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8. Statistical Analysis

This series of tutorials is based upon work from COST Action **Multi3Generation CA18231**, supported by COST (European Cooperation in Science and Technology).

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Importance/Relevance of a concept/theme in a corpus

- By applying regular grammars to a corpus, NooJ users can locate words, terms, lexical fields, themes, concepts and expressions, and build the corresponding concordances.

- How to determine if the resulting concordance is interesting or not?

- Does a theme appear in an *interesting* way, in a chapter of a novel (*e.g.*, love), in a political debate (immigration), in a newspaper (Middle East), in accident insurance reports (left front axle), or in product reviews (antennagate)?

Importance/Relevance of a concept/theme

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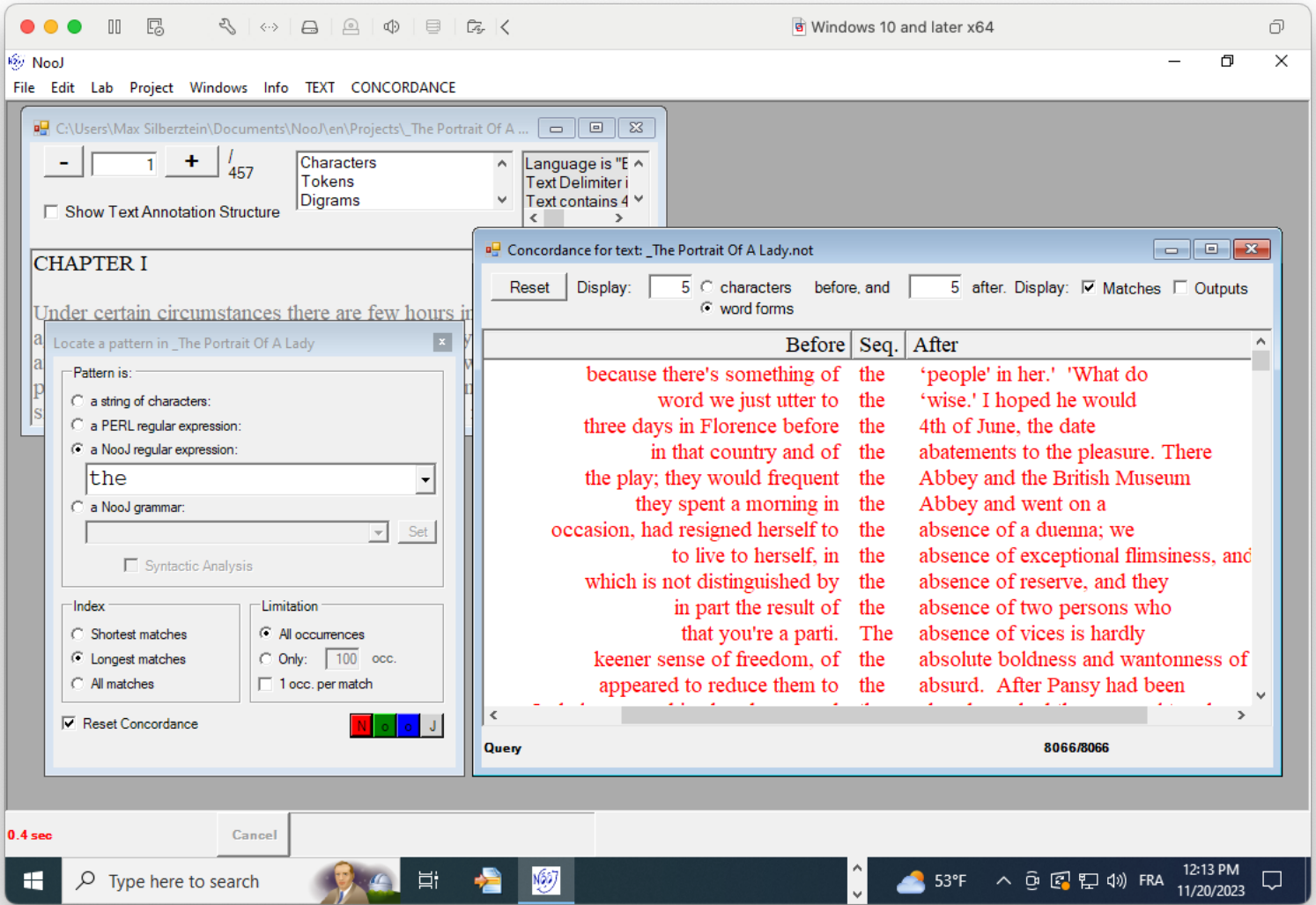
- But, the word “the” occurs very frequently in any English text; it does not mean that it is specifically relevant to a given novel

Importance/Relevance of a concept/theme

- The word “the” has 8,066 occurrences in The Portrait Of A Lady. But that is not very interesting...



