

Δενοτατιοναλ Σεμαντιχο (Denotational Semantics)

Formal Semantics

What does $y := f(x) + x$ mean?

- y is assigned the value of $f(x) + x$
 - y becomes a pointer to the result of $f(x) + x$
 - $f(x)$ may or may not have side effects
 - statement is undefined if types aren't equivalent
 - statement is undefined if types aren't compatible
 - etc
- Need formal semantics to make meanings of programs unambiguous.

Utility of Formal Semantics

- Handy for:
 - language design
 - proofs of correctness
 - language implementation
 - reasoning about programs
 - providing a clear specification of behavior