

Readability.java

Background:

A Readability Index is a tool for estimating the reading comprehension level necessary to understand a written document. For a given document, the Readability Index is an integer indicating how difficult the document is to understand, with lower numbers indicating greater difficulty. For example, the table below shows typical Readability Index values for some common (and some not-so-common) reading material:

Material	Readability Index
Comics	95
Consumer Ads	82
Sports Illustrated	65
Time	57
New York Times	39
Auto Insurance	10
IRS Tax Code	-6

Readability Indexes are also often translated into the educational level that is usually necessary to understand a document:

Index	Educational Level
91-100	5th Grade
81-90	6th Grade
71-80	7th Grade
66-70	8th Grade
61-66	9th Grade
51-60	High School
31-50	Some College
0-30	College Graduate
< 0	Law School Graduate

A Readability Index is calculated using the following 4 steps:

1. Count the number of sentences in the document.
2. Count the number of words in the document.
3. Count the number of syllables in the document.
4. Compute the index as:

$$\text{Index} = 206.835 - 84.6 * (\text{Syllables} / \text{Words}) - 1.015 * (\text{Words} / \text{Sentences})$$

Assignment:

1. Create the class **Readability** (in the text file Readability.java). This class should open a text file for reading (use **OpenFile**), chosen by the user on the command line, like this:

```
C:\Java> java Readability g.txt
```

Once the text file is opened, the entire file should be read into a single String. Using this String, you should then accomplish 4 tasks:

(a) Count the number of sentences. This will be done in a naive way; simply count the number of punctuation marks in the String (representing the end of each sentence). You will count only five punctuation marks: periods ('.'), colons(':',), semicolons(';'), question marks('?'), and exclamation marks('!').

(b) Count the number of **Words** in the document. Using the single String that contains the text file, construct a single "**Sentence**" (using your **Sentence** class). Count the **Words** (using your **Word** class) in this "**Sentence**".

(c) Count the number of syllables. Use the **Word** and **Sentence** classes, again making use of the single "**Sentence**" created in (b) above.

(d) Compute the Readability Index, using the formula on the preceding page.

Your output should display all four of these values, along with the name of the text file. See the "starter code" at drootr.com.