**Constant Propagation**

Computes that certain expressions are constants. For each variable maintains

* $\bot$(initial value)
* some constant value C
* the information that the value is not known to be constant

int a, b, step, i;

boolean c;

a = 0;

b = a + 10;

step = -1;

if (step > 0) {

i = a;

} else {

i = b;

}

c = true;

while (c) {

print(i);

i = i + step; // can emit decrement

if (step > 0) {

c = (i < b);

} else {

c = (i > a); // can emit better instruction here

// put here (a = a + step), redo analysis

}

}

Correctness of Constant Propagation

* concretization function
* comparison of N-th step of data-flow iteration and N-th step of state exploration