

## Homework #3 Introduction to Computing

Due: March 5, 2009 (Thursday at 11:59 PM)

### **Flesch-Kincaid Grade Level Program**

Write a program that analyzes a text file to determine its Flesch-Kincaid grade level. The Flesch-Kincaid grade level indicates the approximate grade level of student that could understand the text. Alternatively, it indicates the number of years of education generally required to understand the text. The Flesch-Kincaid grade level is calculated by the formula:

$$0.39 \left( \frac{\text{total number of words}}{\text{total number of sentences}} \right) + 11.8 \left( \frac{\text{total number of syllables}}{\text{total number of words}} \right) - 15.59$$

Use the following definitions for a sentence, word, syllable:

A *sentence* is considered to be any String ending in a '.', ':', ';', '?', or '!'. (Yes, I know this allow sentences that do not represent gramatically correct English sentences)

A *word* is considered to be any elements of a sentence that is separated by spaces, tabs or new lines.

We'll calculate the number of *syllables* in a word by counting the number of groups of adjacent vowels with the exception of an 'e' appearing at the end of a word which does not count as a syllable. For example:

- "simplicity" contains 4 syllables
- "though" contains 1 syllable
- "cleaning" contains 2 syllables
- "yet" contains 1 syllable
- "are" contains 1 syllable
- "syllable" contains 2 syllables.
- "able" contains 1 syllable.

All non-letter's such as digits and punctuation should be treated as non-vowels. For example:

- "myString123" counts as 2 syllables.
- "What?" counts as 1 syllable.

All words must have at least 1 syllable. So, if by the above calculations a word would have 0 syllables it should be reported to have 1 syllable. For example:

- "pqr132" counts as 1 syllable.
- "X=227-314" counts as 1 syllable.

When you write your program, be sure you:

- think about the top-down design before you start to write code
- use meaningful variable names with good style (i.e., useCamelCase or use\_underscores)
- use comments at the start of the program **and** before each function describing what they do (see Program 3-3 on pp. 88-90)
- use a main function (see Program 3-3 on pp. 88-90) located at the top of program with a call to it at the bottom to start execution
- use global constants where appropriate with good style (ALL\_CAPS\_AND\_UNDERSCORES). (Put your global constants after your initial comments describing the program and before your main function definition so they can be found and changed easily in future versions of your program.)

**Submit your homework electronically at [http://math-cs.cns.uni.edu/~schafer/submit/which\\_course.cgi](http://math-cs.cns.uni.edu/~schafer/submit/which_course.cgi)**

**Submit the following files:**

- **gradeLevel.py** (your Python program)
- **design.doc** (or design.txt, or design.rtf) a document describing the design of your program including a hierarchy chart and a little text