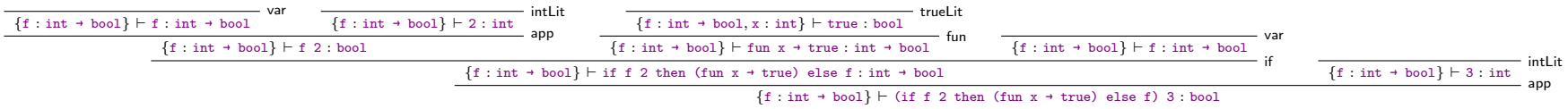
Assignment 3 Written Solutions

Typing Derivation to English

Suppose that `f` is a variable of type `int → bool`. The expressions `2` and `3` are of type `int` under this assumption (i.e., in the context where `f` is declared to be of type `int → bool`) by the intLit rule, so it must be that `2 + 3` is of type `int` under this assumption as well by the addInt rule. The expression `f` is of type `int → bool` under this assumption by the var rule. And since `f` is a function and its input type matches the type of `2 + 3`, we know that `f (2 + 3)` has type `bool` (i.e., the output type of `f`) under this assumption.

Note: This is a *top-down* reading of the derivation. A *bottom-up* reading, like what we did in lecture, is also fine.

Typing Derivation



Semantic Derviation