

# Cyber Physical Systems - Discrete Models

## Exercise Sheet 4 Solution

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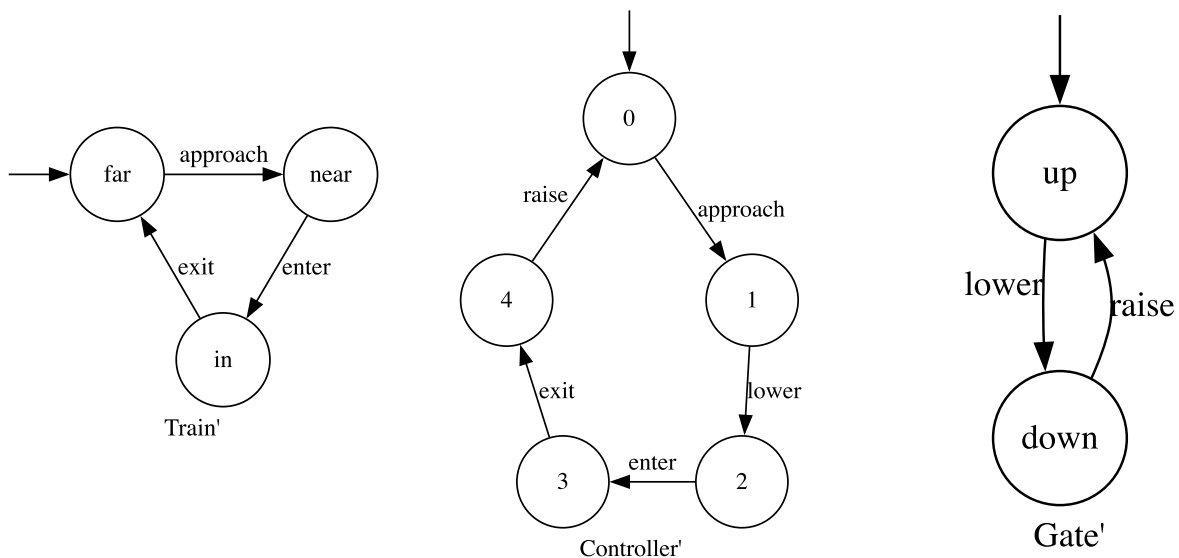
November 12, 2023

### Exercise 1: Railroad Crossing

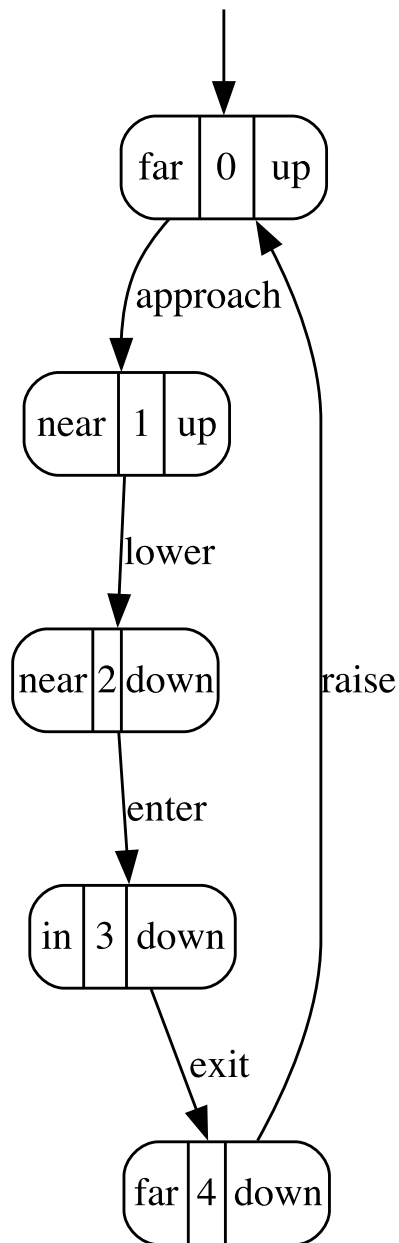
**A**

Because train's *enter* action and gate's *lower* action are not synchronized, the model allows to train to enter before the gate is lowered.

