

Rap and text generation : how a rap text can be generated considering the metrical and lexical questions

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Research Question

Can you make a machine rap ? Or at least be a ghostwriter ? And, a good one too ! We tried to answer to this question by looking at what existed already, and started doing research on the CMU Pronouncing Dictionary [1] and text-generating projects. We therefore designed our NN and our analysis on pre-existing work, and integrated several constraints we had, like the syllable count for the pronunciation, the line length... We used, as you can see, Kanye West's texts, because they are very diverse and well known.

Our main goal is to produce a more precise model for rap lyrics generation by ghostwriting K. W.'s lyrics [2], another of our goals being to produce a coherent new rap text, being consistent with the K. W.'s lines and giving the impression that K. W. has written new lyrics.

Methods

We used Python, TensorFlow library and the Text predictor project [3] as a basis for the text generation, to which we initially wanted to add the linguistic part through the use of the CMU Pronouncing Dictionary, allowing us to read the generated text produced with the good accents, considering the word's syllable(s) and the metric of the sentence. We used a set of lyrics from the Rap Genius website, that we got thanks to a scraper [4]. The training ran for about 113 000 iterations.

We then calculated the similarity between the verses generated and K. West's verses, to see if our generated lyrics were the "freshest" plus a calculation of the syllables density and the line length enabling us to see if the produced line resemble to the artist's one, or is even better than what has produced K. West. You can see the evolution below.

V.1 - Iteration 1000

Cause I greaves in night
I been if ain't kidsiin than in't friends, what I like Im
And by ins, Mes fiends
And a contromity tapissed tryna take
(aosp) Whose shallin in throuctifing
This just right nigga get todd in the aintion it
You mean I way you can't timatin of I feel it wanna gards belied
Pleep!
Her new, thissle new killin', get reak, what I guestin, are my
take for it for you
What n
night blackak can devile us, morace Roc-Croby Will just my
ocident?

V.2 - Iteration 55.000

I'm a Polo dick right now, I gree at her Ill
Every to the leaves
I know Im three
I speak to the most head that brother""
(Yeezy taught me, I had give him) on hot!
How you turned girls junior, homie
He lost his soul
To eat bill of the lights
But my sight is better tonight
And my girl you laugh with that
Good did they lanes that he does 2 & Phatry taste bottles
Plus all the way this daughter, passacades (All of the lights)

V.3 - Iteration 110.000

Now throw ya hands up hustlers, busters, boosters, hoes

[Verse 4: Kanye West]
Strap kicked at me Bustack
Loyee oyee or suits of the leaves
Yeah I used to lose helped

[Verse 3: Designer]
I got a plan, I spit this people for Beans of y'all
Lookin' at my own money, while y'all niggas packs
You know the shit reason, ah school bust you can't connect
When you gon' end up up