Importance/Relevance of a concept/theme

What is important is not the frequency by itself, but the difference between what we expect and what we find:

- We expect any English text to contain many occurrences of the word “the”; we find out that there is indeed a large number of occurrences ⇨ no surprise, not interesting.

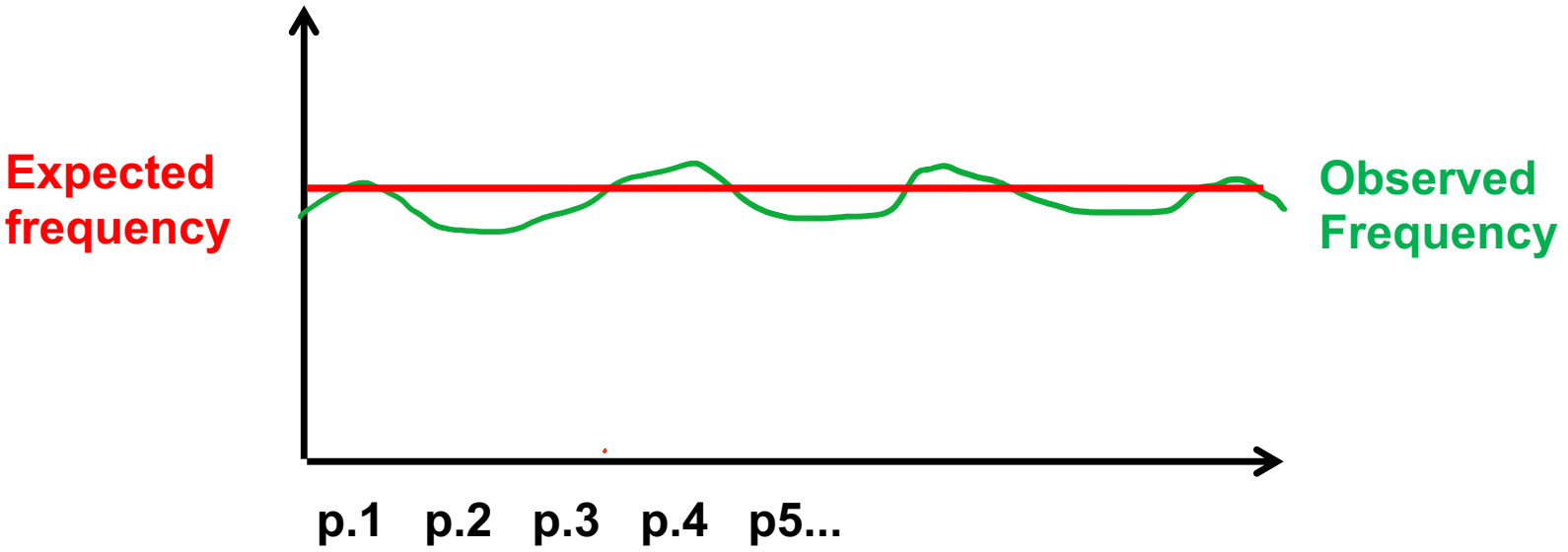
- We expect to find absolutely zero occurrence of the term COVID in newspapers from the XXth century. But if we were to find even only one occurrence
  ⇨ that would be extremely interesting!

Importance/Relevance of a concept/theme

- We are going to look for differences between the **expected** and **observed** frequencies.

