

not_c.v X

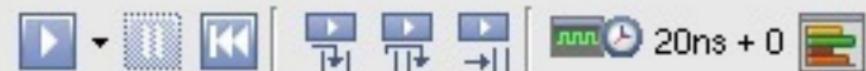
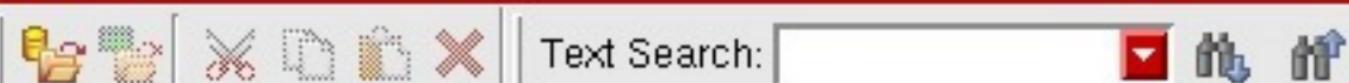
```
module not_c(a,y);

    input a;
    output y;
    supply1 vdd;
    supply0 vss;

    pmos P1(y,vdd,a);
    nmos N1(y,vss,a);
endmodule
```



File Edit View Simulation Windows Help



```
ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm not_c_tb.a not_c_tb.y
Created probe 1
ncsim> run
a=0,y=1
a=1,y=0
Simulation complete via $finish(1) at time 20 NS + 0
./not_c_tb.v:21      $finish;
ncsim>
```



File Edit View Search Tools Documents Help



not_c_tb.v

```
module not_c_tb();

    reg a;
    wire y;

    not_c DUT(a,y);

    initial
    begin

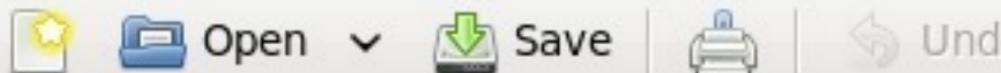
        $monitor("a=%b,y=%b",a,y);

    end

    initial
    begin

        #0;a=0;
        #10;a=1;
        #10;
        $finish;
        end
endmodule
```





nand_c.v

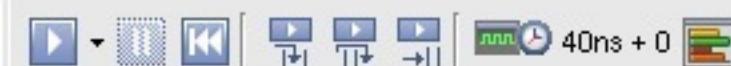
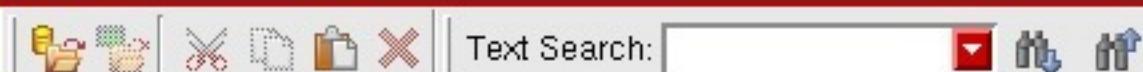
```
module nand_c(a,b,y);

    input a,b;
    output y;
    supply1 vdd;
    supply0 vss;
    wire w;
    pmos P1(y,vdd,a);
    pmos P2(y,vdd,b);
    nmos N1(w,vss,b);
    nmos N2(y,w,a);

endmodule
```



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```
ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm nand_c_tb.a nand_c_tb.b nand_c_tb.y
Created probe 1
ncsim> run
Time=                      0, a=0, b=0, y=1
Time=                      10, a=0, b=1, y=1
Time=                      20, a=1, b=0, y=1
Time=                      30, a=1, b=1, y=0
Simulation complete via $finish(1) at time 40 NS + 0
./nand_c_tb.v:20          $finish;
ncsim>
```



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nand_c_tb.v

```
module nand_c_tb();

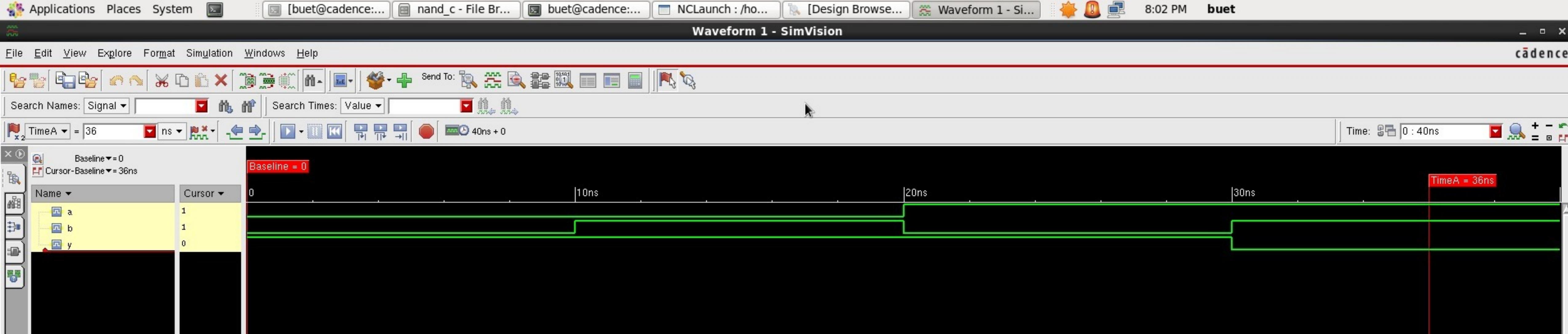
    reg a, b;
    wire y;

    nand_c NA1(a, b, y);

    initial
    begin
        $monitor("Time=%t,a=%b, b=%b, y=%b", $time, a, b, y);
    end

    initial
    begin
        #0; {a, b} = 2'd0;
        #10; {a, b} = 2'd1;
        #10; {a, b} = 2'd2;
        #10; {a, b} = 2'd3;
        #10;
        $finish;
    end

endmodule
```





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and_c.v X

```
module and_c(a,b,y);

    input a,b;
    output y;
    wire w;

    nand_c NA1(a,b,w);
    not_c NOT1(w,y);

endmodule
```



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1

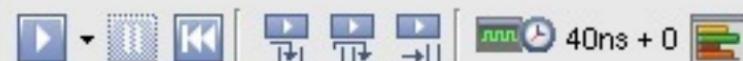
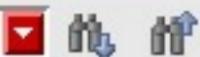
[buet@ca...]

and_c

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Text Search:



```

ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm and_c_tb.a and_c_tb.b and_c_tb.y
Created probe 1
ncsim> run
Time= 0, a=0, b=0, y=0
Time= 10, a=0, b=1, y=0
Time= 20, a=1, b=0, y=0
Time= 30, a=1, b=1, y=1
Simulation complete via $finish(1) at time 40 NS + 0
./and_c_tb.v:20      $finish;
ncsim>
```



File Edit View Search Tools Documents Help



and_c_tb.v X

```
module and_c_tb();

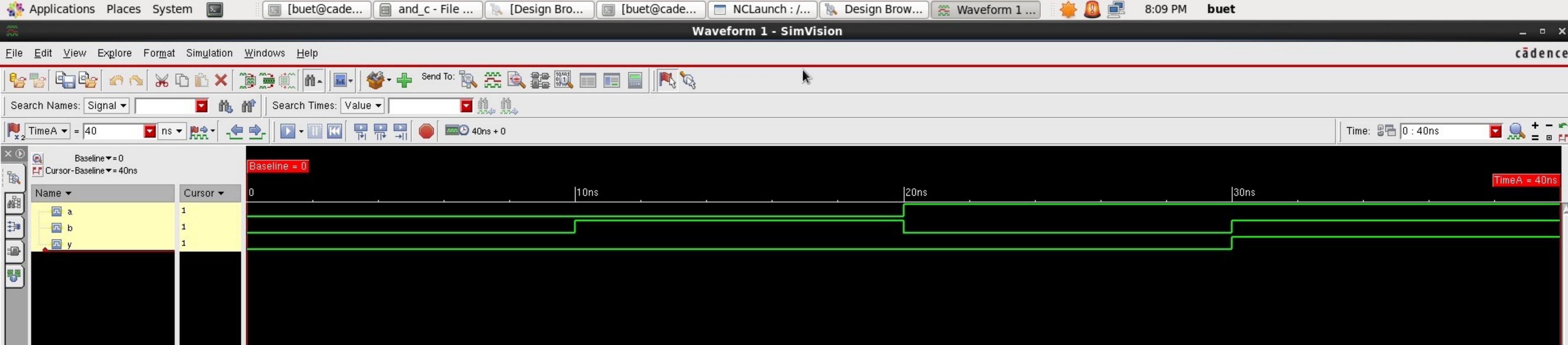
    reg a, b;
    wire y;

    and_c A1(a, b, y);

    initial
    begin
        $monitor("Time=%t,a=%b, b=%b, y=%b",$time, a, b, y);
    end