**B**

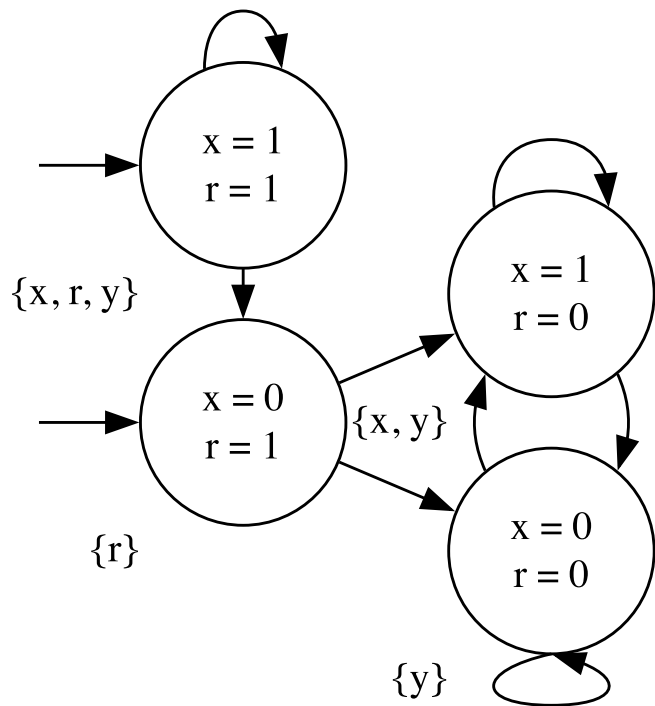


**C**



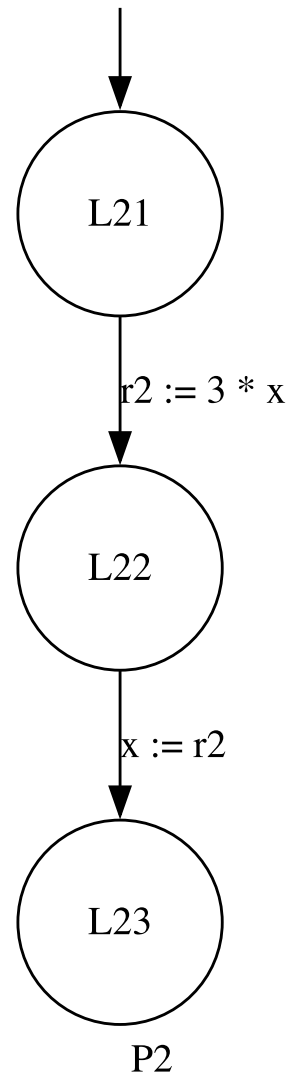
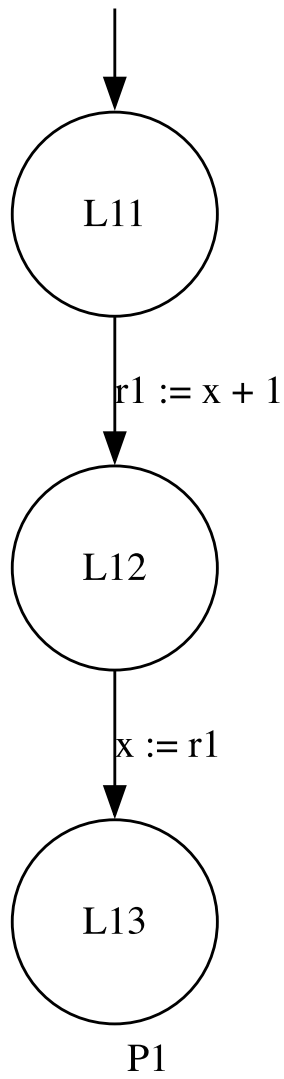
Train' || Controller' || Gate'