Importance/Relevance of a concept/theme

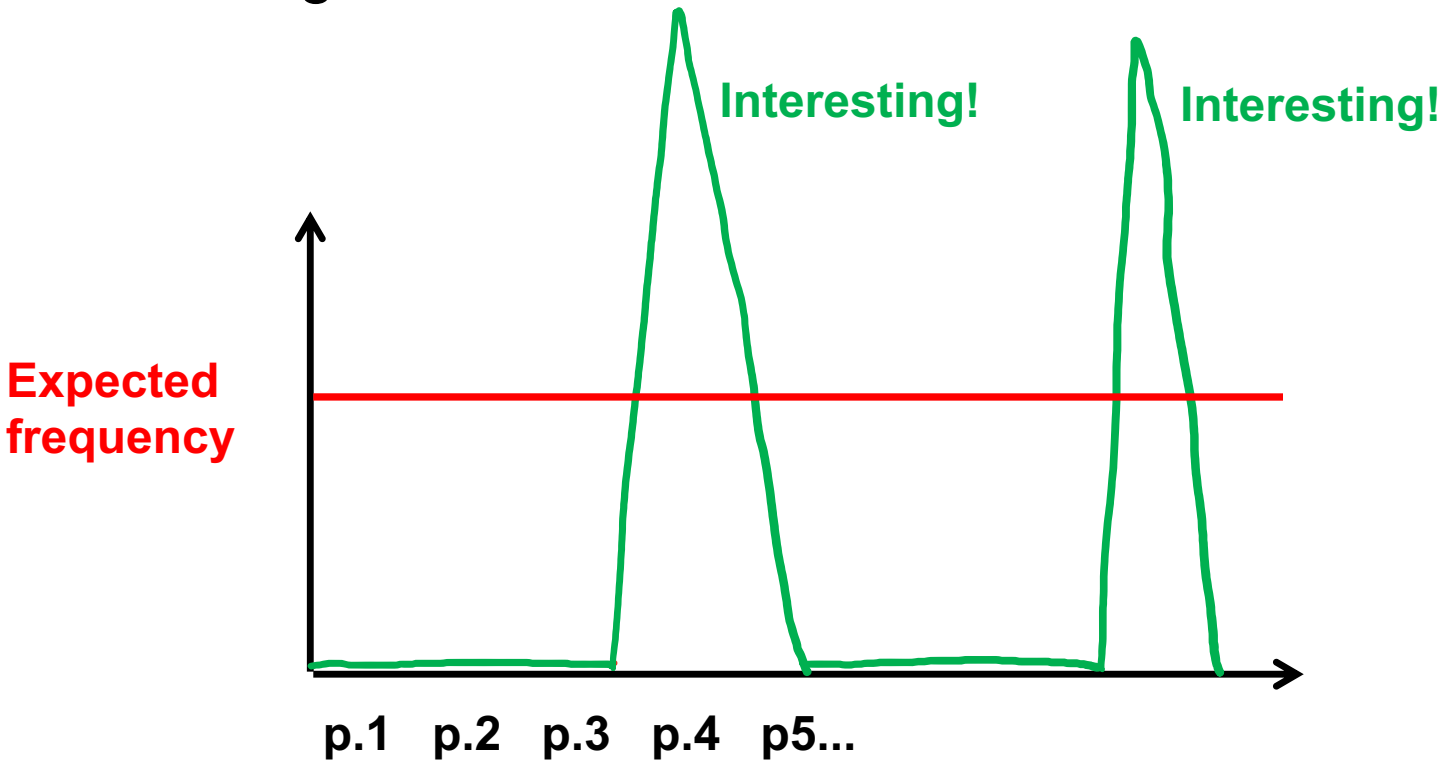
- Let's say we have a 100-page text.
- We look for the word "the".
- The resulting concordance contains 1,000 occurrences.



⇨ We expect each page of the text to contain aproximately 10 occurrences of the word "the"

Importance/Relevance of a concept/theme

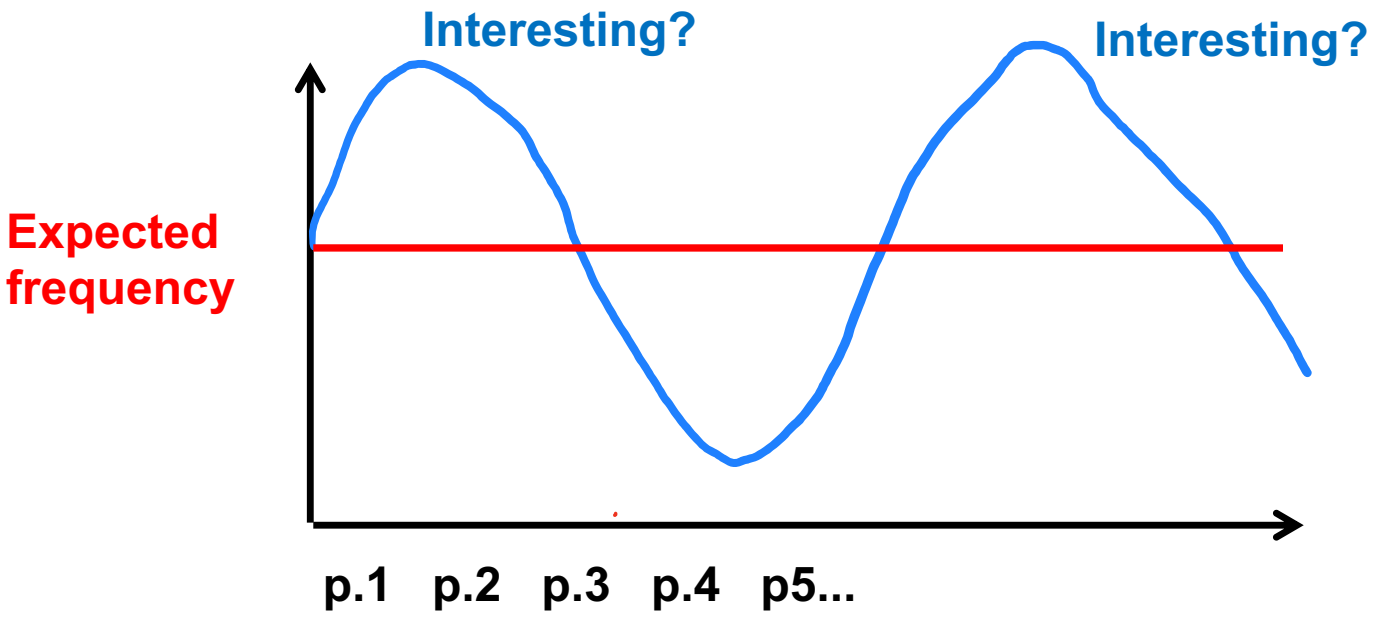
- Now we look for the word “killed”
- The resulting concordance also contains 1,000 occurrences.



