**Natural Language Calculator**

**Formal Languages and Compilers Project 2024/2025**

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**General explanation**: We built a calculator, which does not get its input as numbers and operations, but as textual commands in English language. Next to the standard operations, our compiler provides the possibility of assignments and insertions, Boolean expressions and relations, while and if functions and measuring units at the end of a number.

Since, we extended the files of the lecture, we also implemented a list which works as symbol table and in which Tokens are stored with their associated attributes. The symbol table does also contain a type-checker for the tokens which should be stored there. All basic operations like insert, delete and lookup are provided.

Our compiler can process the following features:

* **Integers** (positive and negative) until billions
* **Double**-precision floating-point numbers
* **Booleans**
* **Control statements**:
  + While
  + If/else
* **Mathematical relations**:
  + Smaller (<)
  + Equal (=)
  + Greater (>)
  + Smaller equal (<=)
  + Greater equal (>=)
  + Different (!=)
* **Computations**:
  + Addition
  + Subtraction
  + Multiplication
  + Division
  + Exponentiation
  + Factorial
* **Measurements**:
  + Weight (kilogram, milligram, pounds, tons)
  + Time (days, hours, seconds, milliseconds)
  + Space (kilometers, centimeters, millimeters, miles, feet, inches)
  + Volume (liter, milliliter)
* **Percentage** **calculations**
* **Variable assignments** via symbol table, supporting:
  + Booleans
  + Computations
  + Identifiers
  + Control statements
  + Any of the above expressions enclosed in brackets

Where you can:

* Add new variables
* Change existing variables
* Retrieve existing variables