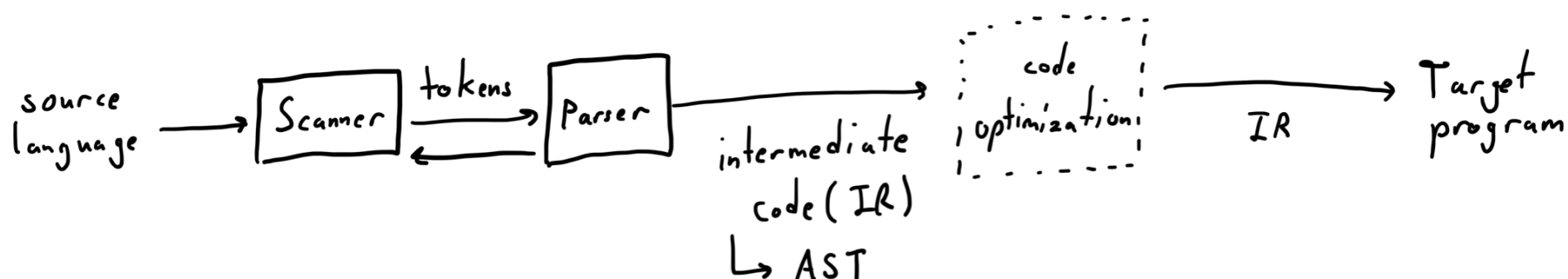


Code Optimization



1. Constant Folding

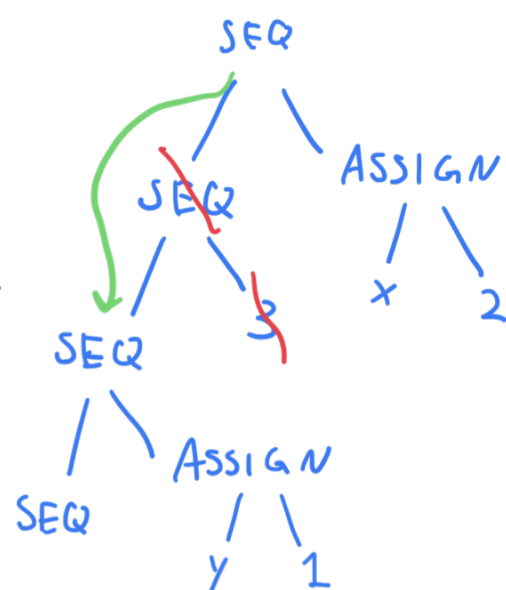
$$1 + 2 \Rightarrow 3$$

$$\text{"A"} + \text{"B"} \Rightarrow \text{"AB"}$$

2. Dead Code Elimination

~~3~~
~~if (0) then x else y~~
~~x = x~~

~~Uncalled functions~~



3. Algebraic Simplification

$$x + 0 \Rightarrow x$$

$$x * 1 \Rightarrow x$$

$$x * 0 \Rightarrow 0$$

4. Constant Propagation

$$x = 3$$

$$x + 4 \Rightarrow 7$$

5. Strength Reduction

$$x * 2 \Rightarrow x + x$$

$$x * 8 \Rightarrow x \ll 3$$

6. Loop-invariant Code Motion

$\text{for } (\dots) \{$
 $\quad y = a + b$
 $\}$

7. Boolean Simplification

$$x \&\& 1 \rightarrow x$$

$$x \&\& 0 \rightarrow 0$$

$$x \parallel 0 \rightarrow x$$

$$x \parallel 1 \rightarrow 1$$

$$(x < y) \&\& (x > y) \rightarrow 0$$

8. Multi-threading

9. In-lining

- Moving function code into main body of a program.

10. Sequence Flattening

