5.7 The roller coaster problem

This problem is from Andrews's *Concurrent Programming* [1], but he attributes it to J. S. Herman's Master's thesis.

> Suppose there are n passenger threads and a car thread. The passengers repeatedly wait to take rides in the car, which can hold C passengers, where $C < n$. The car can go around the tracks only when it is full.

Here are some additional details:

- Passengers should invoke `board` and `unboard`.
- The car should invoke `load`, `run` and `unload`.
- Passengers cannot board until the car has invoked `load`
- The car cannot depart until C passengers have boarded.
- Passengers cannot unboard until the car has invoked `unload`.

Puzzle: Write code for the passengers and car that enforces these constraints.