**Goal:** Our goal was to design a Finite Impulse Response(FIR) filter , where, N(5) represents window length, x is the vector of input data, y is the vector of output data, and h is the vector of coefficients.

**Procedure**:

|  |  |
| --- | --- |
| Test | Test Scenario |
| FUNCTIONALITY TESTS | |
| 1 | 1) Write data\_in in internal coefficients buffer till it is full(5 clock cycles).  2) Read from data\_in when sample\_enable is high as samples and calculate the dot product |
| 2 | 1. Go to reset state from s\_coeff state 2. Go to reset state from s\_sample state |
| 3 | 1) coeff\_enable high for 10 clock cycles |
| 4 |  |
| 5 | 1.Update coefficients after beginning sampling  2. Do samplinging again after new set of coefficients are read |
| ERROR TESTS | |
| 1 | Coef\_enable becomes ‘zero’ before 5 clock cycles |
| 2 | Sample\_enable and coef\_enable both high in the same clock |
|  |  |
|  |  |

Figure 1: FSM and extended FSM of mealy machine of FIFO