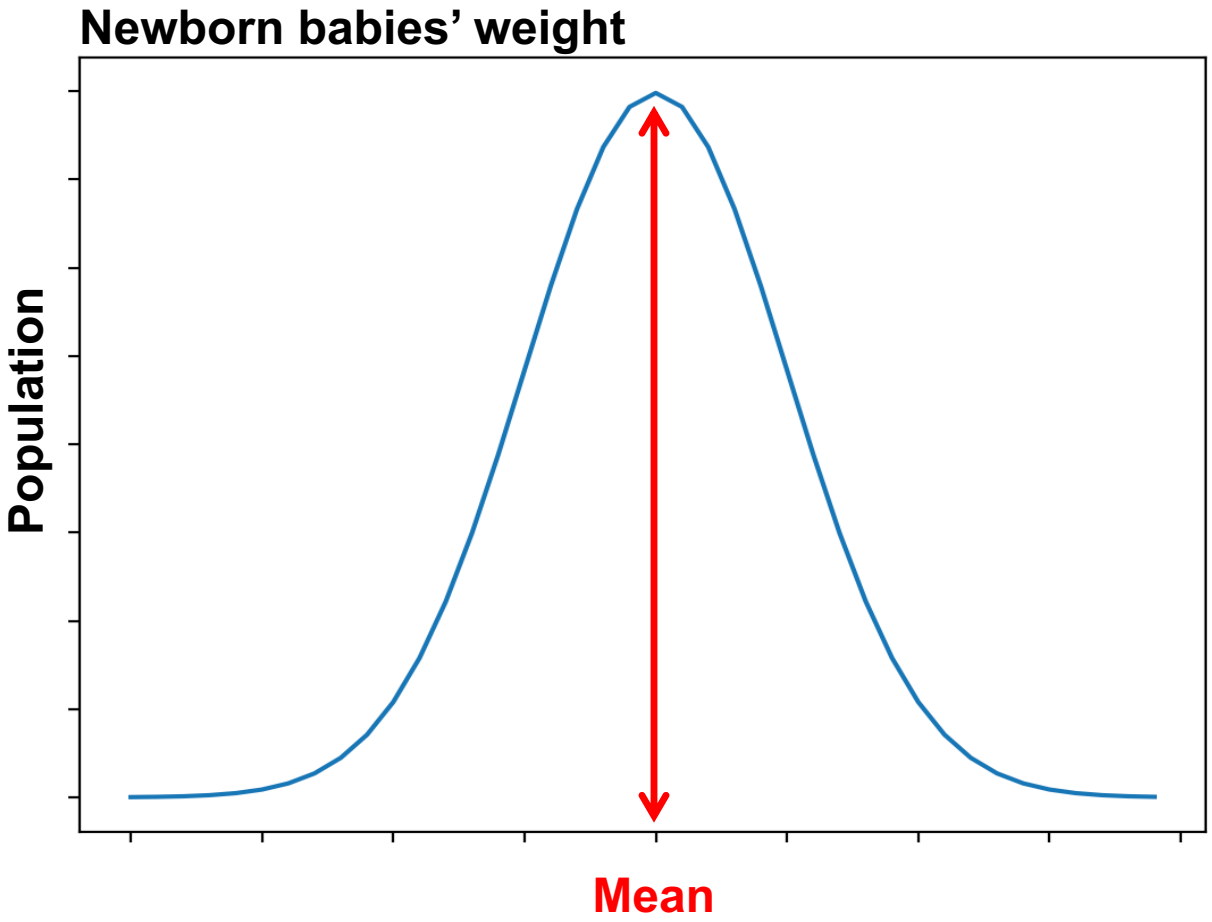
⇨ All occurrences of the word “killed” occur only in two small sections of the text

