Second assignment (2022/2023, this is the one you need to do, due ??-??-2022)
Word ladder (part 1)

A word ladder is a sequence of words in which two adjacent words differ by one letter. For example, in English, it is possible to go from head to tail in five steps: head → heal → teal → tell → tall → tail. In Portuguese, we can go from tudo to nada in four: tudo → todo → nodo → nado → nada.

The archive `A02.tgz` contains incomplete source code – file `word_ladder.c` – for the second assignment. In it you will find

- comments near the beginning of the file with suggestions about what should be done,
- declarations of some data types (feel free to change them at will, but it is not necessary to do so),
- a very incomplete implementation of a hash table,
- a very incomplete implementation of code to deal with an undirected graph,
- a very incomplete implementation of code to implement the union-find data structure, and
- other miscellaneous code.

At the very least, you should present a complete functionally correct implementation of the hash table, including code that dynamically resizes the hash table array when more stuff is added to the hash table. Discuss with your teacher what else should be done. Use the comments at the beginning of the source code to guide you. If possible, give your own suggestions for other things to do.

In the `A02.tgz` archive you will also find some text files with lists of Portuguese words. Use a small list when developing the program, and the big one only at the end.

Word ladder (part 2, the written report)

The written report must have:

- A title page (front page) with the name of the course, the name of the report, date, the numbers and names of the students, and an estimate of the percentage each student contributed to the project. The sum of percentages should be 100%.
- A short introduction describing the problem.
- A short description of each function that was modified; this should include an explanation of what the function does and how it does it.
- The source of any material adapted from the internet must be properly cited.
- An appendix with all the code. Use a small mono-spaced font such as `courier` or `consolas`.
- **Deliverable (via elearning site): one PDF file. No archives!**

The written report should also have (optional stuff, but if you want a high grade, you should do it):

- A list of interesting word ladders found by your program,
- Code that finds the diameter (largest smallest distance between pairs of vertices) of each connected component,
- Statistics about the data structures used by your program (ask your teacher if you don's have any ideas about this), and
- Confirmation that the program does not have memory leaks.

Of course, you may also do other things not described here. Surprise us!