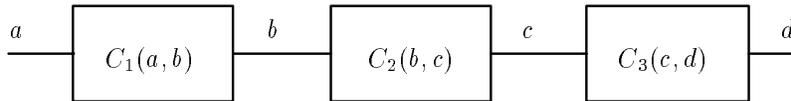# Take-home assignment 1

1. Imagine a line of cars driving on a highway where each car $C(b, f)$ has a channel f to the car before it and a channel b to the car behind it. For the purpose of this exercise we can consider the line to be infinite (so we ignore any boundary problems) and static (no cars enter or leave the line). Pictorially:

    The problem is to define $C(b, f)$ so that a car may overtake another car. Beware of deadlocks, or of cars overtaking a car which itself is in the process of overtaking a third car. (Don't embark on any complicated construction here—this is mainly a warming up exercise which only requires a couple of lines.)

2. The lambda-calculus encodings in the π-calculus usually demonstrate the lazy reduction strategy. Another strategy is *call-by-value*, its encoding is only slightly more complex and you will find it in Milner's article *Functions as Processes*, or in Sangiorgi's thesis. Represent this encoding in interaction diagrams, and demonstrate a few typical reductions.