Importance/Relevance of a concept/theme

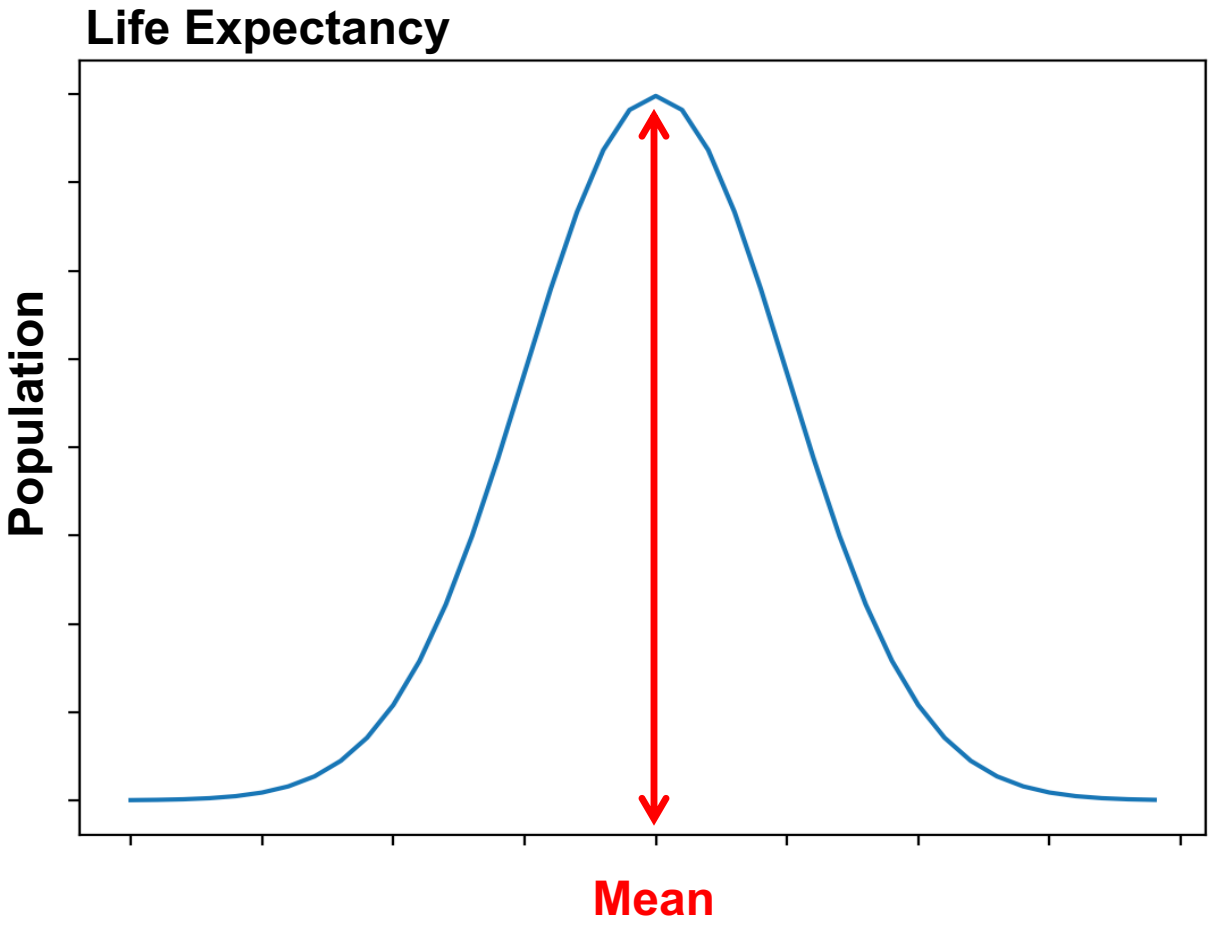
- Between these two extreme cases, how to decide if a