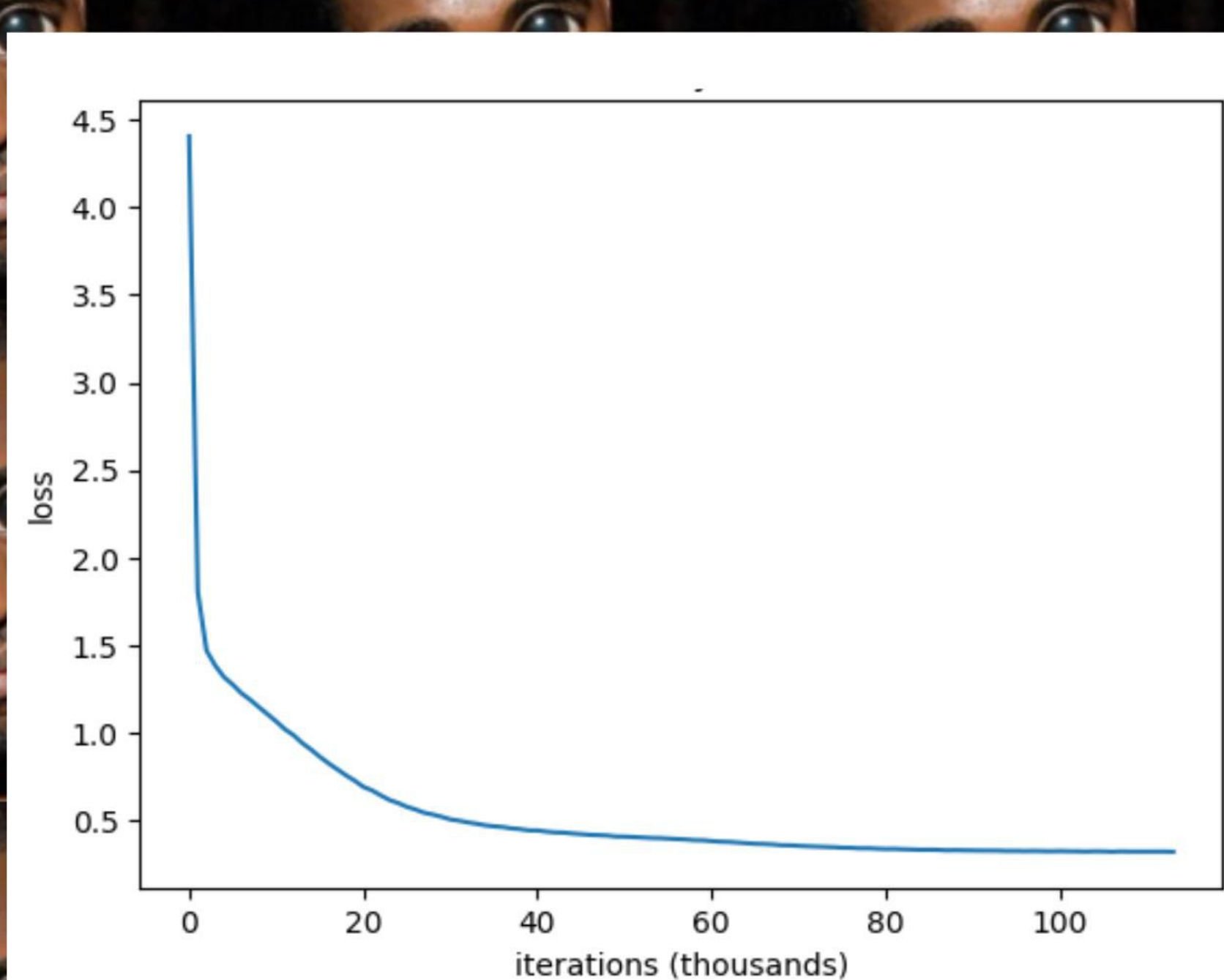


Fig. n°1 : rate of similarity between the generated rap text and the original artist

