

Introduction to Computers and Programming

Bonus Homework 2

2023/11/23

1. Deadline

Hand in your homework via E3 before 2023/12/19 23:55. In addition, make sure that your code can be executed on Visual Studio Community 2019. We will use **Visual Studio** for grading. There is no late submission for the bonus homework.

2. Problems

2.1 Word Ladder Game

The word ladder game was invented by Lewis Carroll in 1877. The idea is to begin with a start word and change one letter at a time until arriving at an end word. Each word along the way must be an English word.

For example, starting from **fish** you can make a word ladder to **mask** through the following ladder: **fish >> wish >> wash >> mash >> mask**

Write a program that **uses recursion** to find the word ladder given a start word and an end word, or determines if no word ladder exists.

Use the attached file "DAMwords.txt" as your dictionary of valid words. This file contains about 70000 words. Your program does not need to find the shortest word ladder between words, any word ladder will do if one exists.

Input

- **User input**
 - Two strings S1 and S2, which will be in the provided file.
- **File input**
 - A text file named "DAMwords.txt".

Output

- All words passed from S1 to S2, including S1 and S2, there is ">>" between two letters.
- If no word ladder exists, output "Does not exist."

Example 1

Input

fish

mask

Output

fish >> wish >> wash >> mash >> mask

Example 2

Input

fly

sea

Output

fly >> ply >> pry >> dry >> day >> say >> bay >> way >> pay >> nay >> fay >> may >>
mat >> maw >> raw >> law >> paw >> pax >> wax >> lax >> tax >> fax >> fat >> pat >>
par >> ear >> war >> mar >> oar >> jar >> jam >> jan >> can >> cat >> vat >> eat >> bat
>> tat >> tap >> tan >> dan >> ran >> man >> ban >> bah >> bag >> nag >> lag >> wag >>
wad >> had >> lad >> sad >> cad >> cid >> kid >> yid >> aid >> bid >> bad >> dad >> gad
>> fad >> fed >> oed >> bed >> led >> lea >> sea

Example 3

Input

adamson

spirits

Output

Does not exist.

3. Submission format

Your submission should follow the format below, or you might get some penalty for the wrong format.

- xxxxxxxxxx_bonus_w2.zip
 - xxxxxxxxxx_hw_01.cpp

xxxxxxx is your student ID

4. Verify

We will use verify.py to check if your answer is correct or not.

If you haven't installed Python IDLE, you can upload verify.ipynb to google drive then upload "DAMwords.txt" to the red box and click on the green box to execute.

Input your answer(output) and the program will check if your answer is correct or not.

