3. A General Static Analysis Framework Based on a Compositional Semantics

20190065 김기환 (kimkihwan@kaist.ac.kr)

* Input-Output Semantic = Input set → Output set (Non-deterministic)
* Program State = Memory State + Control State
* Memory State = Describe all assigned value of variables.
* Semantics of scalar =

* Semantics of Boolean =

* Filtering function =
* Semantics of command =

*note. semantic of while statement can be replaced by least fixpoint (Kleene’s Thm.)*

* Concrete domain = = domain of all concrete behavior
* Abstract domain = = domain of all abstraction
* Abstraction relation =

= ‘’ means abstraction ‘a’ describe concrete behavior ‘c’

* Concretization =
* Abstraction =
* Galois connection = pair of concrete and abstraction

1. and are monotone function.

2. loses precision

3. gives more information

* Non-relational abstraction = abstraction with no info. about variable’s relationship

*ex. sign, interval, etc.*

* a