02158 CONCURRENT PROGRAMMING FALL 2024

Exercise Class 1

Thursday Sep 5

Petri Nets

- 1. Solve Petri.2 (on page 1 of Auxiliary Exercises [Aux]).
- **2.** Is it possible to construct a Petri Net which allows the same sequences of actions, but without any concurrency?
- 3. Solve Petri.1.

You are encouraged to develop the Petri Net incrementally. Start by ignoring the jetty capacities and the shuttle routes. Then add these aspects one at a time.

- 4. Discuss some advantages/disadvantages of using a formal model like Petri Nets to describe activities compared to using natural language.
- 5. In a directed graph, a *fork* is a node with one incoming and two (or more) outgoing arrows.Draw the two kinds of forks that may occur in a Petri Net.What do these two kinds of forks model?
- 6. Do Petri.4 (you may consult [Basic 1] to see the mathematical representation of Petri Nets).

For the concrete form of the simultaneous firings asked for in the last question, one such would be written

 $M_0 \xrightarrow{\{t_1, t_2\}} (0, 2, 1)$