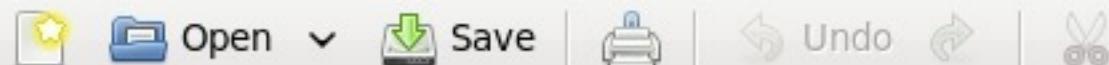
    initial
    begin
        #0; {a, b} = 2'd0;
        #10; {a, b} = 2'd1;
        #10; {a, b} = 2'd2;
        #10; {a, b} = 2'd3;
        #10;
        $finish;
    end

endmodule
```





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xnor_c.v

```
module xnor_c(a,b,y);

    input a,b;
    output y;
    supply1 vdd;
    supply0 vss;
    wire [4:0]w;

    not_c NOT1(a,w[0]);
    not_c NOT2(b,w[1]);
    pmos P1(w[2],vdd,w[0]);
    pmos P2(w[2],vdd,b);
    pmos P3(y,w[2],w[1]);
    pmos P4(y,w[2],a);
    nmos N1(y,w[3],b);
    nmos N2(w[3],vss,w[0]);
    nmos N3(y,w[4],w[1]);
    nmos N4(w[4],vss,a);

endmodule
```

Applications Places System

[buet...

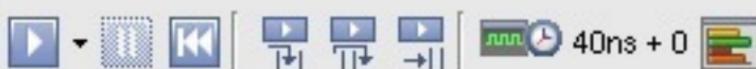
[Desig...



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Text Search:



```
ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm xnor_c_tb.a xnor_c_tb.b xnor_c_tb.y
Created probe 1
ncsim> run
Time=          0, a=0, b=0, y=1
Time=          10, a=0, b=1, y=0
Time=          20, a=1, b=0, y=0
Time=          30, a=1, b=1, y=1
Simulation complete via $finish(1) at time 40 NS + 0
./xnor_c_tb.v:20      $finish;
ncsim> |
```



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xnor_c_tb.v

```
module xnor_c_tb();

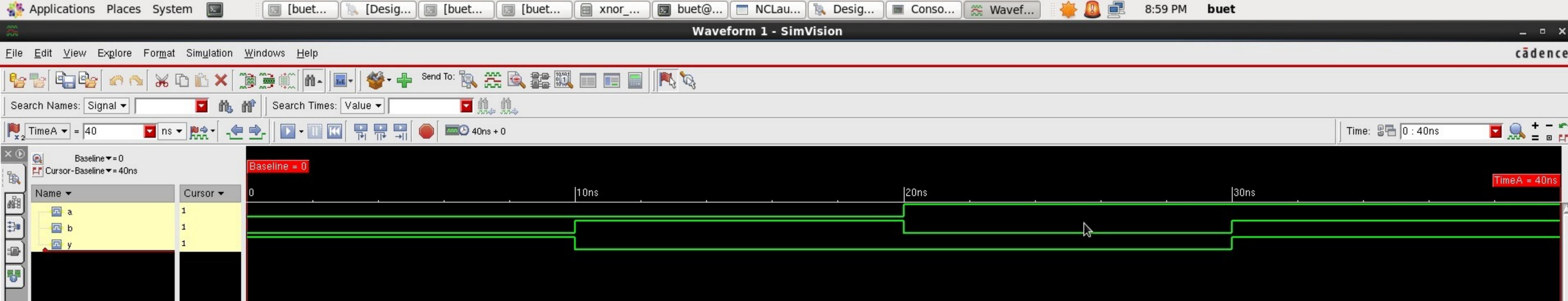
    reg a, b;
    wire y;

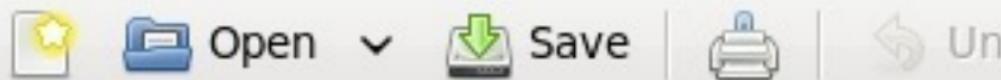
    xnor_c A1(a, b, y);

    initial
    begin
        $monitor("Time=%t,a=%b, b=%b, y=%b",$time, a, b, y);
    end

    initial
    begin
        #0; {a, b} = 2'd0;
        #10; {a, b} = 2'd1;
        #10; {a, b} = 2'd2;
        #10; {a, b} = 2'd3;
        #10;
        $finish;
    end

endmodule
```





xor_c.v

```
module xor_c(a,b,y);
```

```
    input a,b;
    output y;
    wire w;
```

```
    xnor_c XN1(a,b,w);
    not_c NOT1(w,y);
```

```
endmodule
```

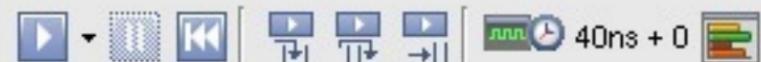




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Text Search:



```
ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm xor_c_tb.a xor_c_tb.b xor_c_tb.y
Created probe 1
ncsim> run
Time=                      0, a=0, b=0, y=0
Time=                      10, a=0, b=1, y=1
Time=                      20, a=1, b=0, y=1
Time=                      30, a=1, b=1, y=0
Simulation complete via $finish(1) at time 40 NS + 0
./xor_c_tb.v:20      $finish;
ncsim>
```



File Edit View Search Tools Documents Help



xor_c_tb.v

```
module xor_c_tb();

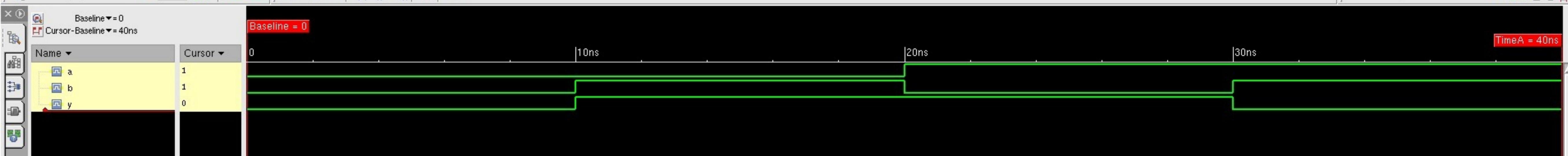
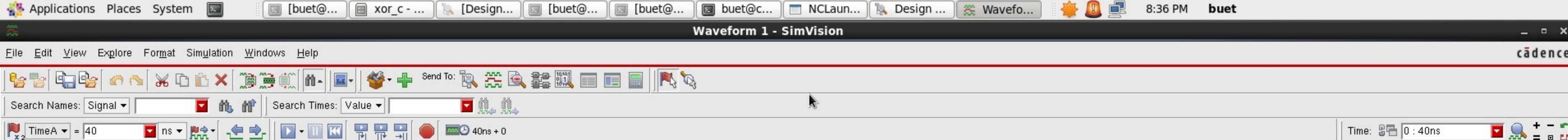
    reg a, b;
    wire y;

    xor_c A1(a, b, y);

    initial
    begin
        $monitor("Time=%t,a=%b, b=%b, y=%b",$time, a, b, y);
    end

    initial
    begin
        #0; {a, b} = 2'd0;
        #10; {a, b} = 2'd1;
        #10; {a, b} = 2'd2;
        #10; {a, b} = 2'd3;
        #10;
        $finish;
    end

endmodule
```





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Open Save Undo

nor_c.v X

```
module nor_c(a,b,y);

    input a,b;
    output y;
    wire w;
    supply1 vdd;
    supply0 vss;

