

A Denotational Semantics for STLC

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Abstract. Just some notes trying out “ \LaTeX literate Agda mode” as I work through this next chapter on the lambda calculus (eventually denotational semantics for the untyped version of the calculus).

1 Intro to the Lambda Calculus

The lambda calculus, first published by Alonzo Church in 1932 is a minimal calculus with only three syntactic constructs: variables, abstraction, and (function) application.

The *simply typed lambda calculus* (STLC) is a variant of the lambda calculus published in 1940 that adds types to the o.g. 1932 untyped lambda calculus. It has the three types of constructions previously mentioned plus additional syntax to support types and type annotations. These notes use a ‘Programmable Computable Function’ (PCF) style syntax and add operations for naturals and recursive function definitions.

These notes formalize the base constructs that make up the simply-typed lambda calculus, its syntax, small-step semantics and typing rules

1.1 A Subsection Sample

Please note that the first paragraph of a section or subsection is not indented. The first paragraph that follows a table, figure, equation etc. does not need an indent, either.