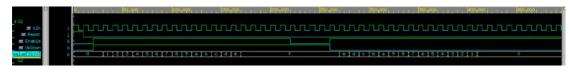
Problem 1

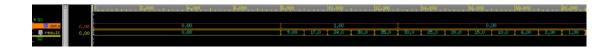
Waveform of the counter example



Problem 2

(Part 1) Console output and waveform

```
Info: (I702) default timescale unit used for tracing: 1 ps (waveform.vcd)
DATA: [ 1]=
             0.00000
                       0.00000
             0.00000
DATA: [2]=
                       0.00000
             0.00000
DATA: [ 3]=
                       0.00000
DATA: [ 4]=
             0.00000
                       0.00000
DATA: [ 5]=
             0.00000
                       0.00000
DATA: [ 6]=
             0.00000
                       0.00000
DATA: [ 7]=
             0.00000
                       0.00000
DATA: [ 8]=
             1.00000
                       9.00000
DATA: [ 9]=
             1.00000
                      17.00000
DATA: [10]=
             1.00000 24.00000
DATA: [11]=
             1.00000 30.00000
DATA: [12]=
             1.00000 35.00000
DATA: [13]=
             0.00000 30.00000
DATA: [14]=
             0.00000 25.00000
DATA: [15]=
             0.00000 20.00000
DATA: [16]=
             0.00000 15.00000
DATA: [17]=
             0.00000 10.00000
DATA: [18]=
             0.00000
                       6.00000
DATA: [19]=
             0.00000
                       3.00000
DATA: [20]=
             0.00000
                       1.00000
DATA: [21]=
             0.00000
                       0.00000
DATA: [22]=
             0.00000
                       0.00000
DATA: [23]= 0.00000
                       0.00000
INFO: Exiting fifo_fir simulation
INFO: Simulation fifo_fir PASSED with 0 errors
```

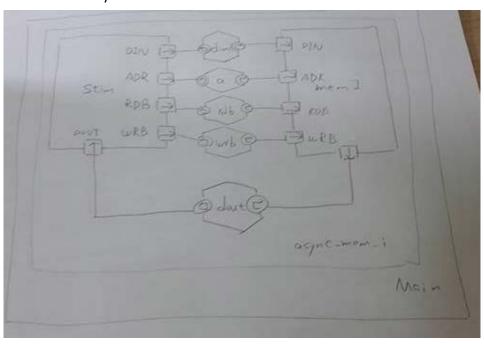


(Part 2) Console output and waveform

```
Info: (I702) default timescale unit used for tracing: 1 ps (wave.vcd)
DATA: [ 0]=
               0.00000
                         0.00000
DATA: [ 0]=
DATA: [ 1]=
DATA: [ 2]=
DATA: [ 3]=
               0.00000
                         0.00000
              0.00000
                         0.00000
               0.00000
                         0.00000
DATA: [ 4]=
               0.00000
                         0.00000
DATA: [ 5]=
               0.00000
                         0.00000
DATA: [ 6]=
               0.00000
                         0.00000
DATA: [7]=
               0.00000
                         0.00000
DATA: [ 8]=
               1.00000
                         9.00000
DATA: [ 9]=
               1.00000
                        17.00000
DATA: [10]=
              1.00000 24.00000
DATA: [11]=
              1.00000 30.00000
DATA: [12]=
              1.00000 35.00000
DATA: [13]=
              0.00000 30.00000
DATA: [14]=
              0.00000 25.00000
DATA: [15]=
              0.00000 20.00000
DATA: [16]=
DATA: [17]=
                        15.00000
              0.00000
              0.00000
                        10.00000
DATA: [18]=
              0.00000
                        6.00000
DATA: [19]=
              0.00000 3.00000
INFO: Exiting fifo fir simulation
INFO: Simulation fifo fir PASSED with O errors
```

Signal	Value at cursor	0	50000	100000		150000					200000				
clk					Л			Л		Л		Л			
data_in		0		1					0						
data_out		0		9	17	24	30	35	30	25	20	15	10	6	3
data_out orig_in reset		0		1					0						
reset															

Problem 3
Architecture for the system



(Part 3) Console output and waveform

```
Info: (I702) default timescale unit used for tracing: 1 ps (wave.vcd)
DATA: [0]=
              0.00000
                        0.00000
DATA: [ 1]=
              0.00000
                        0.00000
DATA: [ 2]=
              0.00000
                        0.00000
DATA: [3]=
              0.00000
                        0.00000
                        0.00000
DATA: [4]=
              0.00000
DATA: [5]=
              0.00000
                        0.00000
DATA: [ 6]=
              0.00000
                        0.00000
DATA: [7]=
              0.00000
                        0.00000
DATA: [ 8]=
              1.00000
                        9.00000
DATA: [ 9]=
              1.00000
                       17.00000
DATA: [10]=
              1.00000
                       24.00000
DATA: [11]=
              1.00000
                       30.00000
DATA: [12]=
              1.00000
                       35.00000
DATA: [13]=
              0.00000
                       30.00000
DATA: [14]=
              0.00000
                       25.00000
DATA: [15]=
              0.00000
                       20.00000
DATA: [16]=
              0.00000
                       15.00000
DATA: [17]=
              0.00000
                       10.00000
DATA: [18]=
              0.00000
                        6.00000
DATA: [19]=
              0.00000
                        3.00000
INFO: Exiting fifo_fir simulation
INFO: Simulation fifo_fir PASSED with 0 errors
```

Signal	Value at C0	0	50000	100000				150000					200000				
clk	"b0				Л	Л	Л	Л	Л	Л	Л	J	Л	Л			
data_in	0	0															
data_out	3	0		9	17	24	30	35	30	25	20	15	10	6	3		
orig_in	0	0		1					0								
reset	'b0																