

A set of terms. A term  $t$  belongs to a type  $T$  if it can be determined statically that  $t$  evaluates to a value of a form that  $T$  is trying to represent.

The smallest binary relation between terms and types that satisfies the language's type rules.

... *typable* or *well typed*.

The *inversion* (or *generation*) *lemma*, which for any typing statement in the language shows how the proof could be generated, using nothing more than the typing relation.

Using a *typing derivation* which is a tree of applications of typing rules in which every leaf ends with a typing rule that is an axiom.

The term is not in a *canonical form* (a value) but no further evaluation rules apply.

If the type system is sound a well-typed term when evaluated will not reach a "stuck state".

By proving *progress* and *preservation* properties.

Progress: well-typed terms are not stuck (*i.e.*, they can make progress).

Preservation: an evaluation step of a well-typed term results in another well-typed term.



The statement " $t$  has type  $T$ " remains true even as its subject ( $t$ ) is reduced.