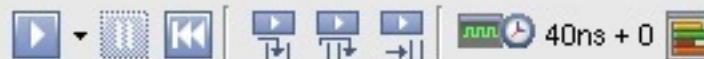
    pmos P1(w,vdd,a);
    pmos P2(y,w,b);
    nmos N1(y,vss,a);
    nmos N2(y,vss,b);
endmodule
```



File Edit View Simulation Windows Help



Text Search:



```
ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm nor_c_tb.a nor_c_tb.b nor_c_tb.y
Created probe 1
ncsim> run
Time=          0, a=0, b=0, y=1
Time=          10, a=0, b=1, y=0
Time=          20, a=1, b=0, y=0
Time=          30, a=1, b=1, y=0
Simulation complete via $finish(1) at time 40 NS + 0
./nor_c_tb.v:20      $finish;
ncsim>
```



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nor_c_tb.v

```
module nor_c_tb();

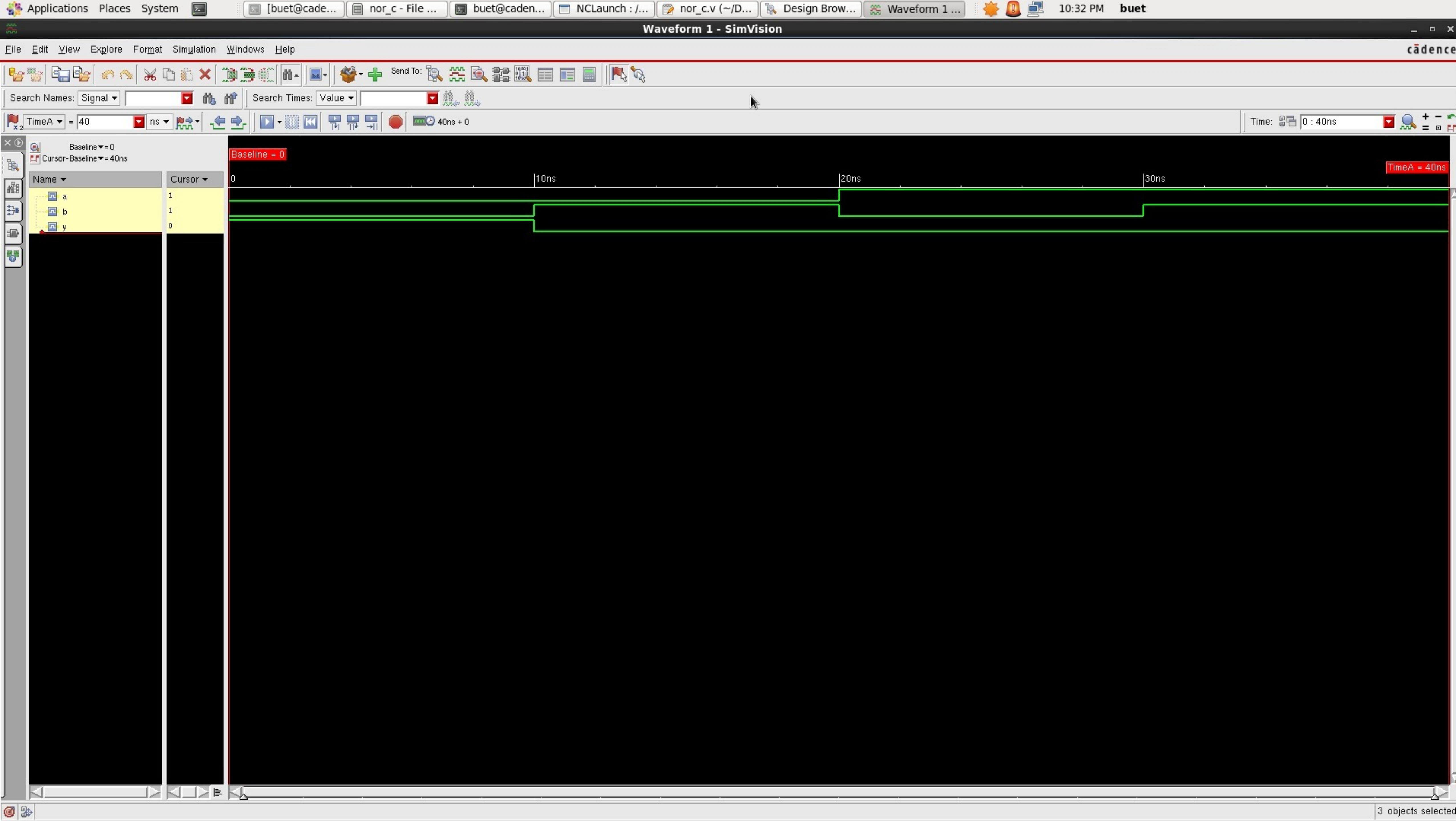
    reg a, b;
    wire y;

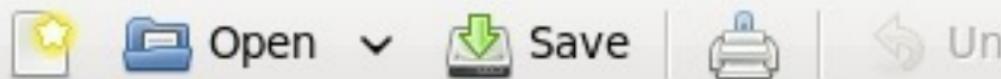
    nor_c N01(a, b, y);

    initial
    begin
        $monitor("Time=%t,a=%b, b=%b, y=%b",$time, a, b, y);
    end

    initial
    begin
        #0;  {a, b} = 2'd0;
        #10; {a, b} = 2'd1;
        #10; {a, b} = 2'd2;
        #10; {a, b} = 2'd3;
        #10;
        $finish;
    end

endmodule
```





or_c.v X

```
module or_c(a,b,y);

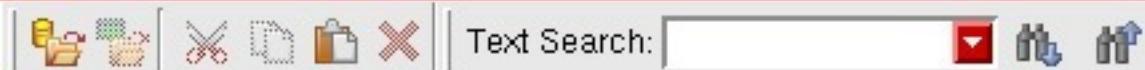
    input a,b;
    output y;
    wire w;

    nor_c N01(a,b,w);
    not_c N1(w,y);
endmodule
```





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```
ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm or_c_tb.a or_c_tb.b or_c_tb.y
Created probe 1
ncsim> run
Time=                      0, a=0, b=0, y=0
Time=                      10, a=0, b=1, y=1
Time=                      20, a=1, b=0, y=1
Time=                      30, a=1, b=1, y=1
Simulation complete via $finish(1) at time 40 NS + 0
./or_c_tb.v:20      $finish;
ncsim>
```



