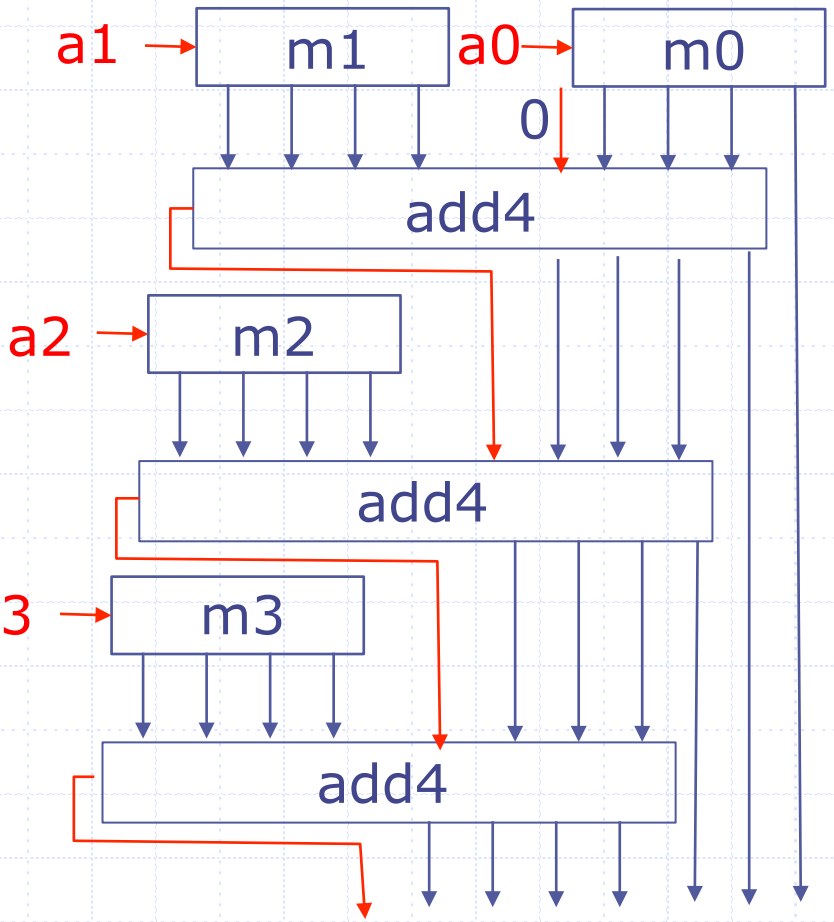
Multiplication by repeated addition

```
b Multiplicand  1101   (13)
a Muliplier   *  1011   (11)

tp                0000
m0          +     1101
tp              01101
m1          +     1101
tp             100111
m2          +   0000
tp            0100111
m3          + 1101
tp           10001111   (143)
```




```
mi = (a[i]==0)? 0 : b;
```

Combinational 32-bit multiply

```
function Bit#(64) mul32(Bit#(32) a, Bit#(32) b);
  Bit#(32) tp = 0;
  Bit#(32) prod = 0;
  for(Integer i = 0; i < 32; i = i+1)
  begin
     Bit#(32) m   = (a[i]==0)? 0 : b;
     Bit#(33) sum = add32(m,tp,0);
     prod[i:i]    = sum[0];
     tp           = sum[32:1];
  end
  return {tp,prod};
endfunction
```

Combinational multiply uses 31 add32 circuits

We can reuse the same add32 circuit if we store the partial results in a *register*