

Problem 1.

Copy the Project 2 starter code from

<http://www.cs.toronto.edu/~guerzhoy/180/proj/P2/gomoku.py>

Modify the function `put_seq_on_board` so that it first checks whether it's possible to put the new sequence on the board without overwriting any non-empty squares, and puts the sequence on the board only if it is possible to do so without overwriting any non-empty squares. The modified function should print one of:

`"Success",`

`"The exact sequence was already found on the board",`

or

`"Some of the squares are occupied, failed to put the sequence on the board",`

depending on the situation.

Note that this is not part of the requirements of the project, and you should not modify the `put_seq_on_board` that you submit as part of your Project 2.

Problem 2.

Write a program that opens the file `data2.txt` and prints all the lines in it that contain the the word “lol” in any mixture of upper and lower case (note: both the line “they lolled” and the line ‘IOL’ are considered to contain the word “lol.”). Hint: use `str`’s `find` method. Make sure that your output is not double spaced. Test your function by creating a test file called `data2.txt` using a text editor such as `gedit`.

Reminder: here is how to read in text from a file:

```
f = open(<filename>, encoding="latin-1")
#e.g., f = open("data2.txt", encoding="latin-1")

text = f.read()
#text is a string that contains the contents of the entire file
```

Remember that your program and the file `data2.txt` must be in the same folder, and you should run the program in Pyzo using `Run file as script`.

Problem 3.

Complete and test the following function.

```
def dict_to_str(d):
    """Return a str containing each key and value in dict d. Keys and
    values are separated by a comma. Key-value pairs are separated
    by a newline character from each other.
    For example, dict_to_str({1:2, 5:6}) should return "1, 2\n5, 6".
    (the order of the key-value pairs doesn't matter and can be different
    every time).
    """
    pass # replace this with your code
```

Problem 4.

Complete and test the following function.

```
def dict_to_str_sorted(d):
    """Return a str containing each key and value in dict d. Keys and
    values are separated by a comma. Key-value pairs are separated
    by a newline character from each other, and are sorted in
    ascending order by key.
    For example, dict_to_str_sorted({1:2, 0:3, 10:5}) should
    return "0, 3\n1, 2\n10, 5". The keys in the string must be sorted
    in ascending order."""
    pass # replace this with your code
```

Problem 5.

Get marked for the lab while you proceed with this problem.

In this problem, you will write a function that evaluates the Flesch-Kincaid Readability Grade level of a text.¹

The Flesch-Kincaid grade level of a text is defined in Wikipedia as:

$$.39 \frac{\text{total words}}{\text{total sentences}} + 11.8 \frac{\text{total syllables}}{\text{total words}} - 15.59.$$

For a given input text, you should compute its Flesch-Kincaid grade level.

Counting syllables in an English text is not a straightforward task². To approximate the number of syllables in a word, we will count the number of *vowel phones* in a word, counting consecutive vowel phones as one vowel. The decomposition of words into phones (vowel phone and consonant phones) is available from the CMU Pronouncing Dictionary (<http://www.speech.cs.cmu.edu/cgi-bin/cmudict>), and specifically from a file that you can download here:

<http://svn.code.sf.net/p/cmuspinx/code/trunk/cmudict/cmudict-0.7b>

The list of all the vowel and consonant phones in the dictionary is here:

<http://svn.code.sf.net/p/cmuspinx/code/trunk/cmudict/cmudict-0.7b.phones>

¹Flesch-Kincaid scores are not without (harsh) critics, but they can be useful as a first approximation of readability. See, e.g., here <http://languagelog.ldc.upenn.edu/nll/?p=3970> for a critique.

²From Prof. Jackie C.K. Cheung, a computational linguist at McGill University: "[The number of vowel phones does not exactly correspond to the number of syllables in a word.] You can have diphthongs, where #vowels > #syllables. Conversely, you can have syllabic consonants. In English, some accents and some analyses indicate syllabic consonants in words like 'mountain' or 'trouble'."