

# t49\_stacks\_1 (TMayHjSmx- hZh2oCTMGUrWv1ZK7wvVJe5bcm)

October 27, 2020

Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v11\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v2\_stacks\_1 : \iota \Rightarrow o$  be given. Let  $v3\_stacks\_1 : \iota \Rightarrow o$  be given. Let  $v4\_stacks\_1 : \iota \Rightarrow o$  be given. Let  $v5\_stacks\_1 : \iota \Rightarrow o$  be given. Let  $v6\_stacks\_1 : \iota \Rightarrow o$  be given. Let  $v7\_stacks\_1 : \iota \Rightarrow o$  be given. Let  $l1\_stacks\_1 : \iota \Rightarrow o$  be given. Let  $r4\_stacks\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k8\_stacks\_1 : \iota \Rightarrow \iota$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k9\_stacks\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r3\_stacks\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k6\_partfun1 : \iota \Rightarrow \iota$  be given. Let  $k4\_relat\_1 : \iota \Rightarrow \iota$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $v1\_stacks\_1 : \iota \Rightarrow o$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l5\_struct\_0 : \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_stacks\_1 \\ & X0) \wedge ((v3\_stacks\_1 X0) \wedge ((v4\_stacks\_1 X0) \wedge ((v5\_stacks\_1 X0) \wedge \\ & ((v6\_stacks\_1 X0) \wedge ((v7\_stacks\_1 X0) \wedge (l1\_stacks\_1 X0)))))))))) \Rightarrow \\ & (\exists X1. ((v1\_relat\_1 X1) \wedge (v1\_funct\_1 X1)) \wedge ((\forall X2. \\ & (m1\_subset\_1 X2 (u4\_struct\_0 X0)) \Rightarrow (k1\_funct\_1 X1 X2 = k9\_stacks\_1 \\ & X0 X2)) \wedge (r3\_stacks\_1 X0 (k8\_stacks\_1 (u1\_struct\_0 X0)) (k6\_partfun1 \\ & (u1\_struct\_0 X0) X1)))) \end{aligned} \tag{1}$$

Assume the following.

$$\forall X0. k6\_partfun1 X0 = k4\_relat\_1 X0 \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0. (\neg v1\_xboole\_0 X0) \Rightarrow ((\neg v2\_struct\_0 (k8\_stacks\_1 X0)) \wedge \\ & ((\neg v11\_struct\_0 (k8\_stacks\_1 X0)) \wedge ((v1\_stacks\_1 (k8\_stacks\_1 \\ & X0)) \wedge (v6\_stacks\_1 (k8\_stacks\_1 X0)))))) \end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned} & \forall X0. (\neg v1\_xboole\_0 X0) \Rightarrow ((\neg v2\_struct\_0 (k8\_stacks\_1 X0)) \wedge \\ & ((\neg v11\_struct\_0 (k8\_stacks\_1 X0)) \wedge ((v1\_stacks\_1 (k8\_stacks\_1 \\ & X0)) \wedge (v5\_stacks\_1 (k8\_stacks\_1 X0)))))) \end{aligned} \tag{4}$$

Assume the following.

$$\forall X0.(\neg v1\_xboole\_0 X0) \Rightarrow ((\neg v2\_struct\_0 (k8\_stacks\_1 X0)) \wedge ((\neg v11\_struct\_0 (k8\_stacks\_1 X0)) \wedge ((v1\_stacks\_1 (k8\_stacks\_1 X0)) \wedge (v4\_stacks\_1 (k8\_stacks\_1 X0)))))) \quad (5)$$

Assume the following.

$$\forall X0.(\neg v1\_xboole\_0 X0) \Rightarrow ((\neg v2\_struct\_0 (k8\_stacks\_1 X0)) \wedge ((\neg v11\_struct\_0 (k8\_stacks\_1 X0)) \wedge ((v1\_stacks\_1 (k8\_stacks\_1 X0)) \wedge (v3\_stacks\_1 (k8\_stacks\_1 X0)))))) \quad (6)$$

Assume the following.

$$\forall X0.(\neg v1\_xboole\_0 X0) \Rightarrow ((\neg v2\_struct\_0 (k8\_stacks\_1 X0)) \wedge ((\neg v11\_struct\_0 (k8\_stacks\_1 X0)) \wedge ((v1\_stacks\_1 (k8\_stacks\_1 X0)) \wedge (v2\_stacks\_1 (k8\_stacks\_1 X0)))))) \quad (7)$$

Assume the following.

$$\forall X0.(v1\_relat\_1 (k4\_relat\_1 X0)) \wedge (v1\_funct\_1 (k4\_relat\_1 X0)) \quad (8)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0) \wedge (l1\_struct\_0 X0)) \Rightarrow (\neg v1\_xboole\_0 (u1\_struct\_0 X0)) \quad (9)$$

Assume the following.

$$\forall X0.(l5\_struct\_0 X0) \Rightarrow (l1\_struct\_0 X0) \quad (10)$$

Assume the following.

$$\forall X0.(l1\_stacks\_1 X0) \Rightarrow (l5\_struct\_0 X0) \quad (11)$$

Assume the following.

$$\forall X0.(\neg v1\_xboole\_0 X0) \Rightarrow ((\neg v2\_struct\_0 (k8\_stacks\_1 X0)) \wedge ((\neg v11\_struct\_0 (k8\_stacks\_1 X0)) \wedge ((v1\_stacks\_1 (k8\_stacks\_1 X0)) \wedge (l1\_stacks\_1 (k8\_stacks\_1 X0)))))) \quad (12)$$

Assume the following.

$$\forall X0.v1\_relat\_1 (k4\_relat\_1 X0) \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_stacks\_1 X0) \wedge ((v3\_stacks\_1 X0) \wedge ((v4\_stacks\_1 X0) \wedge ((v5\_stacks\_1 X0) \wedge ((v6\_stacks\_1 X0) \wedge (l1\_stacks\_1 X0)))))))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((\neg v11\_struct\_0 X1) \wedge ((v2\_stacks\_1 X1) \wedge ((v3\_stacks\_1 X1) \wedge ((v4\_stacks\_1 X1) \wedge ((v5\_stacks\_1 X1) \wedge ((v6\_stacks\_1 X1) \wedge (l1\_stacks\_1 X1)))))))) \Rightarrow ((r4\_stacks\_1 X0 X1) \Leftrightarrow (\exists X2.((v1\_relat\_1 X2) \wedge (v1\_funct\_1 X2)) \wedge (\exists X3.((v1\_relat\_1 X3) \wedge (v1\_funct\_1 X3)) \wedge (r3\_stacks\_1 X0 X1 X2 X3)))))) \quad (14) \end{aligned}$$

**Theorem 1**

$$\begin{aligned} \forall X0. (&(\neg v2\_struct\_0 X0) \wedge (\neg v11\_struct\_0 X0) \wedge ((v2\_stacks\_1 \\ &X0) \wedge ((v3\_stacks\_1 X0) \wedge ((v4\_stacks\_1 X0) \wedge ((v5\_stacks\_1 X0) \wedge \\ &((v6\_stacks\_1 X0) \wedge ((v7\_stacks\_1 X0) \wedge (l1\_stacks\_1 X0))))))) \Rightarrow \\ &(r4\_stacks\_1 X0 (k8\_stacks\_1 (u1\_struct\_0 X0))) \end{aligned}$$