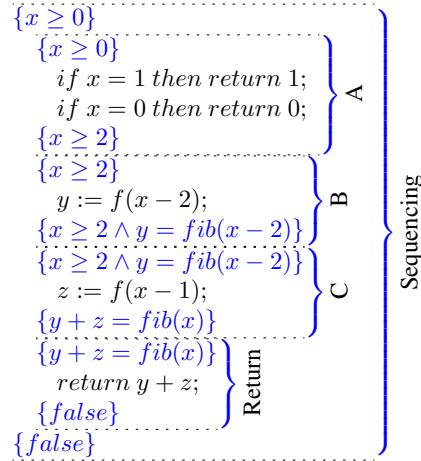


3 Functions

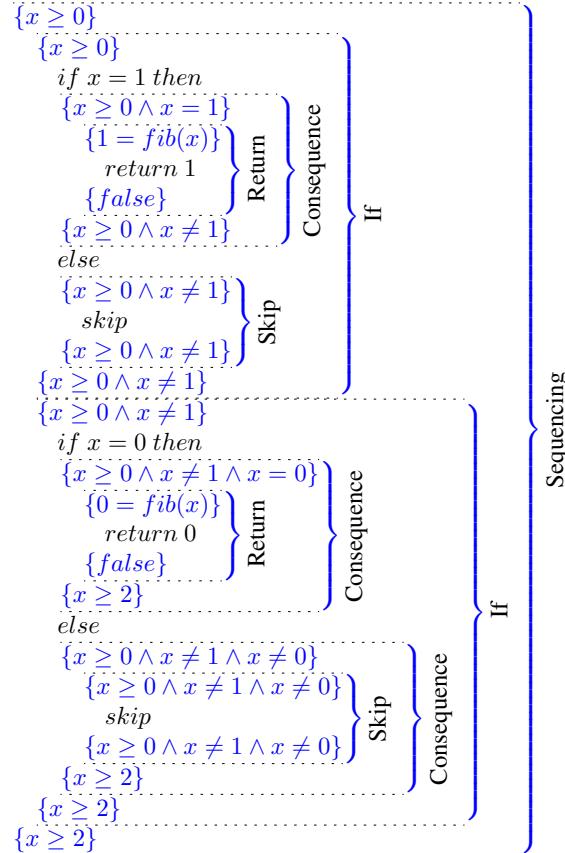
We will use the context

$$\{return = fib(x)\}return$$

and must verify the body. We can proceed as follows



We are left with three proofs A, B and C. The first is



The second, B, is

$$\begin{array}{l}
 \{x \geq 2\} \\
 \{\exists X. X \geq 0 \wedge X = x - 2 \wedge X = x - 2 \wedge x \geq 2\} \\
 \{X \geq 0 \wedge X = x - 2 \wedge X = x - 2 \wedge x \geq 2\} \\
 \{X \geq 0 \wedge X = x - 2\} \\
 y := f(x - 2); \\
 \{y = fib(X)\} \\
 \{y = fib(X) \wedge X = x - 2 \wedge x \geq 2\} \\
 \{\exists X. y = fib(X) \wedge X = x - 2 \wedge x \geq 2\} \\
 \{x \geq 2 \wedge y = fib(x - 2)\}
 \end{array}$$

Invariance Logical Var Consequence

The third, B, is

$$\begin{array}{l}
 \{x \geq 2 \wedge y = fib(x - 2)\} \\
 \{\exists X. X \geq 0 \wedge X = x - 1 \wedge X = x - 1 \wedge y = fib(x - 2)\} \\
 \{X \geq 0 \wedge X = x - 1 \wedge X = x - 1 \wedge y = fib(x - 2)\} \\
 \{X \geq 0 \wedge X = x - 1\} \\
 z := f(x - 1); \\
 \{z = fib(X)\} \\
 \{z = fib(X) \wedge X = x - 1 \wedge y = fib(x - 2)\} \\
 \{\exists X. y = fib(X) \wedge X = x - 1 \wedge y = fib(x - 2)\} \\
 \{y + z = fib(x)\}
 \end{array}$$

Invariance Logical Var Consequence