Assignment 1
Lustre and SCADE programming

In each of the following exercise, please construct Lustre code and simulate it using Luciole tool. Please submit pictures of timing diagrams for enough input test cases to illustrate all aspects of the behaviour.

1. Program a controller for CAR Headligthts.
   There are two inputs, one called ON and another called MODE and two outputs called LIGHT and HI.

   MODE can take values NORMAL, FLASHING or HIGH.
   If ON is true headlight is lighted.
   If MODE is NORMAL the beam is low.
   If MODE is FLASHING, the beam is KEPT HIGH for next 10 cycles.
   If MODE is HIGH then beam is HI.

2. Design and program a traffic light controller at a 4 way cross road of Main road and Side road. There are sensors on each road which detect whether car is waiting there. (Assume only one lane in each direction.) Use your own imagination to decide the behaviour.

3. Program in Lustre a master slave J-K Flip Flop (with clock) as node with boolean inputs J, K and clock. See http://www.electronics-tutorials.ws/sequential/seq_2.html

   Use this JK Flip flop node to program a modulo 12 counter by modifying the circuit given in link below. (see synchronous 4 bit counter in http://www.electronics-tutorials.ws/counter/count_3.html)