

TD 1

Exercices de Lustre

exercices classiques complètement inspirés des exercices de Verimag

EXERCISE #1 ▶ **Rising edge**

Write a specification of a rising edge detection and a lustre code.

EXERCISE #2 ▶ **History**

- Define a node that accumulates the values of its input;
- Define a node that returns the mean of the values of its input;
- Define a node that returns the maximum of the values of its input;
- Define a node that, given a constant input N, returns the mean of N successive values of its input, each N instant.

EXERCISE #3 ▶ **From chrono to Lustre**

Encode this behavior inside a Lustre node:

osc	true	true	false	true	false	true	...
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EXERCISE #4 ▶ **Fibonacci - a special case of double init**

Compute the fibonacci flow

EXERCISE #5 ▶ **Number of true occurrences**

Write a lustre node that counts the number of true occurrences of a given signal.

1.1 Finite state machines

Switches will help us to encode FSMs

EXERCISE #6 ▶ **Switches**

Write a node TwoStates receiving 3 Boolean inputs init, set, and reset, and behaving like a switch or a flip-flop:

- Its boolean output state
- is initially equal to init,
- is set to true when set is true,
- is reset to false when reset is true,
- keeps its previous value otherwise.