## Exercise 2: Hardware Circuit and Transition System

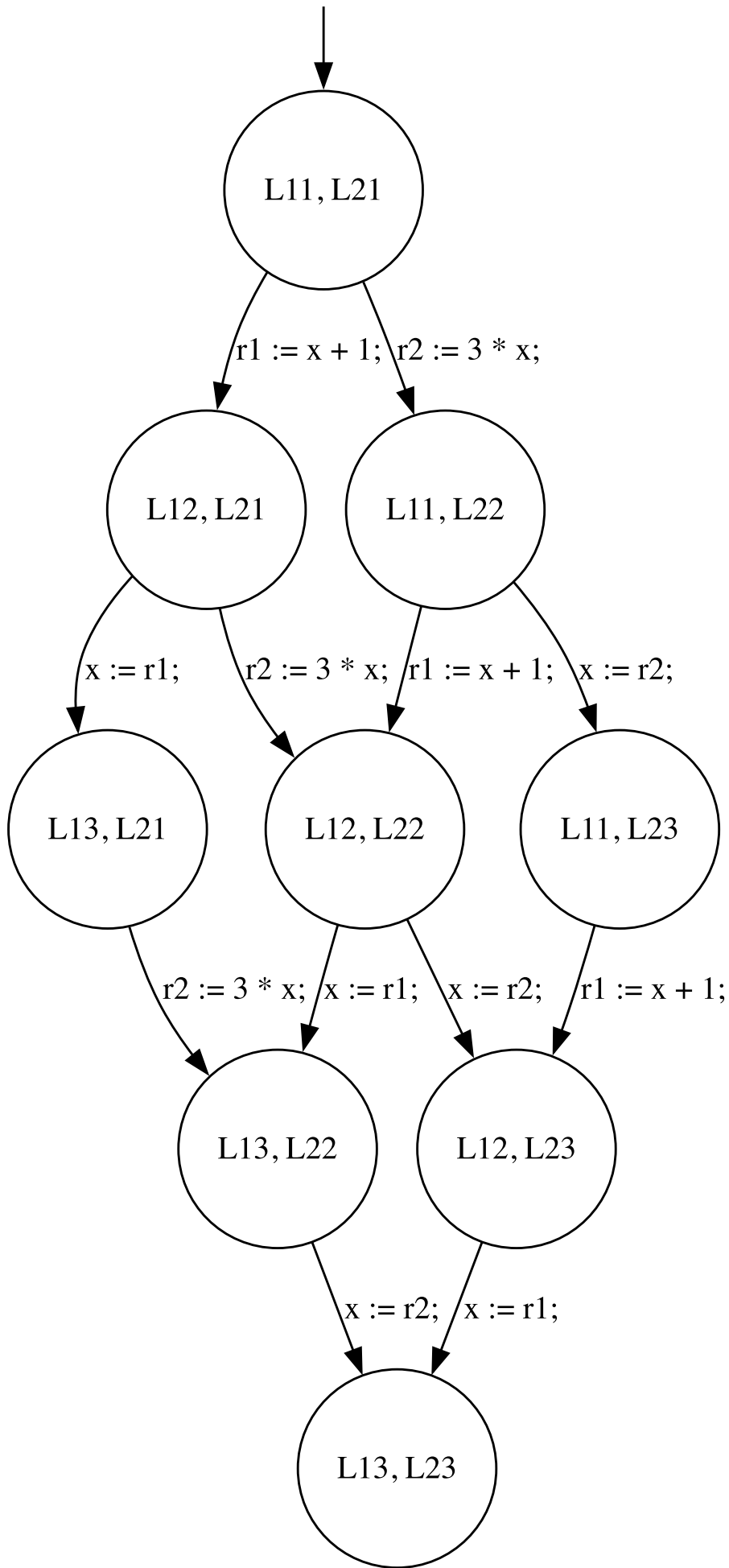


## Exercise 3: Paralellism - Interleaving

### Part A

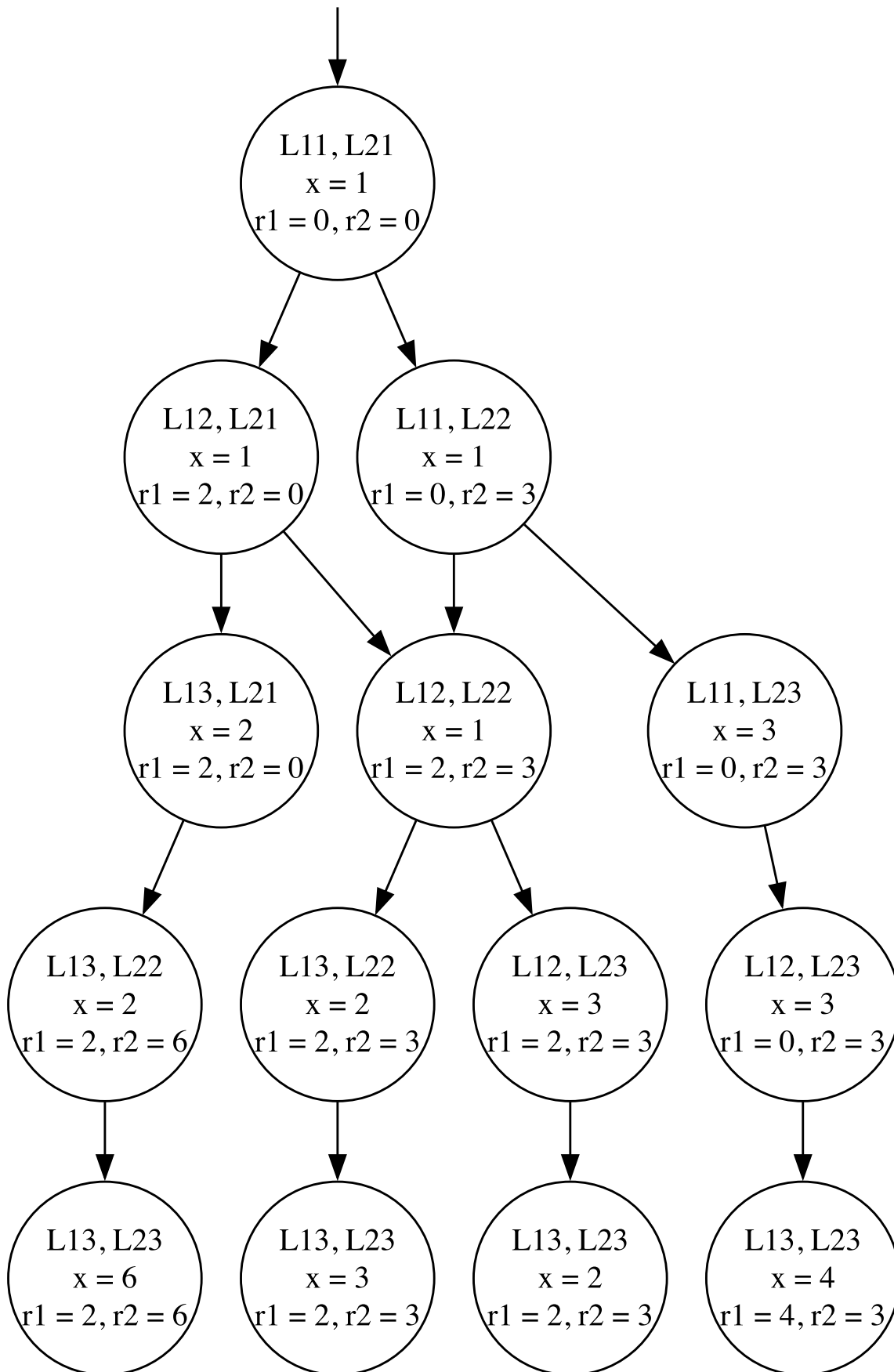


**Part B**



P1  $\equiv$  P2

## Part C



T(P1 ||| P2)