Other Types of Program Synthesis

- Counterexample-guided Inductive Synthesis
- Reactive synthesis
- Deductive Synthesis
Reactive Synthesis

Given a plant $P$ and a specification $\phi$, is there a controller $C$ such that the system $C \parallel P$ satisfies $\phi$?

Plant: 2-players game arena

Specification: game objective for Player 1

Controller: winning strategy for Player 1
There is a wealth of information on this topic out there ...
Deductive Synthesis

\[ \forall n \cdot 2^n = 2^{*n} \]

\[ \forall k, n \cdot k \cdot 2^n = k\llcorner\llcorner n \]

\[ \forall k, n :: k \cdot 4 + n = s4addl(k, n) \]

reg6 * 4 + 1

specification

\[ \text{synthesized program} \]
This is in the spirit of compilation but far more sophisticated ...
SKETCH