

Parallel Programming WS 2014/2015 - Solution 4

Kastens, Pfahler

Institut für Informatik, Fakultät für Elektrotechnik, Informatik und Mathematik, Universität Paderborn

Dec 08, 2014

Solution for Exercise 1

a) The monitor invariant:

```
// to be enforced by waiting
seats >= seated >= transported

// guaranteed by execution order
seats >= transported
```

b) The necessary waiting conditions and counter increments:

Entry Procedure	wait while ...	Modify counters
ride	seats <= seated	seated++;
offer		seats += 8;
	seated < transported + 8;	transported += 8;

c)

To substitute the increasing counters by limited counters, we define two new counters:

```
freeseats = seats - seated
entered = seated - transported
```

The counter actions and waiting conditions are transformed to:

Entry Procedure	wait while ...	Modify counters
ride	freeseats <= 0	freeseats--; entered++;
offer		freeseats = 8;
	entered < 8;	entered = 0;

d)

LAB: A Java monitor that can be used with the FAShuttle simulation is provided in directory `blatt4/FAShuttle.sol`.

Solution for Exercise 2

Directory `blatt4/dices.sol` contains an implementation of the complete dice simulation.