Program State and Semantics

- The semantics of a programming language is a precise definition of the meaning of any program that is syntactically and type-wise correct

- Ways to define the semantics
  - Operational semantics
  - Axiomatize semantics
  - Denotational semantics

- The state of a program is the binding of all variables to their current values
  - A state is a set of ordered pairs
  - A program can have more than one state

- Meaning Function of Clite
  - The functions operating on the program state are meaning functions.

- Program Semantics
  - The meaning of a Program is defined to be the meaning of its body when given an initial state consisting of the variables of decpart, each initialized to the undef value corresponding to its declared type

- InitialState in Programming Languages
  - C does not initialize the memory space.
  - Java requires the variables being initialized before using.

Expression Semantics

- The meaning function of an expression is a function that given a current state produces a value.

- Meaning function of ApplyBinary