Exercise 2:

1. **Analyse** the sentence "All prime numbers greater than two are odd"
   a) Using the quantifier $\forall/(o(o\tau))$
   b) Using the restricted quantifier *All*/$((o(o\tau))(o\tau))$

   Hint: The set of prime numbers greater than 2 is constructed like this:
   $\lambda x\ [[^0\mathit{Prime}\ x] \wedge [^0> x\ ^0 2]]$

2. **Analyse** the sentence „There is an even prime number" using the quantifier $\exists/(o(o\tau))$.

3. **Analyse** the following argument and **explain** why the argument is ***not valid*:**

   The Mayor of Ostrava is Tomáš Macura.
   The rector of VŠB-TU wants to become the mayor of Ostrava.
   ———————————————————————————————
   The rector of VŠB-TU wants to become Tomáš Macura.

   Hint: The expression "wants to become" denotes relation-in-intension of an individual to an individual office, i.e., an entity of type $(o\iota_{\tau\omega})_{\tau\omega}$.

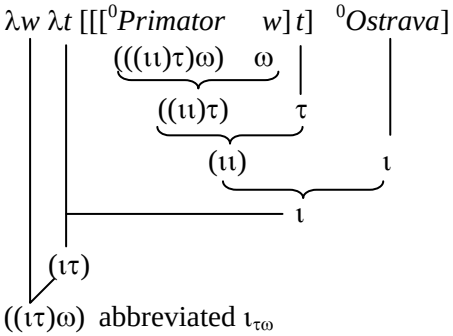
   The office of the mayor of Ostrava is constructed by the Closure (see Exercise 1)
   $\lambda w \lambda t\ [^0\mathit{Mayor\_of}_{wt}\ ^0\mathit{Ostrava}]$.

Recall the method of analysis:

a) Assign **types** to the objects the analysed expression *E* talks about
b) ***Compose constructions*** of these objects so that to construct the object denoted by the whole expression *V*.
   Semantically simple terms are furnished with *Trivialization* of the object denoted by the term
c) ***Type-theoretical checking***. Draw the derivation tree of the resulting construction

Example: The analysis of "the mayor of Ostrava"

a) Types: *Mayor_of*/$(((\iota\iota)\tau)\omega)$, or $(\iota\iota)_{\tau\omega}$ for short; *Ostrava*/ι, *the mayor of Ostrava*/$\iota_{\tau\omega}$
b) Synthesis: $\lambda w \lambda t\ [^0\mathit{Mayor\_of}_{wt}\ ^0\mathit{Ostrava}]$
c) Type checking:



TIL 2017