

### Shift Register Cédric Lauradoux

Let  $(s_n)_{n \geq 0}$  be the sequence generated by the LFSR from the Figure 1.

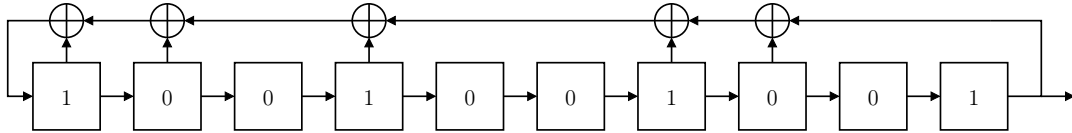


FIGURE 1. Linear Feedback Shift Register.

**Question.**

- (a) Determine the feedback polynomial.

Réponse: we have

$$s_{t+l} = \sum_{i=1}^{\ell} a_i s_{t+l-i}, \forall t \geq 0.$$

The generic representation of an LFSR is:

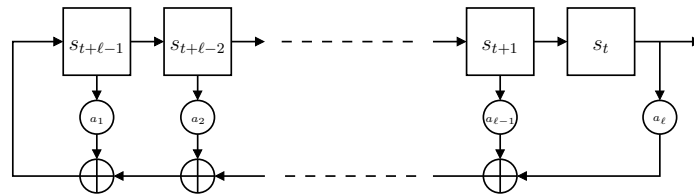


FIGURE 2. LFSR.

The feedback polynomial for Figure 1 is:

$$p(X) = X^{10} + X^8 + X^7 + X^4 + X^2 + X + 1.$$