$\{P\} \equiv \{ n \geq 0 \}$

$\{P'\} \equiv \{ 2 = 2 \} \equiv \{ 2 = 2^{n-n+1} \}$ — $\{P\} \Rightarrow \{P'\}$ *Kosequenzregel*

p = n

$\{R1\} \equiv \{ 2 = 2^{n-p+1} \} \equiv \{ 2 = 2^{n-p+1} \wedge True \} \equiv \{ 2 = 2^{n-p+1} \wedge (p \neq 0 \vee True) \} \equiv \{ 1+1 = 2^{n-p+1} \wedge (p \neq 0 \vee 1 = 1) \}$ — $\{P'\} \Rightarrow \{R1\}$ *Zuweisungsaxiom*

b = 1

$\{R2\} \equiv \{ b+1 = 2^{n-p+1} \wedge (p \neq 0 \vee b = 1) \}$ — $\{R1\} \Rightarrow \{R2\}$ *Zuweisungsaxiom*

r = 1

$\{INV\} \equiv \{ b+r = 2^{n-p+1} \wedge (p \neq 0 \vee b = r) \}$ — $\{R2\} \Rightarrow \{INV\}$ *Zuweisungsaxiom*

while p != 0:

$\{INV \wedge B\} \equiv \{ b+r = 2^{n-p+1} \wedge p \neq 0 \}$

if b == 0:

$\{INV \wedge B \wedge C\} \equiv \{I1\} \equiv \{ b+r = 2^{n-p+1} \wedge p \neq 0 \wedge b = 0 \} \equiv \{ r = 2^{n-p+1} \wedge p \neq 0 \wedge b = 0 \}$ — $\{I1\} \Rightarrow \{I1'\}$ *Kosequenzregel*

$\{I1'\} \equiv \{ r = 2^{n-p+1} \}$ — $\{I1'\} \Rightarrow \{S1\}$ *Zuweisungsaxiom*

p = p-1

$\{S1\} \equiv \{ r+r = 2^{n-p+1} \wedge p \neq 0 \} \equiv \{ r = 2^{n-p} \wedge p \neq 0 \}$ — $\{S1\} \Rightarrow \{INV'\}$ *Zuweisungsaxiom*

b = r

$\{INV'\} \equiv \{ b+r = 2^{n-p+1} \wedge p \neq 0 \}$

else:

$\{INV \wedge B \wedge \neg C\} \equiv \{I2\} \equiv \{ b+r = 2^{n-p+1} \wedge p \neq 0 \wedge b \neq 0 \}$ — $\{I2\} \Rightarrow \{I2'\}$ *Kosequenzregel*

$\{I2'\} \equiv \{ b+r = 2^{n-p+1} \wedge p \neq 0 \} \equiv \{ b-1+r+1 = 2^{n-p+1} \wedge p \neq 0 \}$ — $\{I2'\} \Rightarrow \{S2\}$ *Zuweisungsaxiom*

r = r+1

$\{S2\} \equiv \{ b-1+r = 2^{n-p+1} \wedge p \neq 0 \}$ — $\{S2\} \Rightarrow \{INV'\}$ *Zuweisungsaxiom*

b = b-1

$\{INV'\} \equiv \{ b+r = 2^{n-p+1} \wedge p \neq 0 \}$

$\{INV'\} \equiv \{ b+r = 2^{n-p+1} \wedge p \neq 0 \}$

Bedingungsregel:
$\{INV \wedge B\} / \{INV \wedge B\} \Rightarrow \{INV'\}$

$\{INV\} \equiv \{ b+r = 2^{n-p+1} \wedge (p \neq 0 \vee b = r) \}$ — $\{INV'\} \Rightarrow \{INV\}$ *Kosequenzregel*

$\{INV \wedge \neg B\} \equiv \{ b+r = 2^{n-p+1} \wedge (p \neq 0 \vee b = r) \wedge p = 0 \}$

While-Regel:
$\{INV\} \Rightarrow \{INV \wedge \neg B\}$

$\{Q'\} \equiv \{ b+r = 2^{n-p+1} \wedge b = r \wedge p = 0 \}$

$\{INV \wedge \neg B\} \equiv \{Q''\}$

$\{Q\} \equiv \{ r = 2^n \} \equiv \{ 2r = 2^{n+1} \}$ — $\{Q'\} \Rightarrow \{Q\}$ *Kosequenzregel*

return r

Sequenzregeln:
$\{P\} \Rightarrow \{Q\}$