# Assignments Boolean Networks

## Question 1

Imagine using a Boolean Network to model the process of steering a car on the road. How could you set up the rules and what might be problems with the behavior relative to how a real driver steers a car?

## Question 2

In BooleSim generate a model for a biological oscillator based on three genes and the transcription factors these genes encode. Gene *Ga*, when active, is transcribed and leads to the production of repressor *Rb*, which represses the transcription of gene *Gb*. Expression of *Gb* in turn generates a repressor *Rc*, which represses gene Gc, that makes a repressor *Ra* for gene *Ga*. Initially you can make the assumption that all the repressor molecules get degraded as soon as the transcription of the corresponding gene gets turned off.

a) What is the behavior of your network?

b) Now try to adapt your model to represent the fact that the repressor molecules, once they have been generated, stay around.

c) Include in your model a protease P that is constitutively active and degrades the repressors. What is the behavior of the network now?

d) If you were to design such a network inside a living cell do you think it will reproduce the behavior seen in the model? Why?