$\begin{array}{l} \lceil B \\ \text{if } t_3 = 0 \text{ goto } \boxed{} \\ S \\ \text{goto } \boxed{} \end{array} \Rightarrow$

$t1 = 0$
$t3 : 0 - y$
$\text{if } t3 < 0 \text{ goto } \boxed{\cdot}$
$t2 = 0$
$\text{goto } \boxed{}$
$t2 = 1 \leftarrow - -$

$\text{if } t2 = 0 \text{ goto } \boxed{\cdot}$
$t4 = 1$
$t5 = x - t4$
$x = t5$

A_{while} □ $t4 = 1$
$x := t_a$ $t5 = x - t4$
$x = t5$

S_{while}

$(t_a, A) = (t5, \cdot)$

A_1
$A_2 t1 = 0$
$t3 = 0 - x$
$\text{if } t3 < 0 \text{ goto } \boxed{}$ $(t3,)$
$t2 = 0$
$\text{goto } \boxed{}$
$t2 = 1 \leftarrow - -$

$A_1 = \emptyset$
$A_2 = t1 = 0$
$t_a = t1$
$t_b = x$
$t = t2$

b_{ROP}

a_{NUM}
$(t1, t1 = 0)$

NUB

$S_{assignment}$

ID

$(t_a, A) = (t5,)$

$t4 = 1$
$t5 = x - t4$
$(t_1, A_1) = (x, \emptyset)$
$(t_2, A_2) = (t4, t4 = 1)$
$t = t5$

a_{AOP}

a_{ID}
$(x, \emptyset)$

a_{Num}
$(t4, t4 = 1)$

a_{ID}
$(x, \emptyset)$

ID

a_{Num}

Num

while   x   >   0   do   x := x   -1
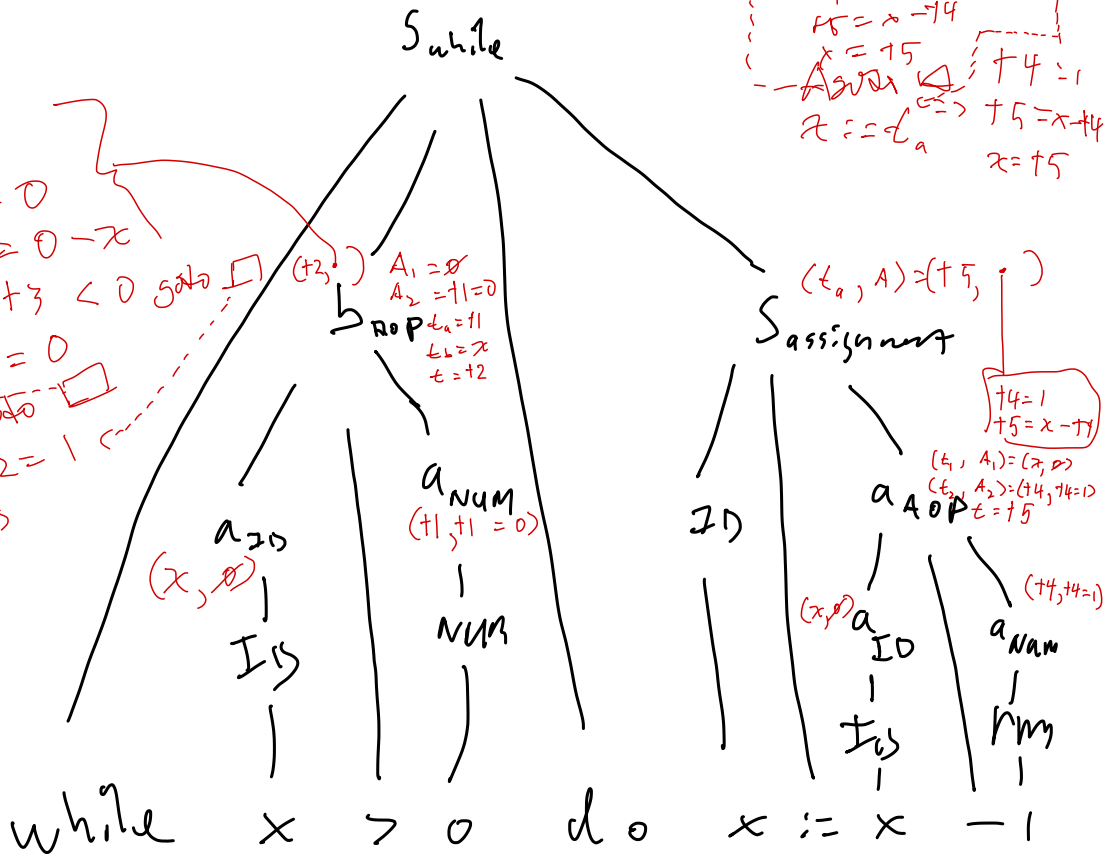
$A_1 \to \emptyset$

$A_2 \to t1 := 0$

$t_1 \to x$

$t_2 \to t1$ t_a t_b v_{true} v_{false}

$Gen\,Rel\,(t1, x, 1, 0)$

B

$if\,goto\ t_b = 0$ Pend

S

$goto$ Pend

Pend:

$t1 := 0$

$t3 := t1 - x$

$if\ t3 < 0\ goto\ \square$

$t2 := 0$

$goto\ \square$

$t2 := 1$

S_{while}

$(t3,)$ b_{ROP}

a $(x, \emptyset)$ d $(t1, t1 := 0)$

ID Num

A
$x := \epsilon$ $t4 := 1$
$t5 := x - t4$
$x := t5$ A_1
A_2
$t = t_a\,or\,t_b$

S_{Assign}

$t4 := 1$
$t5 := x - t4$
$(t5, b)$

ID

$(x, \emptyset)\,ID$ a_{op} $Num\ (t4,$ $t4 := 1)$

while   x > 0   do   x := x - 1