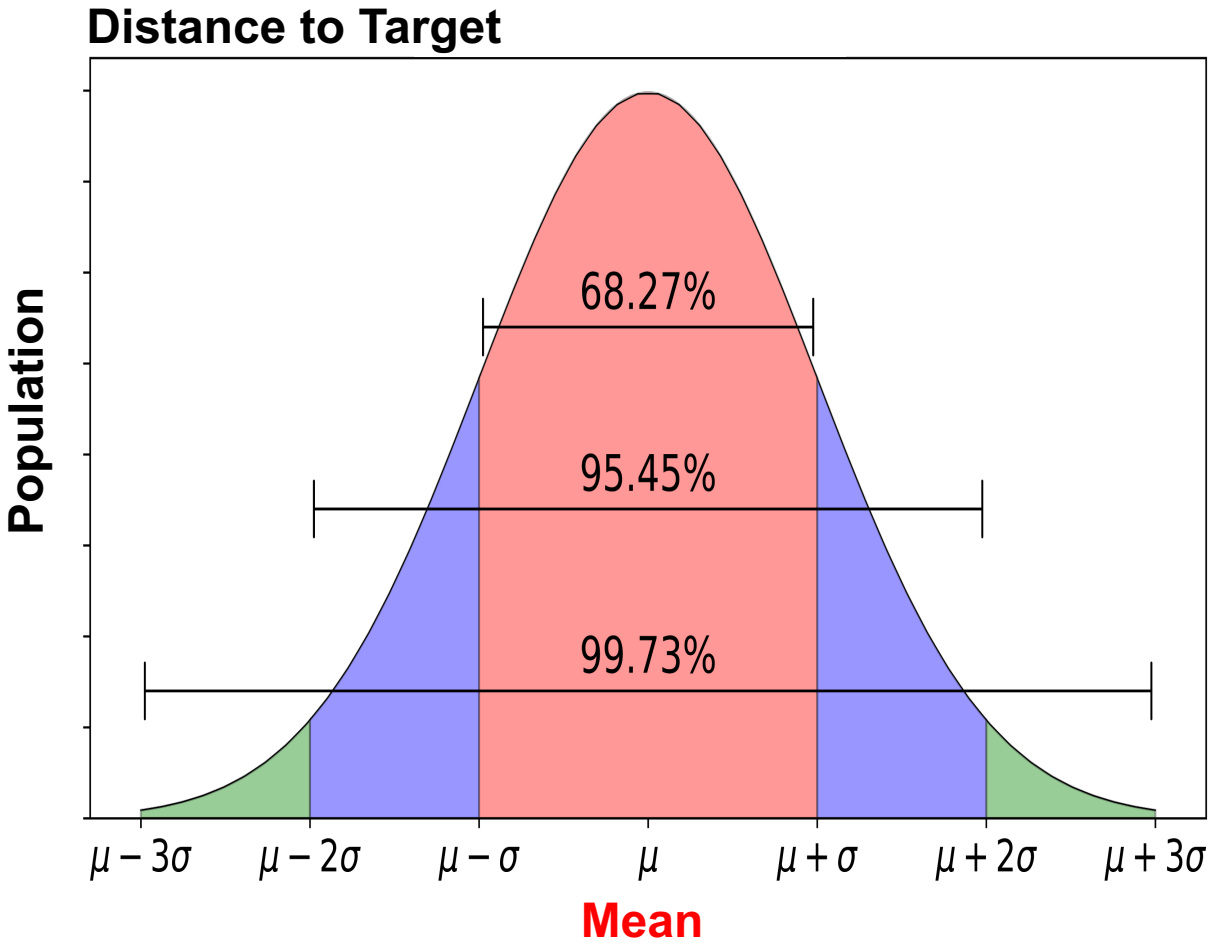
Gauss Normal Distribution



Gauss Normal Distribution

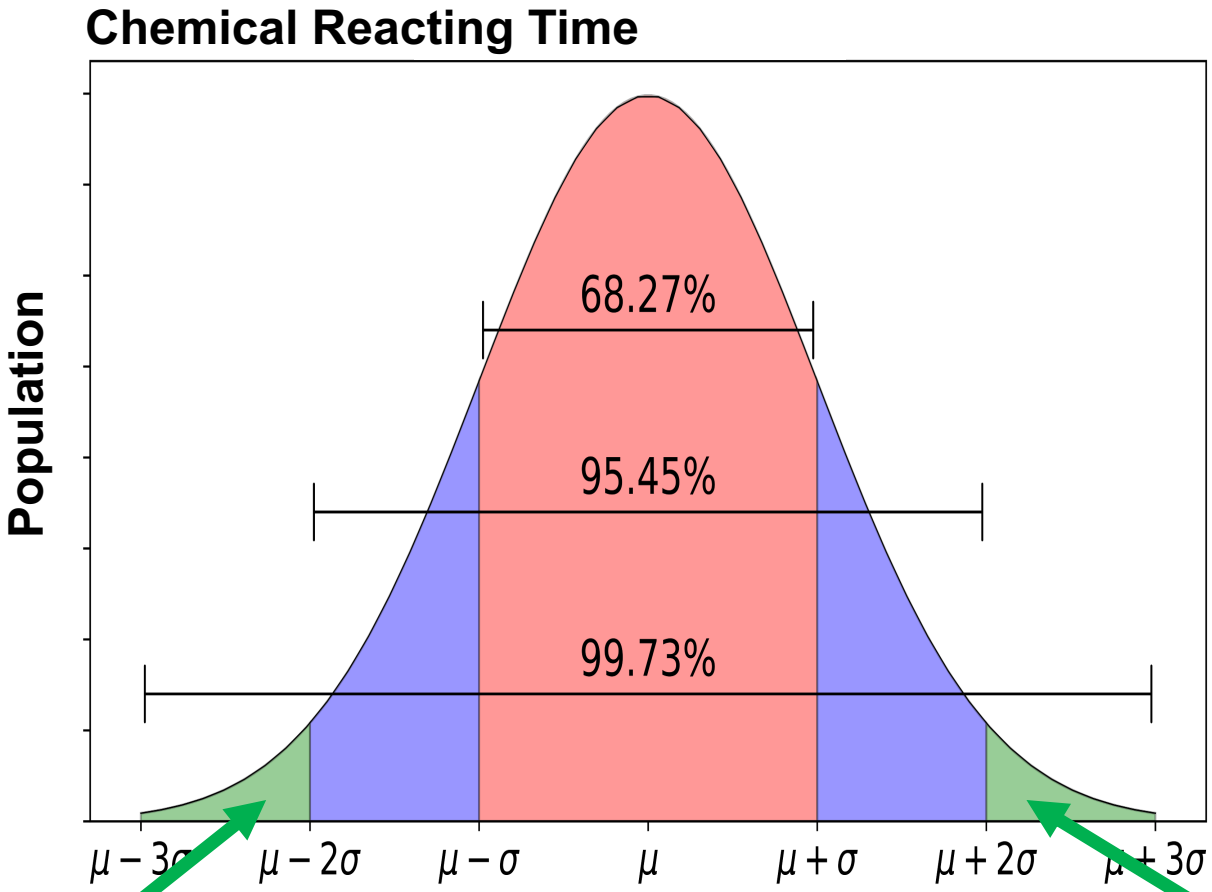


Gauss Normal Distribution



μ: Mean
σ: Standard Deviation

Gauss Normal Distribution



< μ - 2 σ
EXCEPTIONAL

> μ + 2 σ
EXCEPTIONAL

μ: Mean
σ: Standard Deviation

Standard Score

- Standard Scores evaluates the distance between a given value and the mean in a population
- If > 2, then the measure is abnormaly high ⇨ very interesting
- If < -2, then the measure is abnormaly low ⇨ very interesting
- Between -2 and +2, the value is located within the range of normal values, *i.e.*, not surprising, not interesting.