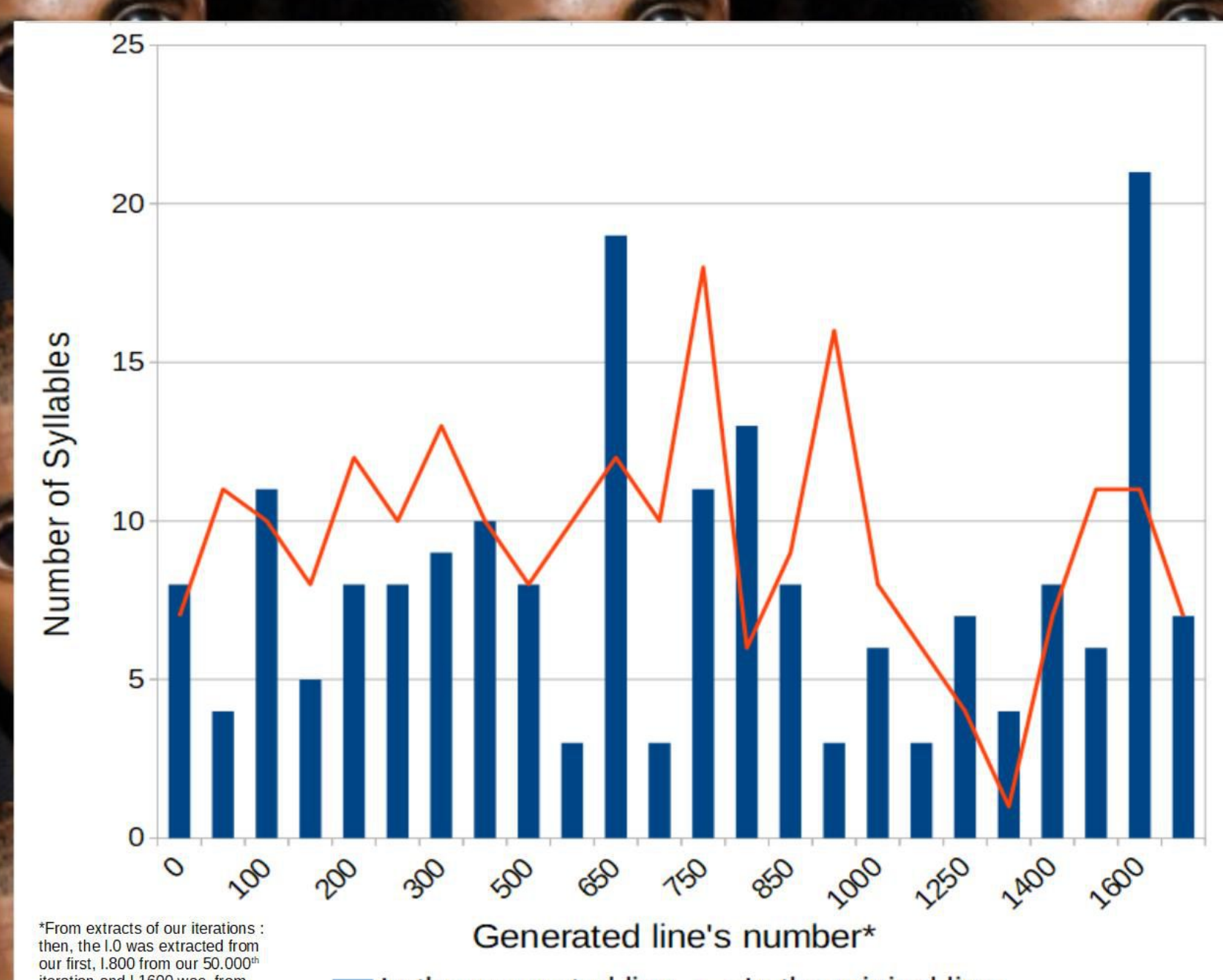


Fig. n°2 : syllables density per line

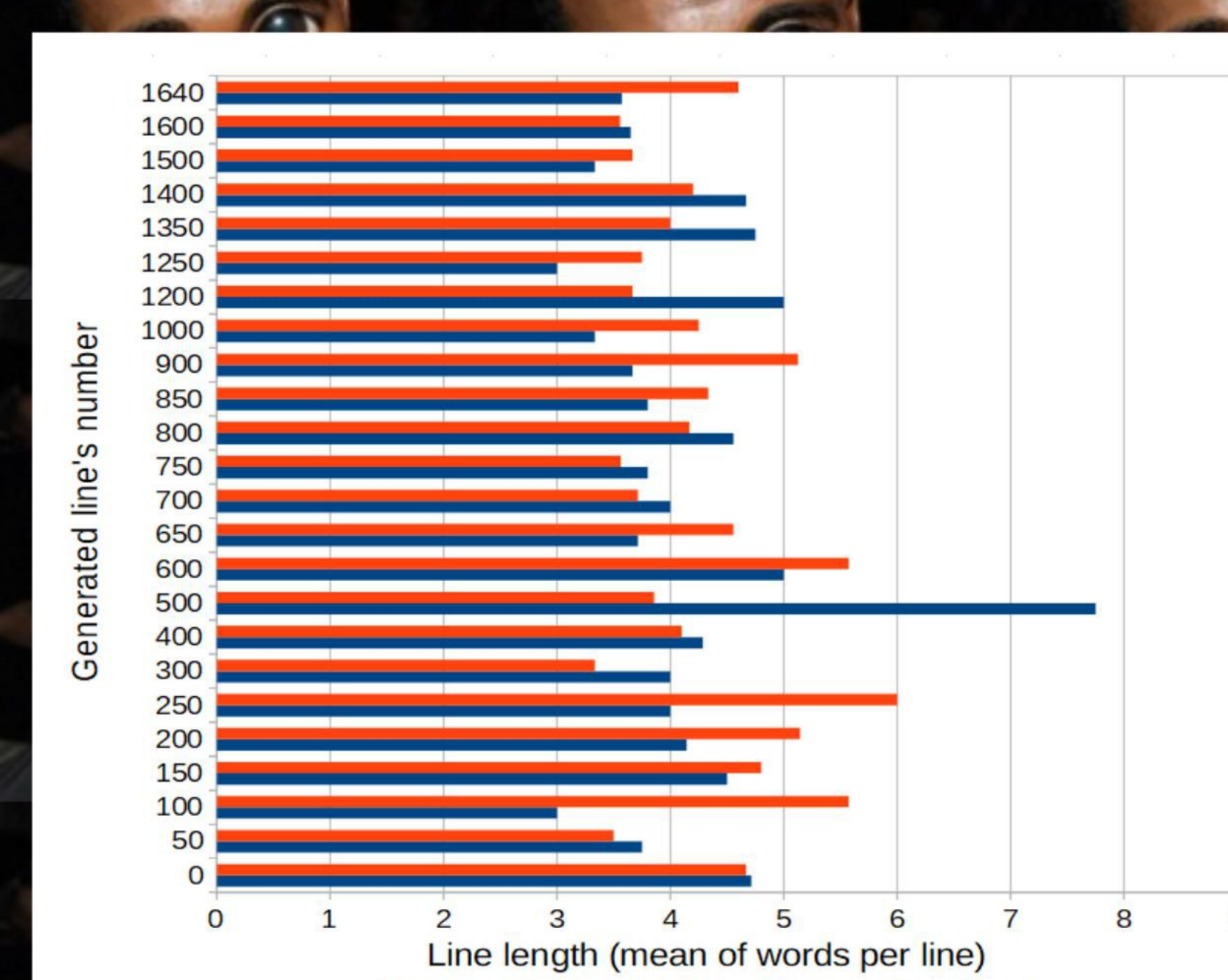


Fig. n°3 : metrical length

Results and Discussion

The first generated texts made no sense : most of the words didn't exist, or had no meaning in the context they were written in : most of the words did not exist in the CMU dictionary. Shortened, mixed (ex : "nigga", "tryna"; really usual in K. W. texts) or misspelled (ex : "ocident") words were also unrecognised

Syllables average in the generated lines (≈ 8 syl. /line) close to the one of the original text (≈ 9.3 syl. /line) (cf fig. 2). We also had to consider that Kanye W. uses shortened words, and interjection, which complicated the analysis. Lines length remains close from the K. W. lines' length (average for both of them $\approx 4,1 - 4,3$ words) (cf fig. 3).

After a hundred of thousands iterations, the rate of similarity is close from 0, meaning that between the verses' corpus from K. W. and our corpus of verses, there are fewer and fewer losses : we could think that K. W. has written a new text and imagine most of the generated text been rapped, having been properly annotated with the names of the rappers in our final iteration (cf V.3). It could be interesting to integrate in this kind of program a dictionary that recognizes not the word as a whole but first every syllables of every word, even if it has no sense or contains mistakes in its spelling.

References

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