PLAKSHA UNIVERSITY

Spring Semester 2021-22 FM 121 Programming and Data Structures

04-Jun-2022 **COMPREHENSIVE ASSIGNMENT** 20 pts (10%)

The assignment contains two questions to be attempted, each of equal weight. Please work independently on these questions and strictly avoid resorting to any unethical means of solving them. Please use your Linux server accounts to write these programs.

The recommended deadline is 15th of June (Wed.), and early submissions shall be rewarded!

Question #1: Identifying closed-form compound words

English is a very interesting language. That the word *fish* can be spelled as "*ghoti*" illustrates how! In this exercise, you will explore more on word construction.

A compound word in English is formed when two words are combined to form a new word. Closed-form compound words result when two fully independent, unique dictionary words are combined to form a new word. Here are ten examples:

inside = in + side
basketball = basket + ball
skateboard = skate + board
grasshopper = grass + hopper
moonlight = moon + light
menace = men + ace
outage = out + age
likewise = like + wise
attribute = at + tribute
handsome = hand + some

(Note that in case of the first five compound words listed above, one can find a connection between the meanings of the individual words and the compound word. However, in the last five examples, that is not the case!)

Write a complete C++ program that takes a dictionary database (a text file) as input and displays the list of all closed-form compound words that are found in the list.

Some tips:

- Typically, a full dictionary contains a few lakhs of words. So, repeatedly searching the list of words would take an enormous amount of time. The algorithm to solve the problem and choice of data structures should take this into consideration.
- You can explore using various features of the language, e.g., the string class or Standard Template Library (STL) in your program.
- Start validating your program with a small list of words, and then use the dictionary list. You can find a sample dictionary file here: `/home/sharing/dictionary.txt` on the server, which you may copy to your working directory.