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or_c_tb.v X

```
module or_c_tb();

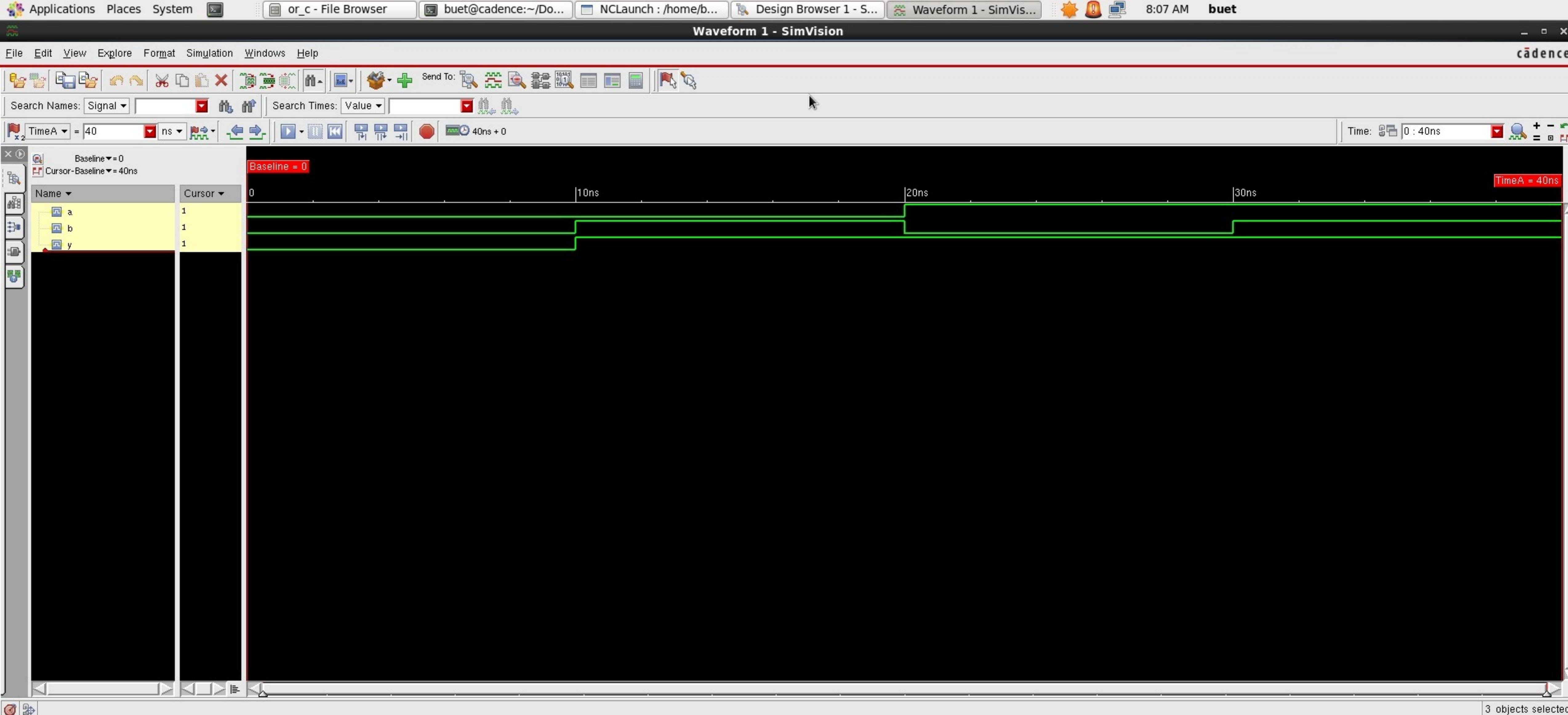
    reg a, b;
    wire y;

    or_c_01(a, b, y);

    initial
    begin
        $monitor("Time=%t,a=%b, b=%b, y=%b",$time, a, b, y);
    end

    initial
    begin
        #0; {a, b} = 2'd0;
        #10; {a, b} = 2'd1;
        #10; {a, b} = 2'd2;
        #10; {a, b} = 2'd3;
        #10;
        $finish;
    end

endmodule
```





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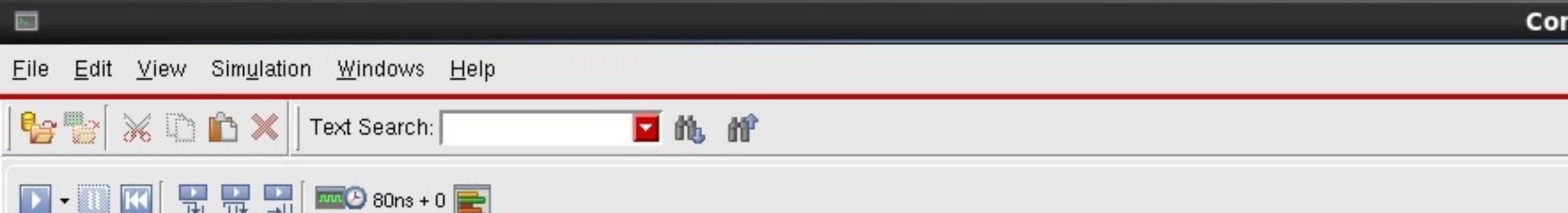
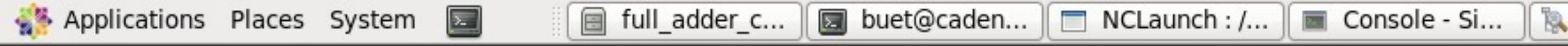


full_adder_c.v

```
module full_adder_c(a,b,cin,sum,cout);

    input a,b,cin;
    output sum,cout;
    wire [4:0]w;

    xor_c X1(a,b,w[0]);
    xor_c X2(w[0],cin,sum);
    and_c A1(a,b,w[1]);
    and_c A2(b,cin,w[2]);
    and_c A3(cin,a,w[3]);
    or_c O3(w[1],w[2],w[4]);
    or_c O4(w[3],w[4],cout);
endmodule
```



```
ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm full_adder_c_tb.a full_adder_c_tb.b full_adder_c_tb.cin full_adder_c_tb.cout full_adder_c_tb.sum
Created probe 1
ncsim> run
Time=          0 a=0 b=0 cin=0 sum=0 cout=0
Time=         10 a=0 b=0 cin=1 sum=1 cout=0
Time=         20 a=0 b=1 cin=0 sum=1 cout=0
Time=         30 a=0 b=1 cin=1 sum=0 cout=1
Time=         40 a=1 b=0 cin=0 sum=1 cout=0
Time=         50 a=1 b=0 cin=1 sum=0 cout=1
Time=         60 a=1 b=1 cin=0 sum=0 cout=1
Time=         70 a=1 b=1 cin=1 sum=1 cout=1
Simulation complete via $finish(1) at time 80 NS + 0
./full_adder_c_tb.v:26  $finish;
ncsim>
```



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full_adder_c_tb.v

```
module full_adder_c_tb();

    reg a,b,cin;
    wire sum,cout;

    full_adder_c FA1(a,b,cin,sum,cout);

    initial
    begin
        $monitor("Time=%t a=%b b=%b cin=%b sum=%b cout=%b", $time, a, b, cin, sum, cout);

    end
    initial
    begin

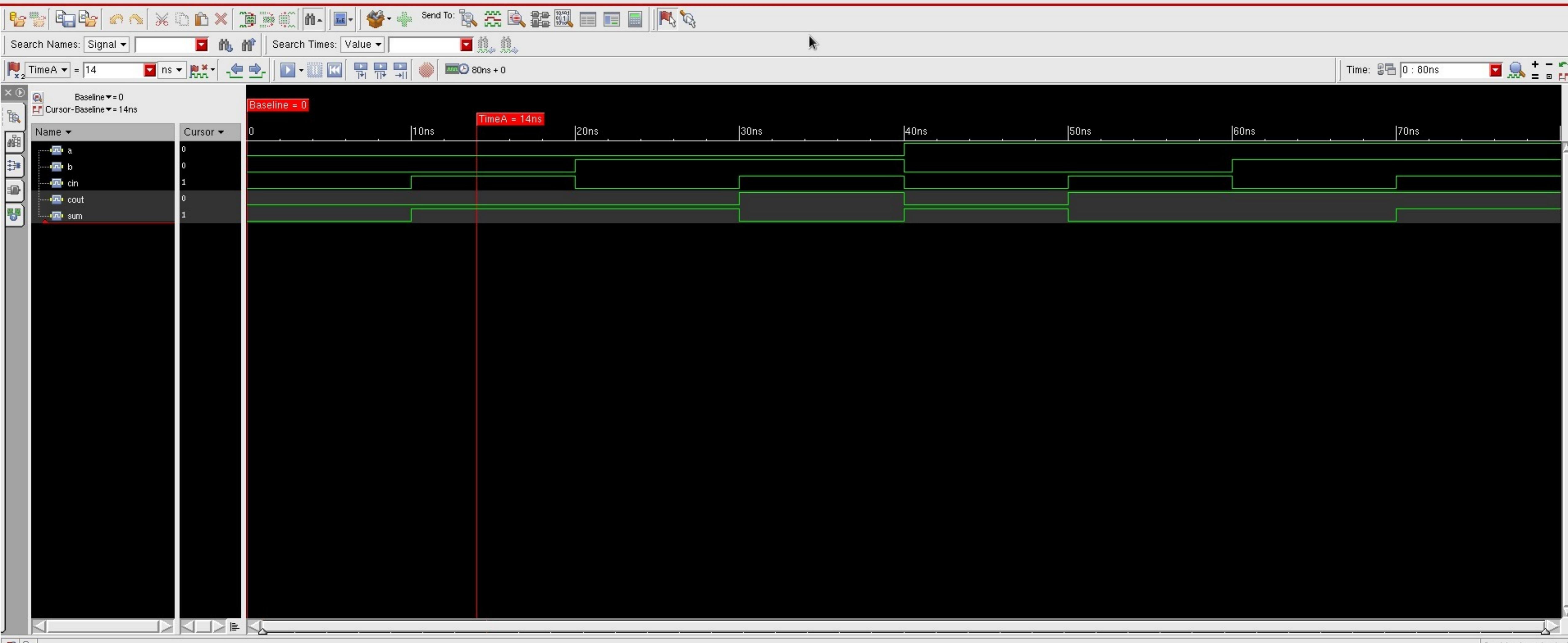
        #0; {a,b,cin}=3'd0;
        #10; {a,b,cin}=3'd1;
        #10; {a,b,cin}=3'd2;
        #10; {a,b,cin}=3'd3;
        #10; {a,b,cin}=3'd4;
        #10; {a,b,cin}=3'd5;
        #10; {a,b,cin}=3'd6;
        #10; {a,b,cin}=3'd7;
        #10;
        $finish;

    end
endmodule
```