CONCORDANCE > Standard Score

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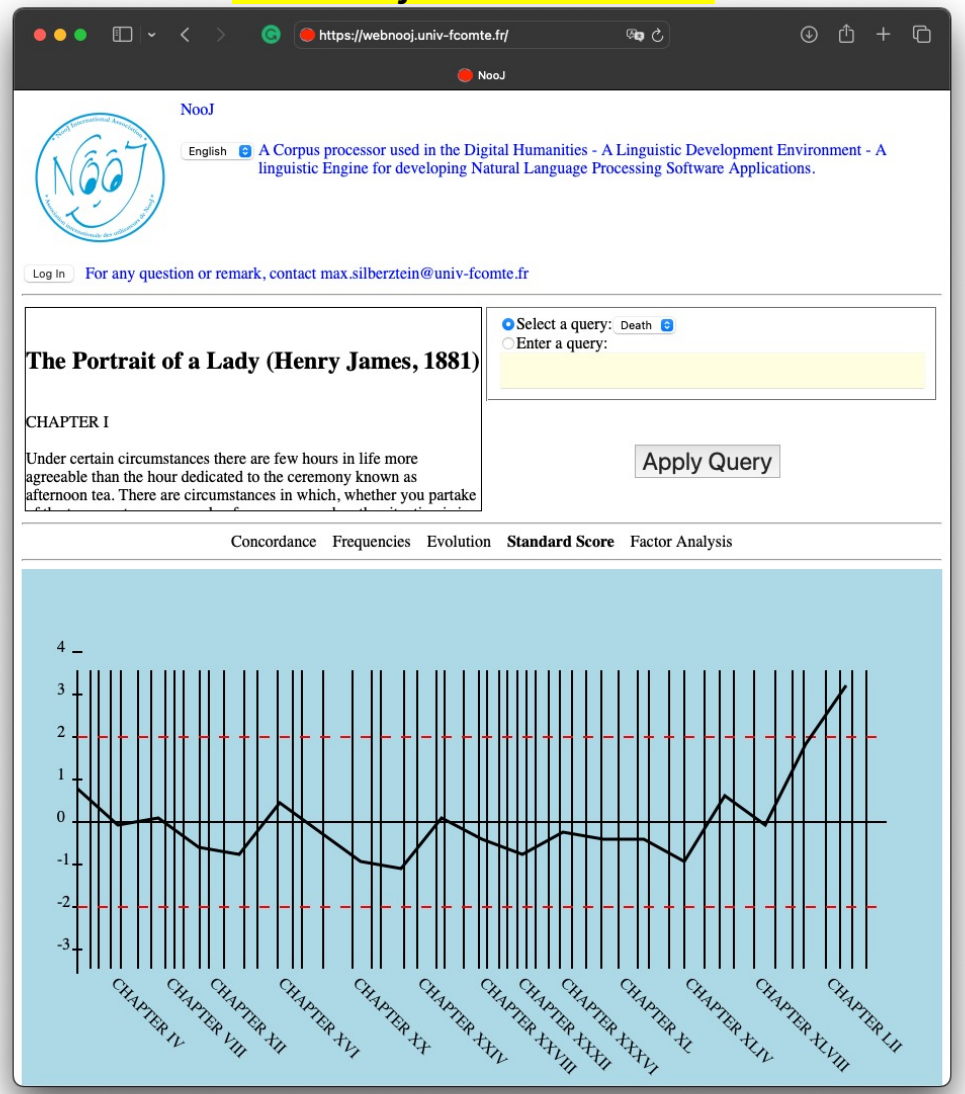

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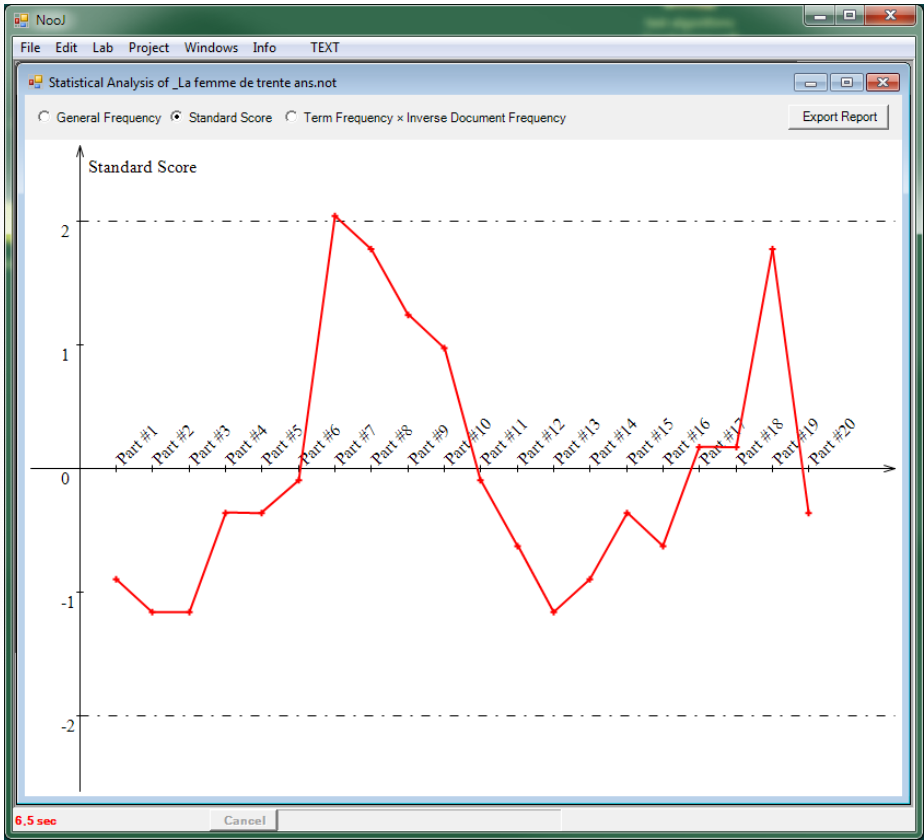



CONGRATULATIONS


You know how to perform a standard score analysis of any linguistic unit that can be recognized by a NooJ grammar