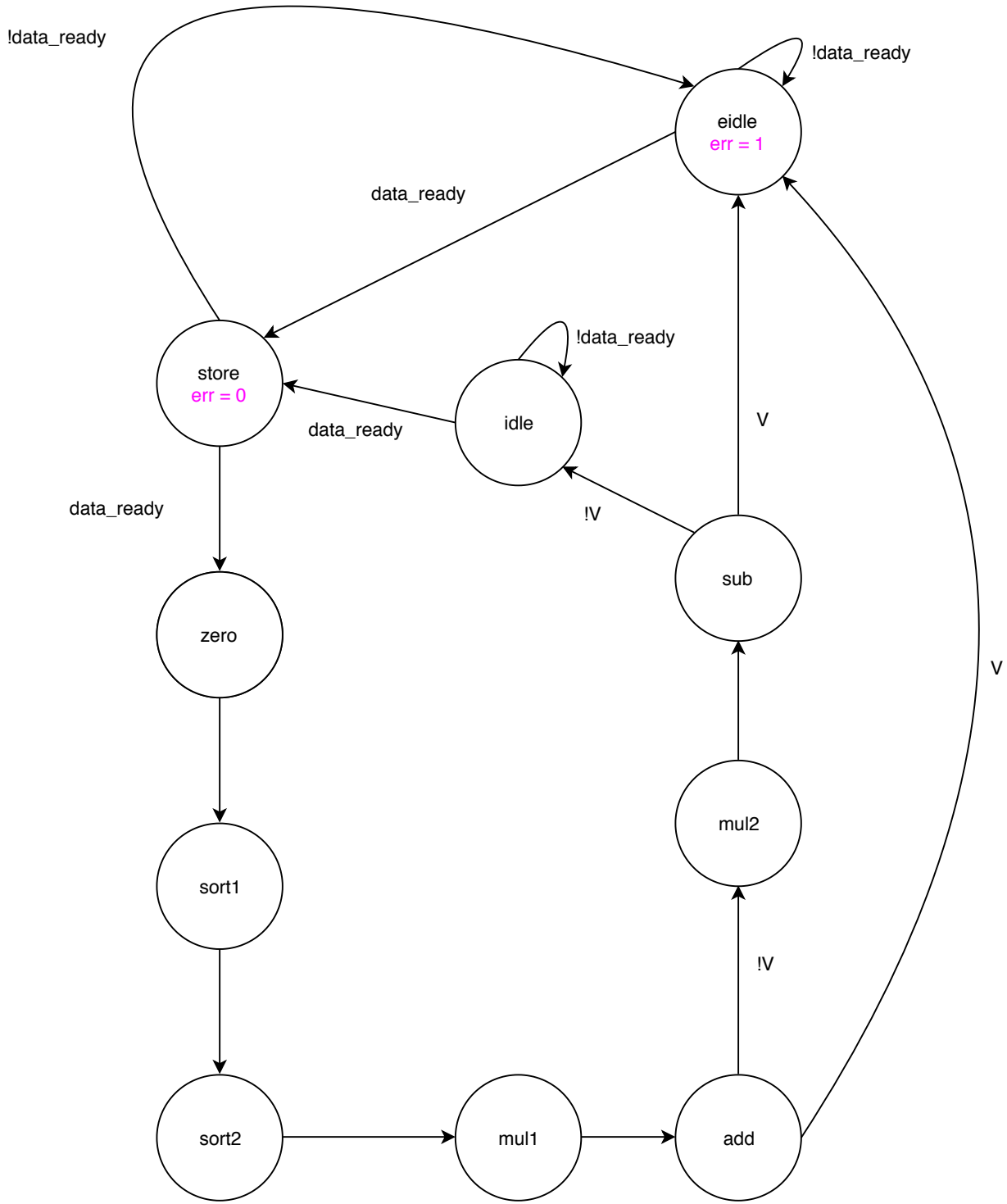
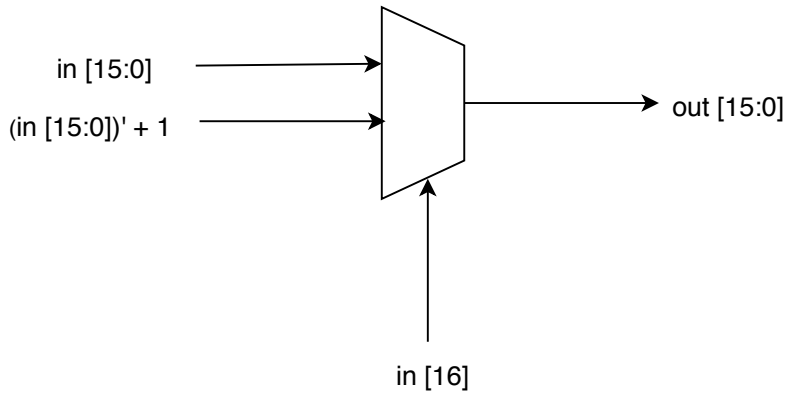
State Diagram for 2 point High-Pass Filter



Pseudo-code for 4-input High-Pass FIR filter

```
idle: if (data_ready = 0) goto idle; //wait until data ready = 1
      if (load_coeff) goto load;
load:
      case(state) begin
        start: modwait = 0;
           if(load_coeff) goto load1;
   load1:  reg[9] = coef_1;
        modwait = 1;
   wait1: modwait = 0;
           if(load_coeff) goto load2;
   load2: reg[8] = coef_2;
        modwait = 1;
   wait2: modwait = 0;
           if(load_coeff) goto load3;
   load3: reg[7] = coef_3;
        modwait = 1;
   wait3: modwait = 0;
           if(load_coeff) goto load4;
   load4: reg[6] = coef_4;
           modwait = 1;
           goto idle;
      end
store: if (data_ready = 0) goto idle;
       reg[5] = data;
       err = 0;
       modwait = 1
zero:  reg[0] = 0;
sort1: reg[1] = reg[2]; //reorder registers
sort2: reg[2] = reg[3]; //reorder registers
sort3: reg[3] = reg[4]; //reorder registers
sort4: reg[4] = reg[5]; //reorder registers
mul1:  reg[10] = reg[1] * reg[6];//sample4 * F3
add1:  reg[0] = reg[0] + reg[10];
       if (overflow) goto eidle;
mul2:  reg[10] = reg[2] * reg[7];//sample3 * F2
sub1:  reg[0] = reg[0] - reg[10];
       if (overflow) goto eidle;
mul3:  reg[10] = reg[3] * reg[8];//sample2 * F1
add2:  reg[0] = reg[0] + reg[10];
       if(overflow) goto eidle;
mul4:  reg[10] = reg[4] * reg[9];//sample1 * F0
sub2:  reg[0] = reg[0] - reg[10];
       if(overflow) goto eidle;
       else goto idle;
eidle: err = 1;
       modwait = 0
       if (data_ready=1) goto store;
       if (data_ready = 0) goto eidle;
```

schematic for magnitude block



State Transition diagram for the 4 point High Pass FIR filter