Waveform 1 - SimVision

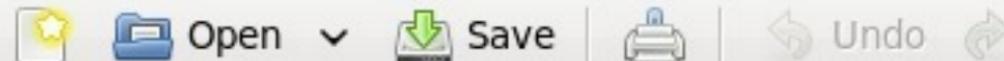
File Edit View Explore Format Simulation Windows Help

cādence





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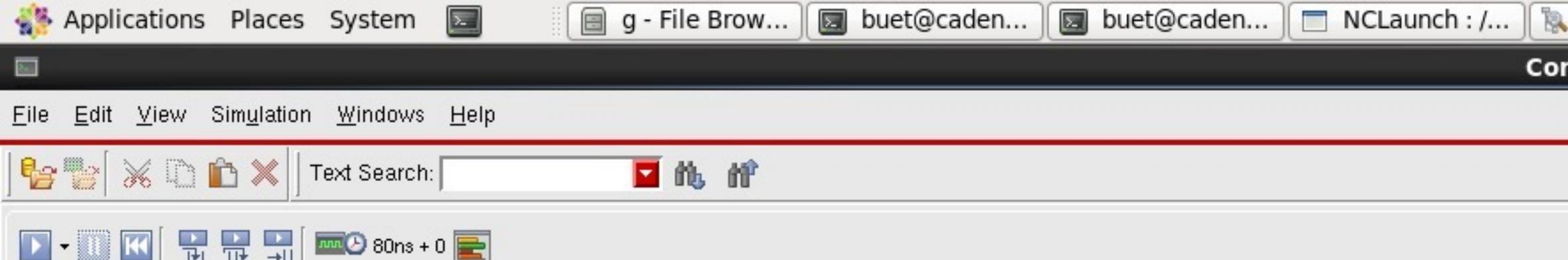


full_adder_g.v X

```
module full_adder_g(a,b,cin,sum,cout);

    input a,b,cin;
    output sum,cout;
    wire [2:0]w;

    xor X1(sum,a,b,cin);
    and A1(w[0],a,b);
    and A2(w[1],b,cin);
    and A3(w[2],cin,a);
    or O3(cout,w[0],w[1],w[2]);
endmodule
```



```
ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm full_adder_g_tb.a full_adder_g_tb.b full_adder_g_tb.cin full_adder_g_tb.cout full_adder_g_tb.sum
Created probe 1
ncsim> run
Time=          0 a=0 b=0 cin=0 sum=0 cout=0
Time=         10 a=0 b=0 cin=1 sum=1 cout=0
Time=         20 a=0 b=1 cin=0 sum=1 cout=0
Time=         30 a=0 b=1 cin=1 sum=0 cout=1
Time=         40 a=1 b=0 cin=0 sum=1 cout=0
Time=         50 a=1 b=0 cin=1 sum=0 cout=1
Time=         60 a=1 b=1 cin=0 sum=0 cout=1
Time=         70 a=1 b=1 cin=1 sum=1 cout=1
Simulation complete via $finish(1) at time 80 NS + 0
./full_adder_g_tb.v:26  $finish;
ncsim>
```



File Edit View Search Tools Documents Help



full_adder_g_tb.v X

```
module full_adder_g_tb();

    reg a,b,cin;
    wire sum,cout;

    full_adder_g FA1(a,b,cin,sum,cout);

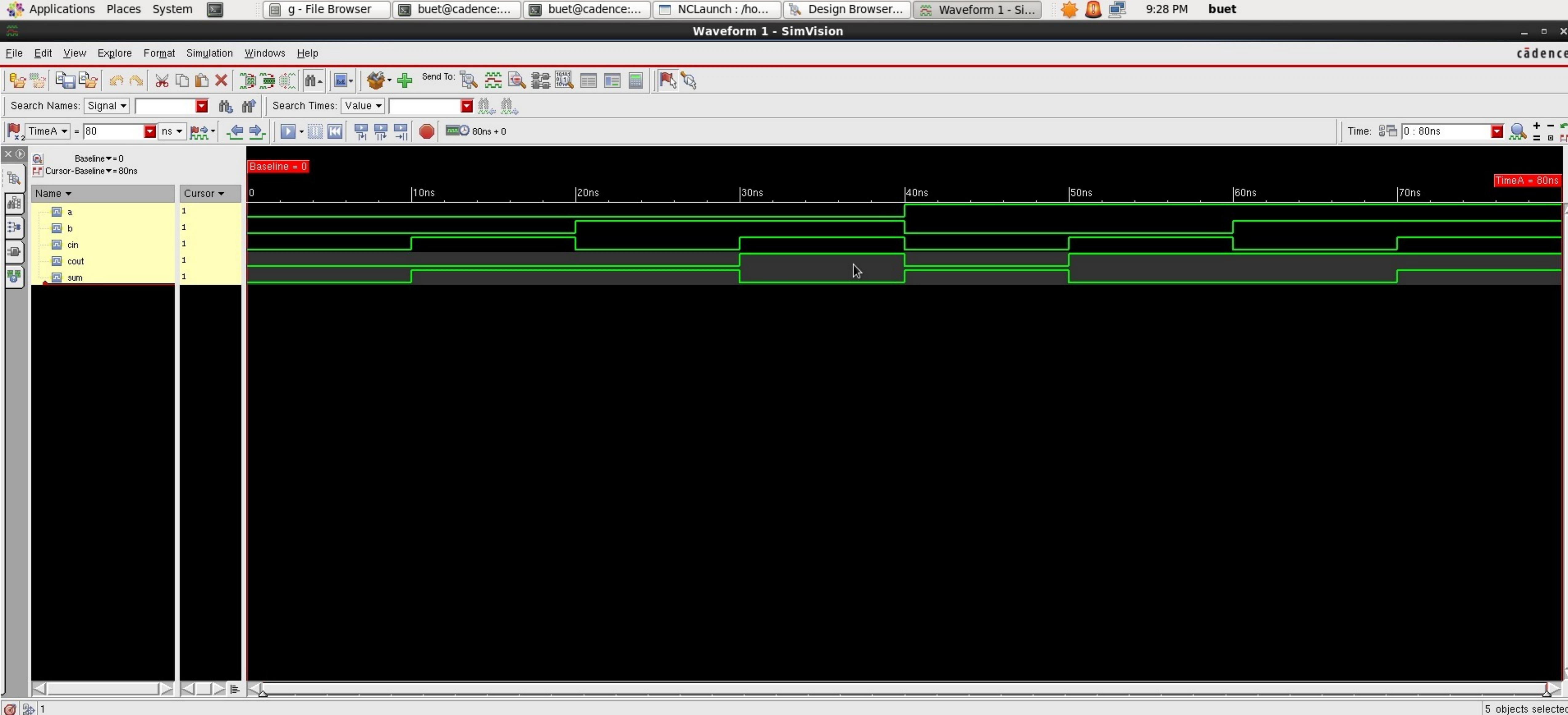
    initial
    begin

        $monitor("Time=%t a=%b b=%b cin=%b sum=%b cout=%b",$time,a,b,cin,sum,cout);

    end
    initial
    begin

        #0; {a,b,cin}=3'd0;
        #10; {a,b,cin}=3'd1;
        #10; {a,b,cin}=3'd2;
        #10; {a,b,cin}=3'd3;
        #10; {a,b,cin}=3'd4;
        #10; {a,b,cin}=3'd5;
        #10; {a,b,cin}=3'd6;
        #10; {a,b,cin}=3'd7;
        #10;
        $finish;

    end
endmodule
```





