## Tutorials for Cyber-Physical Systems I - Model Checking
Exercise sheet 2

Exercise 1: Traffic lights

Consider the traffic junction depicted on the left in the following figure. On the right, a traffic light is outlined by a partially defined transition system. For only two traffic lights, A_1 and A_2 could be synchronized with their counterpart and thus can simply be modeled by a single traffic light.
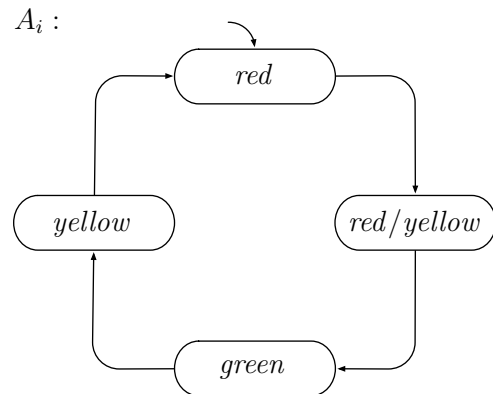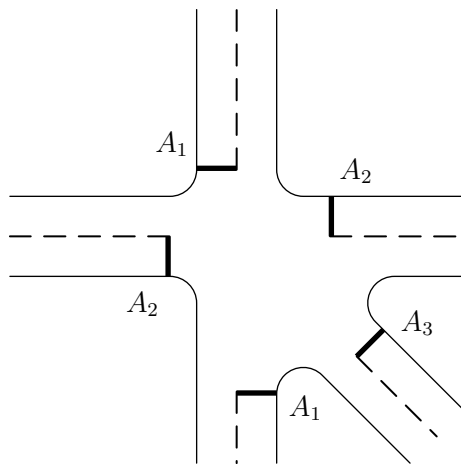
(a) Choose appropriate actions and label the transitions of each A_i accordingly.

(b) Specify a reasonable controller C in terms of a transition system that switches the green signal in the order $A_1, A_2, A_3, A_1, A_2, A_3, \ldots$ (Hint: Choose an appropriate communication mechanism). How many actions does each traffic light require to guarantee safety?

(c) Outline the transition system $A_1 \parallel A_2 \parallel A_3 \parallel C$.