**Automate Rating Usability of Generated Passwords**

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**Background**

In order to better improve the usability of generated passwords, different components should be measured. A scale has been created to measure the linguistic and phonological difficulty component of these passwords (LDP).

The basis of the LDP scale takes into account previous NIST studies and new observational studies of participants. People tend to decompose passwords into smaller “phrases” at non alphanumeric characters. (~!@#$%^&\*, etc). This decomposition also indicated phrase size was a factor in how people parse passwords. Furthermore, pronounceability of password segments was also a factor reducing memory load.

**What this program does**

This program automates the rating of the LDP scale, producing an output file marking the total LDP score and the score at every step of the algorithm.

**Usage**

Run the program. Enter the name of the desired output file. The program will output text describing the rating of the LDP at each step.

**Input**

A text file containing passwords, each separated by a newline.

Example:

Hbo31.

Qce52'

Hmfw361)

Cat72?#

TYpdx4463\*

Xduwrf5143);

UCqmv802</

EHVnim6043%'

QMifnh455230\_$

Rmofpaf2207#)^

**Output**

Output is a CSV file formatted like the following:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Password | Symbol start | # chunks | # characters | Un-sentence like caps | mixed character string | pronounceable | LDP |
| Hbo31. | 0 | 0 | 2 | 0 | 0 | -1 | 1 |
| Qce52' | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| Hmfw361) | 0 | 0 | 3 | 0 | 0 | -1 | 2 |
| Cat72?# | 0 | 1 | 2 | 0 | 0 | -1 | 2 |
| TYpdx4463\* | 0 | 0 | 4 | 1 | 0 | -1 | 4 |
| Xduwrf5143); | 0 | 1 | 4 | 0 | 0 | -1 | 4 |
| UCqmv802</ | 0 | 1 | 3 | 1 | 0 | 0 | 5 |
| EHVnim6043%' | 0 | 1 | 4 | 1 | 0 | -1 | 5 |
| QMifnh455230\_$ | 0 | 1 | 5 | 1 | 0 | -1 | 6 |
| Rmofpaf2207#)^ | 0 | 1 | 5 | 0 | 0 | -1 | 5 |

The algorithm used in this program is broken into 6 steps:

**Step 1**: Parse by symbol.

If the first character of the given password is a character, add one point to the LDP.

Step 1.5: Break password into “phrases”.

**Step 2**: Count number of phrases.

Is the number of phrases is 1 or 2, add nothing to the LDP. Otherwise, add value to the LDP based on:

LDP = ( (phrase-size – 3) x 2) + 1

The following steps apply to each individual phrase within a password.

**Step 3**: Calculate phrase size

Add LDP points for each phrase based on the following:

|  |  |
| --- | --- |
| Phrase size | LDP assigned |
| 1 <= x <= 3 | 0 |
| 4 <= x <= 5 | 1 |
| 6 <= x <= 7 | 2 |
| 8 <= x <= 9 | 3 |
| 10 <= x <= 11 | 4 |
| 2 <= x <= 13 | 5 |

The LDP for each phrase should be summed to form the total LDP for this step. Also, symbols will not be considered for the next steps.

**Step 4**: Un-sentence like capitalization

Consider only strings of characters within each phrase. If there is a capitalized letter in a position other than the start of the string, add one point for that phrase. A maximum of one point will be added for each phrase.

The LDP for each phrase should be summed to form the total LDP for this step.

**Step 5**: Mixed character strings

If a phrase has 3 or more characters and has any strings of characters that contain numbers and letters mixed together (following the pattern L(N\*)L or N(L\*)N), add 1 to the LDP.

**Step 6**: Pronounceable character sequence

If a given phrase has a sequence of characters with a pronounceable character sequence (described in the Determining the Degree of Pronounceability for a generated character sequence document), subtract 1 point from the LDP.