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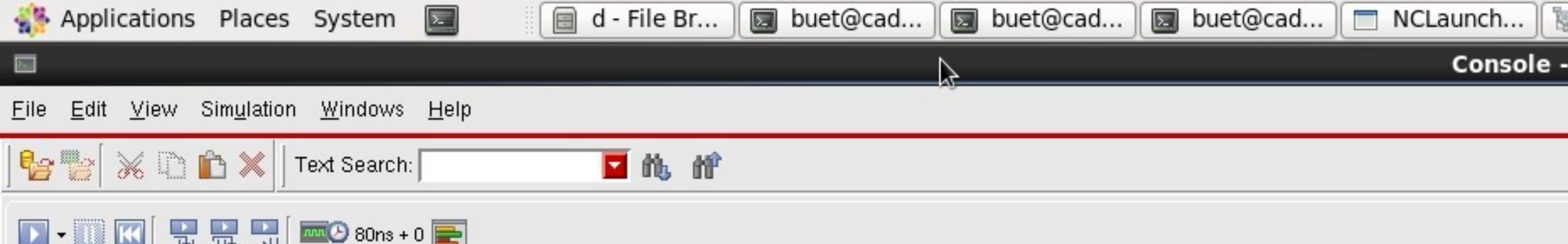


full_adder_d.v

```
module full_adder_d(a,b,cin,sum,cout);

    input a,b,cin;
    output sum,cout;

    assign {cout,sum}={(a&b)|(b&cin)|(cin&a),a^b^cin};
endmodule
```



```
ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm full_adder_d_tb.a full_adder_d_tb.b full_adder_d_tb.cin full_adder_d_tb.cout full_adder_d_tb.sum
Created probe 1
ncsim> run
Time= 0 a=0 b=0 cin=0 sum=0 cout=0
Time= 10 a=0 b=0 cin=1 sum=1 cout=0
Time= 20 a=0 b=1 cin=0 sum=1 cout=0
Time= 30 a=0 b=1 cin=1 sum=0 cout=1
Time= 40 a=1 b=0 cin=0 sum=1 cout=0
Time= 50 a=1 b=0 cin=1 sum=0 cout=1
Time= 60 a=1 b=1 cin=0 sum=0 cout=1
Time= 70 a=1 b=1 cin=1 sum=1 cout=1
Simulation complete via $finish(1) at time 80 NS + 0
./full_adder_d_tb.v:26  $finish;
ncsim>
```



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full_adder_d_tb.v

```
module full_adder_d_tb();

    reg a,b,cin;
    wire sum,cout;

    full_adder_d FA1(a,b,cin,sum,cout);

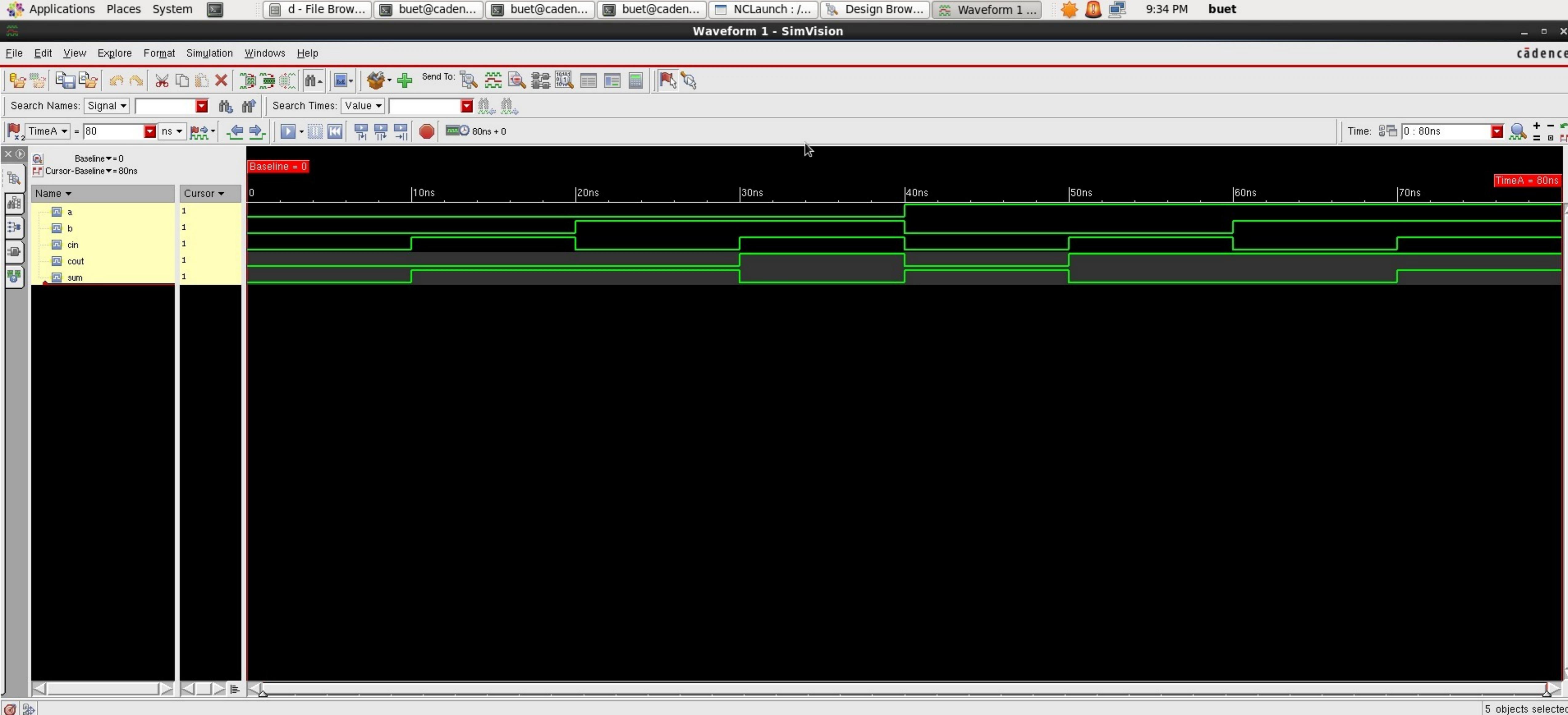
    initial
    begin

        $monitor("Time=%t a=%b b=%b cin=%b sum=%b cout=%b",$time,a,b,cin,sum,cout);

    end
    initial
    begin

        #0; {a,b,cin}=3'd0;
        #10; {a,b,cin}=3'd1;
        #10; {a,b,cin}=3'd2;
        #10; {a,b,cin}=3'd3;
        #10; {a,b,cin}=3'd4;
        #10; {a,b,cin}=3'd5;
        #10; {a,b,cin}=3'd6;
        #10; {a,b,cin}=3'd7;
        #10;
        $finish;

    end
endmodule
```





