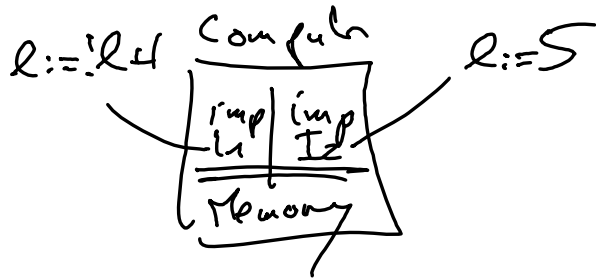


COMP 3610/6361

05/14/2023

$(l := 3) \parallel (l := 5 \parallel m := 7)$

$(l := 3) \parallel \text{while}(\text{true}) \text{ do } m := !m + 1$



$$(R_1 || R_2 || memory) || R_3$$

$\langle l := 1 \parallel l := 2, \{l \mapsto 0\} \rangle$

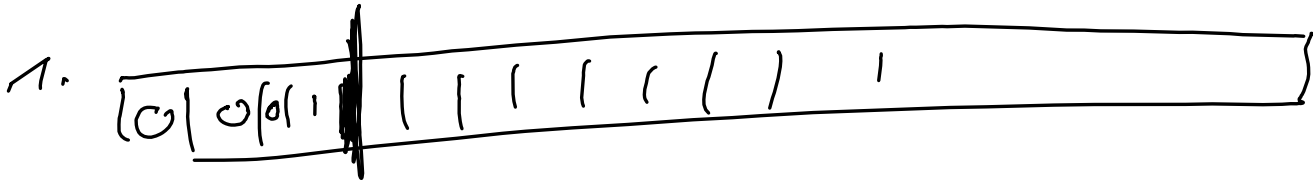
\swarrow
 $\langle l := 1 \parallel \text{skip}, \{l \mapsto 2\} \rangle$

\downarrow
 $\langle \text{skip} \parallel \text{skip}, \{l \mapsto 1\} \rangle$

\searrow $\langle \text{skip} \parallel l := 2, \{l \mapsto 1\} \rangle$

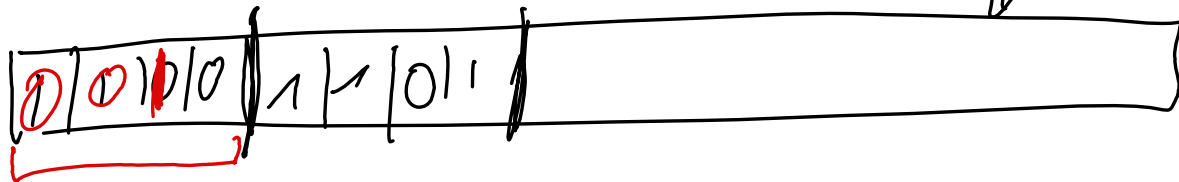
\downarrow
 $\langle \text{skip} \parallel \text{skip}, \{l \mapsto 2\} \rangle$

Hardware



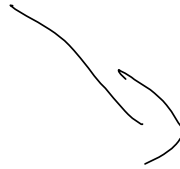
$l := N$

process writes
↓
here



$l := 2$

$\langle e := 1 + !e \parallel e := 7 + !e, \{e \mapsto 0\} \rangle$



$\langle \text{skip} \parallel \text{skip}, \{e \mapsto 0\} \rangle$

Adapt big step semantics / denotational sem.

com store store com store set of store

$$\langle c, s \rangle \Downarrow s' \quad \longrightarrow \quad \langle c, s \rangle \Downarrow \{s'\}$$

\uparrow
 set of possible outcomes

$$\frac{\langle c_1, s \rangle \Downarrow s' \quad \langle c_2, s' \rangle \Downarrow s''}{\langle c_1; c_2, s \rangle \Downarrow s''}$$

$$\frac{\langle c_1, s \rangle \Downarrow s' \quad \langle c_2, s_i' \rangle \Downarrow s_i'}{\langle c_1; c_2, s \rangle \Downarrow \bigcup_i s_i'}$$

$\forall s_i' \in S'$
 $s_i' \subseteq S'$
 \bigcup_i "set"