6. Exercise sheet: Petri nets

Exercise 1
Model a traffic light by a Petri-Net.

(1) You can use any number of places, however only multiplicity 1 is allowed.

(2) Now only 3 places (one for each color) may be used, but there are no restrictions on the multiplicities.

Exercise 2
Prove or give a counterexample: \( m[q]m' \leq m' = m + \Delta q \).

Exercise 3
(1) Model the following Handshaking protocol by a Petri-Net:
Two processes P1 and P2 mutually exchange messages. P1 is the sender and P2 the receiver. P1 starts in state Ready-to-Send. When it has sent a message to P2, it moves into the state Ready-to-Receive and waits for an acknowledgement ACK sent by P2. Once the acknowledgement has been arrived, P1 can send more messages. P2 starts in state Waiting-for-Messages. If it receives a message, it confirms by sending an acknowledgement ACK to P1 and waits for more messages.

(2) Give the reachability tree.