2. A Gentle Introduction to Static Analysis

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* reachability = Every possible program state must not be in given area
* abstraction = logical properties of program states
* abstract element = each logical property of abstraction
* abstract domain = set of abstract elements
* concretization = transform abstract elements into actual set of program states
* styles of abstraction =

\* Compositional Style

Use composition of all program states that occurs while program is running

\* Transitional Style

Use states while each program statement is treated as transition of states

* widening = making abstraction of loop, by applying two steps until stabilized

1. Keep abstract element which is still satisfying in next iteration

2. Drop all abstract element which is not satisfying in next iteration

* inclusion(stabilization) = concretization of next step is subset of previous step
* loop unrolling = execute loop few times to get more abstract elements for precision
* Steps of Abstraction =

1. Select semantics and properties of interest

2. Choose the abstraction

3. Derive analysis algorithm