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Open



Save



Undo

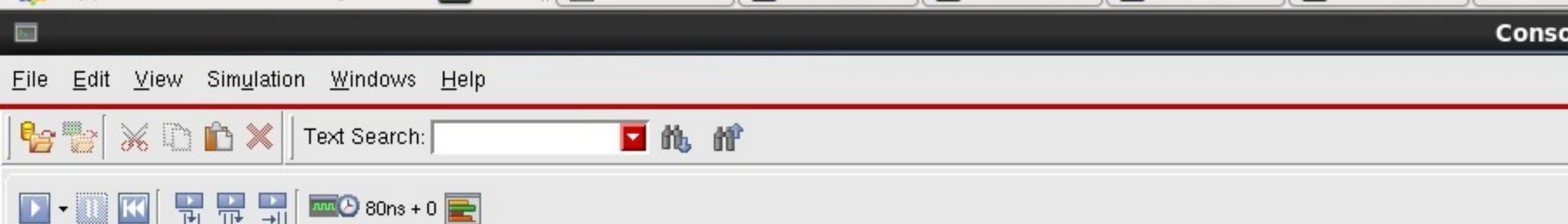


full_adder_b.v


```
module full_adder_b(a,b,cin,sum,cout);

    input a,b,cin;
    output reg sum,cout;

    always@(a,b,cin)
    case({a,b,cin})
        3'd0:{cout,sum}=2'd0;
        3'd1:{cout,sum}=2'd1;
        3'd2:{cout,sum}=2'd1;
        3'd3:{cout,sum}=2'd2;
        3'd4:{cout,sum}=2'd1;
        3'd5:{cout,sum}=2'd2;
        3'd6:{cout,sum}=2'd2;
        3'd7:{cout,sum}=2'd3;
    default:{cout,sum}=2'dx;
    endcase
endmodule
```



```
ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm full_adder_b_tb.a full_adder_b_tb.b full_adder_b_tb.cin full_adder_b_tb.cout full_adder_b_tb.sum
Created probe 1
ncsim> run
Time=          0 a=0 b=0 cin=0 sum=0 cout=0
Time=          10 a=0 b=0 cin=1 sum=1 cout=0
Time=          20 a=0 b=1 cin=0 sum=1 cout=0
Time=          30 a=0 b=1 cin=1 sum=0 cout=1
Time=          40 a=1 b=0 cin=0 sum=1 cout=0
Time=          50 a=1 b=0 cin=1 sum=0 cout=1
Time=          60 a=1 b=1 cin=0 sum=0 cout=1
Time=          70 a=1 b=1 cin=1 sum=1 cout=1
Simulation complete via $finish(1) at time 80 NS + 0
./full_adder_b_tb.v:26  $finish;
ncsim>
```



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full_adder_b_tb.v X

```
module full_adder_b_tb();

    reg a,b,cin;
    wire sum,cout;

    full_adder_b FA1(a,b,cin,sum,cout);

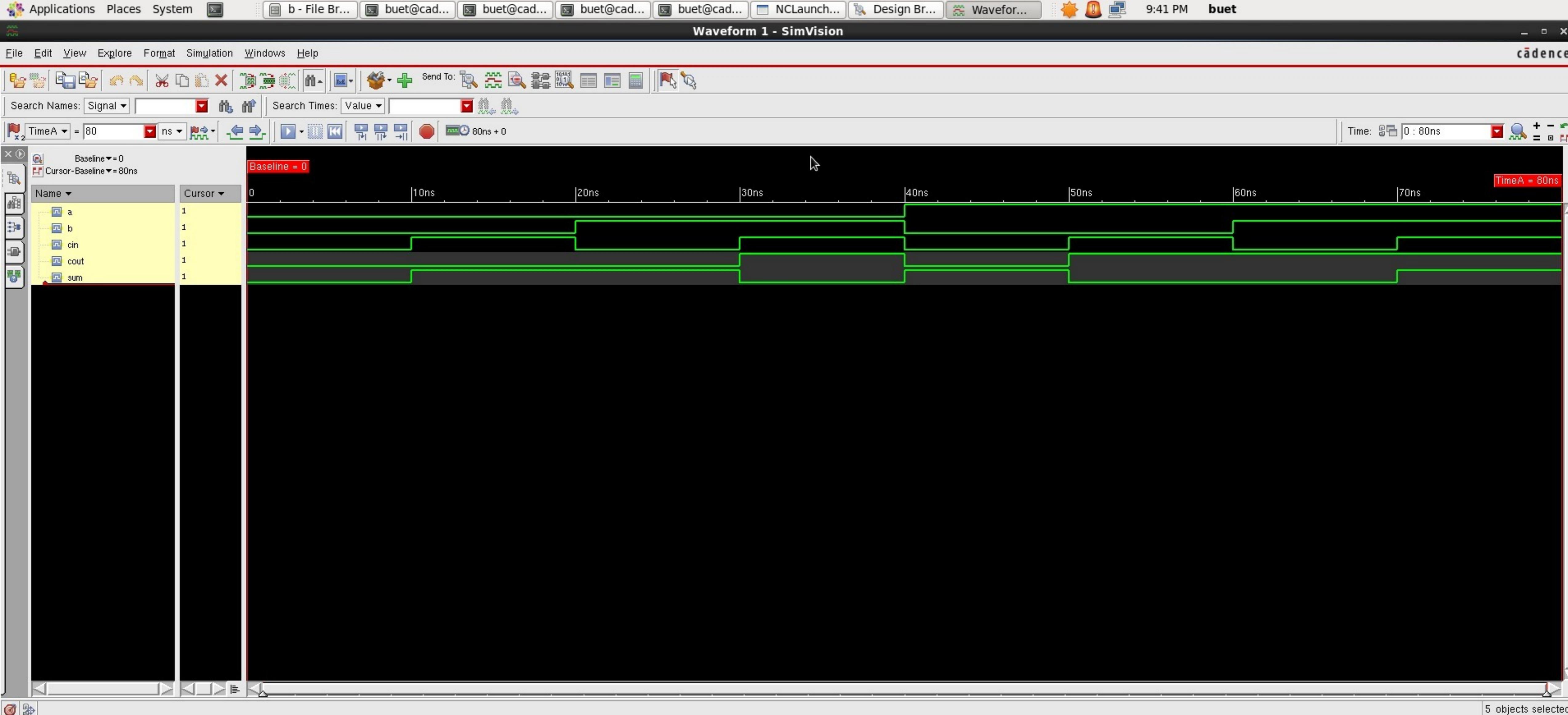
    initial
    begin

        $monitor("Time=%t a=%b b=%b cin=%b sum=%b cout=%b",$time,a,b,cin,sum,cout);

    end
    initial
    begin

        #0; {a,b,cin}=3'd0;
        #10; {a,b,cin}=3'd1;
        #10; {a,b,cin}=3'd2;
        #10; {a,b,cin}=3'd3;
        #10; {a,b,cin}=3'd4;
        #10; {a,b,cin}=3'd5;
        #10; {a,b,cin}=3'd6;
        #10; {a,b,cin}=3'd7;
        #10;
        $finish;

    end
endmodule
```





full_adder_na.v



```
module full_adder_na(a,b,cin,sum,cout);

    input a,b,cin;
    output sum,cout;
    wire [6:0]w;

    nand NA1(w[0],a,b);
    nand NA2(w[1],a,w[0]);
    nand NA3(w[2],b,w[0]);
    nand NA4(w[3],w[1],w[2]);
    nand NA5(w[4],w[3],cin);
    nand NA6(w[5],w[3],w[4]);
    nand NA7(w[6],cin,w[4]);
    nand NA8(sum,w[5],w[6]);
    nand NA9(cout,w[0],w[4]);

endmodule
```



