Shyamal Anadkat
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shifter.v : 16 bit barrel shifter top-hier

Cnt[0] (En)   Cnt[1] (En)   Cnt[2] (En)   Cnt[3] (En)
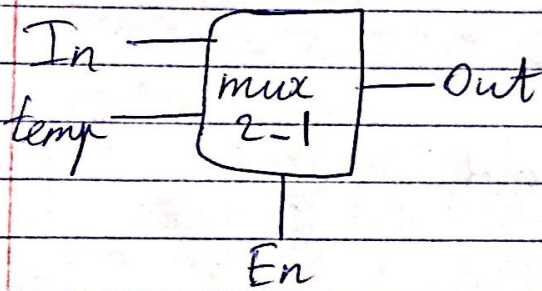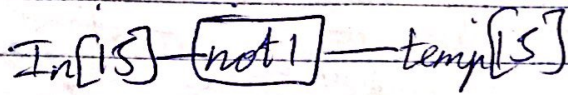
In [15:0]

| shifter1 | 16 | shifter2 | 16 | shifter4 | 16 | shifter8 |

Out [15:0]

Op[1:0]

a
b
c   [or4]
d   [or2]— out
e
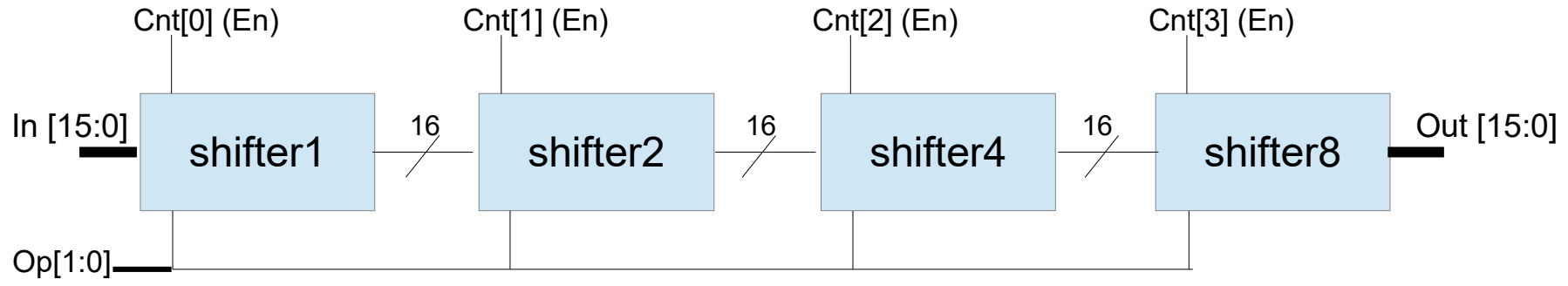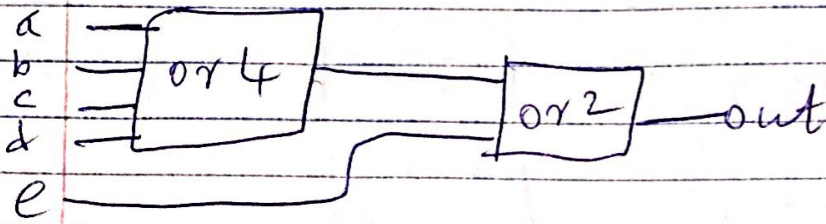
(or16 uses or2, and16 uses and2)

inv16:

In[0] —[not1]— temp[0]
  :   :   :
In[15] —[not1]— temp[15]
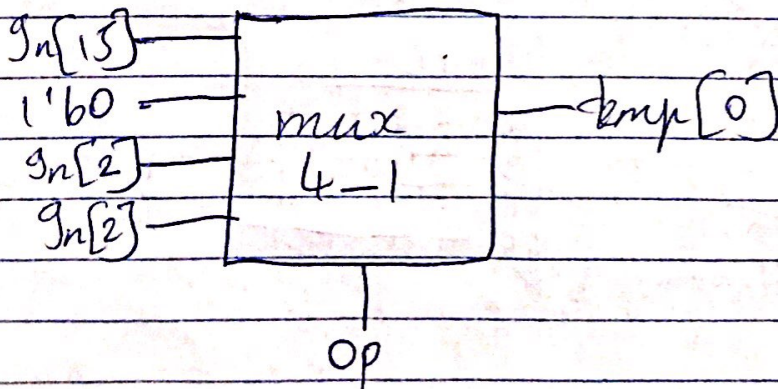
In ——[mux 2-1]— Out
temp ——
        |
        En
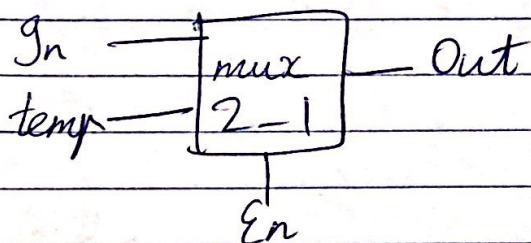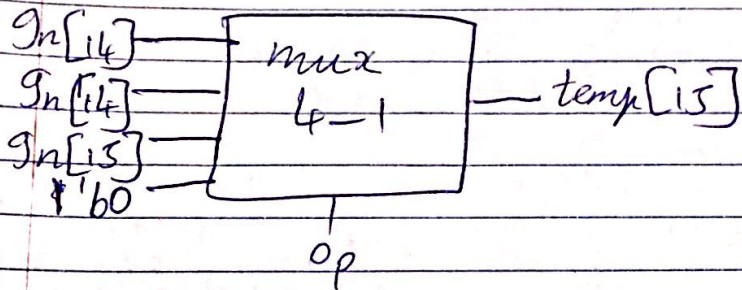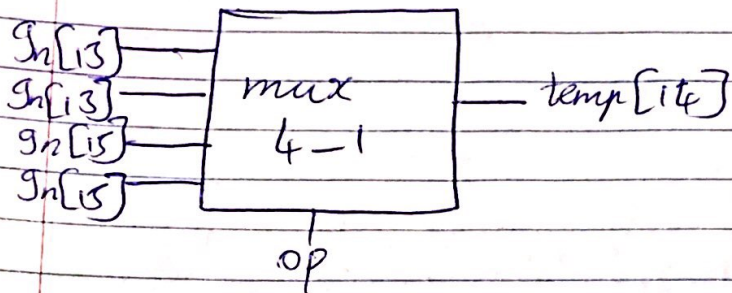
Shifters, similar except how they start (Eg. Shifter1 starts with In[15] and 1'b0).

Shifter2 starts with In[14], 1'b0 and In[15], 1'b0

Shifter1:

In[15] —
1'b0 —[mux 4-1]— temp[0]
In[2] —
In[2] —
        |
        Op

shifter1.v

.
.
.

In[13] ────┐ ┌─────────┐
In[13] ────┤ │ mux   │────── temp[14]
In[15] ────┤ │ 4─1   │
In[15] ────┘ └─────────┘
                  │
                 op

In[14] ────┐ ┌─────────┐
In[14] ────┤ │ mux   │────── temp[15]
In[15] ────┤ │ 4─1   │
1'b0   ────┘ └─────────┘
                  │
                 op

In ────┐ ┌───────┐
       │ │ mux   │──── Out
temp ──┘ │ 2─1   │
         └───────┘
             │
            En

In Shifter 2, last 2 D inputs of mux 4─1 are zeros.
In Shifter 4, last 4 D inputs of mux 4─1 are zeros.
Similarly, for shifter 8, last 8 are zeros.