# Design (Q2)

## Design-Grammar

First approach was to map out the non-terminal rules with extreme specificity (i.e. S -> NP VPpast, VPpast -> Vpast inf\_clause, inf\_clause -> toinf VPpresent, etc). This was done to get an understanding of the features that would be needed. Then I grouped them together to simplify the grammar (i.e. S -> NP VP, VP -> V inf\_clause). After that it was a matter of looking over the starter code and figuring out how to implement it with the rules and which new subtypes/features needed to be added.

## Design-Lexica

For nouns the lexicon contains both singular and plural forms. While for verbs only present and past tense are accounted for. Verbs were given features to keep track of their thematic roles (i.e., who their agent, theme, experiencer, and beneficiary are (where applicable)).

# Limitations

The current grammar cannot handle present tense (“students sleep”) and as such it can also not handle all subject-verb agreements (i.e. “the student sleeps”).

# Testing Strategy

Key things that were tested for both questions were general grammar rules.

1. The given test sentence “she fed the dog with puppies with him”
2. That singular nouns could not start a sentence (\*”dog fed puppies”)
3. The determiner “the” could attach to any noun
4. That nominals could not appear in the middle of a sentence while nouns like “he” could not appear at the beginning of a sentence. (\*”he fed puppies”, \*”he fed she”)
5. Since “fed” requires a direct object it was made sure that a sentence couldn’t end on “fed”. (\*”she, fed”)
6. Finally, tests were done to ensure that prepositions could not follow pronouns. (\*”she fed him with puppies”).