

Exercise: Worker, Hammer, Nail

$$\text{Worker} \parallel \text{Hammer} \parallel \text{Nail} = \langle L, L_0, \text{Act}_{\parallel H}, C, T_{\parallel H}, \text{Inv}_{\parallel H} \rangle$$

$$L = L_1 \times L_2 \times L_3 = \{ (rest, free, up), (rest, free, half), \\ (rest, free, done), (rest, busy, up), \\ (rest, busy, half), (rest, busy, done), \\ (work, free, up), (work, free, half), \\ (work, free, done), (work, busy, up), \\ (work, busy, half), (work, busy, done) \}$$

$$L_0 = L_{01} \times L_{02} \times L_{03} = \{ (rest, free, up) \}$$

$$\text{Act}_{\parallel H} = \{ ((\text{Act}_1 \cup \text{Act}_2) - H_1) \cup \text{Act}_3 - H_2 \} \cup \{ \tau \} \\ \{ done, go, hit \} - \{ done, go \} \cup \{ hit, - \} - \{ hit \} \cup \{ \tau \} \\ = \{ \tau, - \}$$

$$C = C_1 \cup C_2 \cup C_3 = \{z, x, y\}$$

$$I_{mv} \parallel_H \langle l_1, l_2, l_3 \rangle = \begin{cases} z \leq 60 & \text{se } l_1 = \text{work} \\ 0 & \text{se caso contrário} \end{cases}$$

$$Tr \parallel_H = \left\{ \begin{array}{l} (\langle \text{rest}, \text{free}, \text{up} \rangle \xrightarrow{\tau, T, \{z, x, y\}} \langle \text{work}, \text{busy}, \text{up} \rangle), \\ (\langle \text{work}, \text{busy}, \text{up} \rangle \xrightarrow{z \geq 10 \wedge y \geq 5, T, \emptyset} \langle \text{rest}, \text{free}, \text{up} \rangle), \\ (\langle \text{work}, \text{busy}, \text{up} \rangle \xrightarrow{x \geq 1, T, \{x\}} \langle \text{work}, \text{busy}, \text{half} \rangle), \\ (\langle \text{work}, \text{busy}, \text{half} \rangle \xrightarrow{x \geq 1, T, \{x\}} \langle \text{work}, \text{busy}, \text{done} \rangle), \\ (\langle \text{work}, \text{busy}, \text{half} \rangle \xrightarrow{z \geq 10 \wedge y \geq 5, T, \emptyset} \langle \text{rest}, \text{free}, \text{half} \rangle), \\ (\langle \text{work}, \text{busy}, \text{done} \rangle \xrightarrow{\tau, -1, \emptyset} \langle \text{work}, \text{busy}, \text{up} \rangle), \\ (\langle \text{work}, \text{busy}, \text{done} \rangle \xrightarrow{z \geq 10 \wedge y \geq 5, T, \emptyset} \langle \text{rest}, \text{free}, \text{done} \rangle), \\ (\langle \text{rest}, \text{free}, \text{half} \rangle \xrightarrow{\tau, T, \{z, x, y\}} \langle \text{work}, \text{busy}, \text{half} \rangle), \\ (\langle \text{rest}, \text{free}, \text{done} \rangle \xrightarrow{\tau, -1, \emptyset} \langle \text{rest}, \text{free}, \text{up} \rangle) \end{array} \right\}$$

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