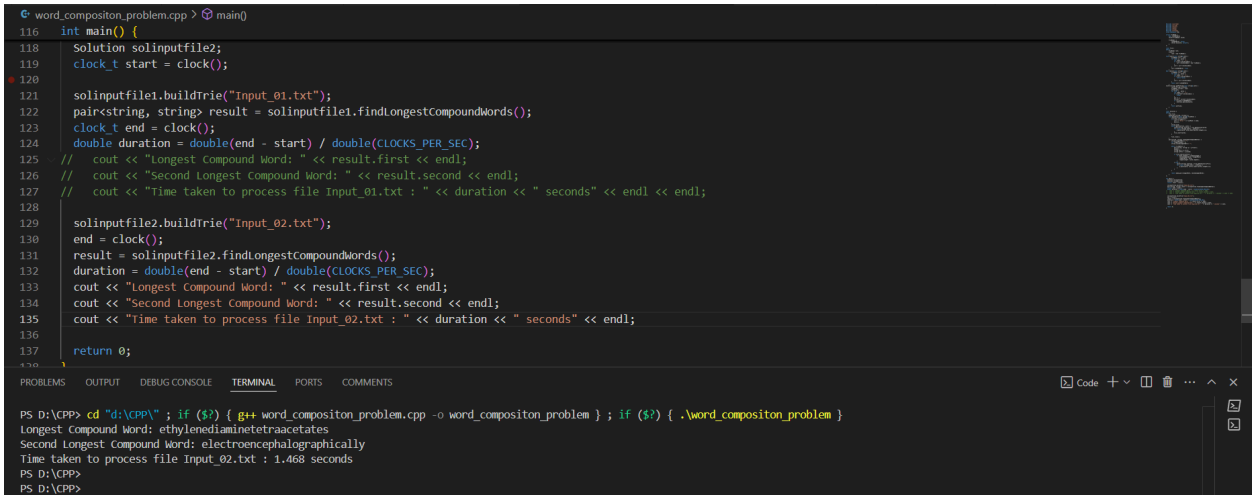
#Steps to Execute
- Open terminal in same directory where your solution is stored.
- To compile the program write following command in terminal/powershell "g++ Solution.cpp" (like “word_compositon_problem.cpp").
- To execute the program write the following command in terminal/powershell "./a.exe" or the name of the compiled file.

Sample Output

For the given sample input files:

Input_01.txt

Input_02.txt



Note: Time taken can be different every time and on any system while compile.

SOLUTION BY ETI GARG