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Console - SimVis

File Edit View Simulation Windows Help



Text Search



```
ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm full_adder_na_tb.a full_adder_na_tb.b full_adder_na_tb.cin full_adder_na_tb.cout full_adder_na_tb.sum
Created probe 1
```

```
ncsim> run
Time= 0 a=0 b=0 cin=0 sum=0 cout=0
Time= 10 a=0 b=0 cin=1 sum=1 cout=0
Time= 20 a=0 b=1 cin=0 sum=1 cout=0
Time= 30 a=0 b=1 cin=1 sum=0 cout=1
Time= 40 a=1 b=0 cin=0 sum=1 cout=0
Time= 50 a=1 b=0 cin=1 sum=0 cout=1
Time= 60 a=1 b=1 cin=0 sum=0 cout=1
Time= 70 a=1 b=1 cin=1 sum=1 cout=1
```

Simulation complete via \$finish(1) at

./full
ncsim>



File Edit View Search Tools Documents Help



full_adder_na_tb.v

```
module full_adder_na_tb();

    reg a,b,cin;
    wire sum,cout;

    full_adder_na FA1(a,b,cin,sum,cout);

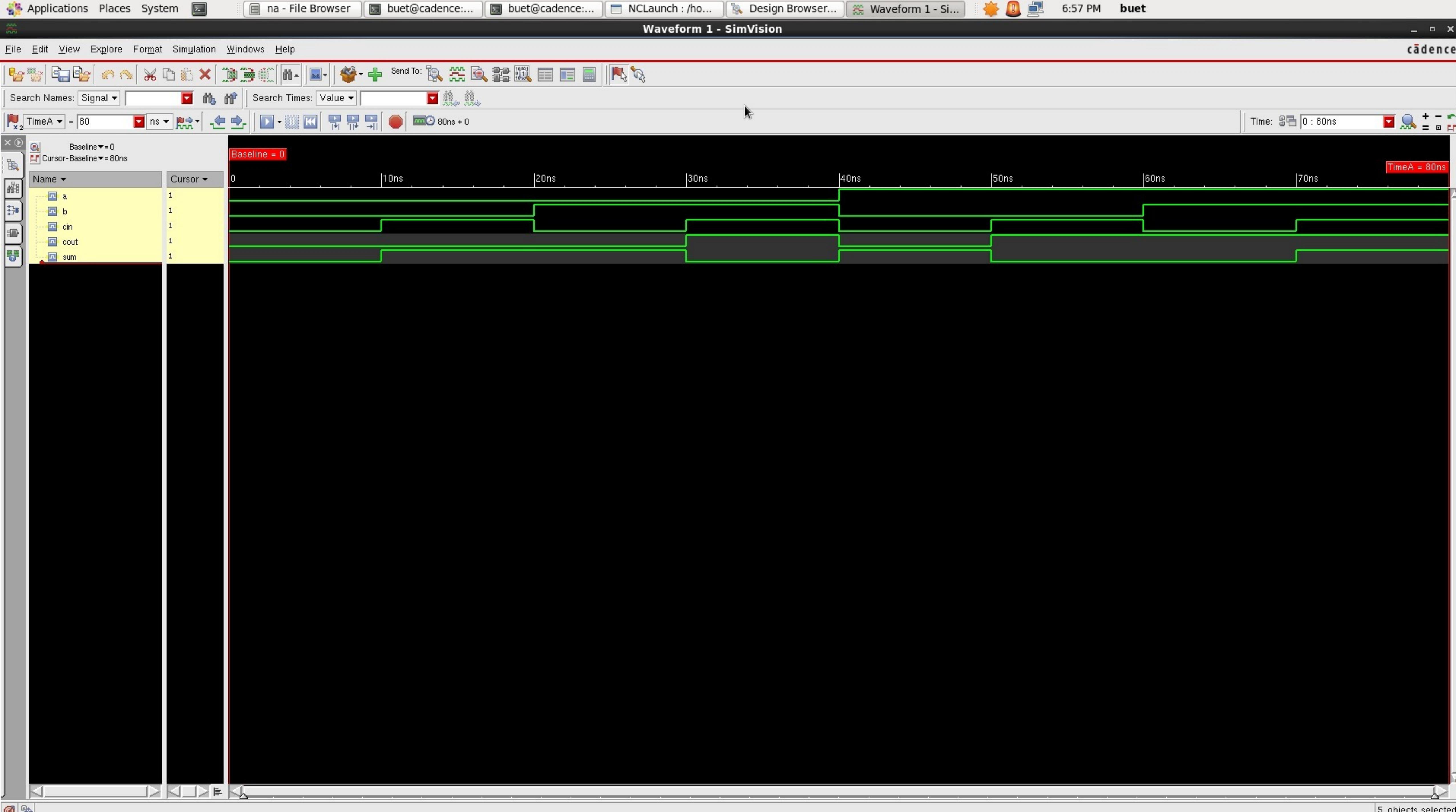
    initial
    begin

        $monitor("Time=%t a=%b b=%b cin=%b sum=%b cout=%b",$time,a,b,cin,sum,cout);

    end
    initial
    begin

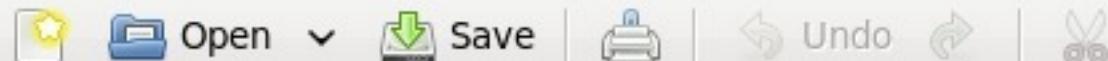
        #0; {a,b,cin}=3'd0;
        #10; {a,b,cin}=3'd1;
        #10; {a,b,cin}=3'd2;
        #10; {a,b,cin}=3'd3;
        #10; {a,b,cin}=3'd4;
        #10; {a,b,cin}=3'd5;
        #10; {a,b,cin}=3'd6;
        #10; {a,b,cin}=3'd7;
        #10;
        $finish;

    end
endmodule
```





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full_adder_no.v

```
module full_adder_no(a,b,cin,sum,cout);

    input a,b,cin;
    output sum,cout;
    wire [6:0]w;

    nor N01(w[0],a,b);
    nor N02(w[1],a,w[0]);
    nor N03(w[2],b,w[0]);
    nor N04(w[3],w[1],w[2]);
    nor N05(w[4],cin,w[3]);
    nor N06(w[5],cin,w[4]);
    nor N07(w[6],w[4],w[3]);
    nor N08(sum,w[5],w[6]);
    nor N09(cout,w[0],w[4]);
endmodule
```



```
ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm full_adder_no_tb.a full_adder_no_tb.b full_adder_no_tb.cin full_adder_no_tb.cout full_adder_no_tb.sum
Created probe 1
ncsim> run
Time=          0 a=0 b=0 cin=0 sum=0 cout=0
Time=         10 a=0 b=0 cin=1 sum=1 cout=0
Time=         20 a=0 b=1 cin=0 sum=1 cout=0
Time=         30 a=0 b=1 cin=1 sum=0 cout=1
Time=         40 a=1 b=0 cin=0 sum=1 cout=0
Time=         50 a=1 b=0 cin=1 sum=0 cout=1
Time=         60 a=1 b=1 cin=0 sum=0 cout=1
Time=         70 a=1 b=1 cin=1 sum=1 cout=1
Simulation complete via $finish(1) at time 80 NS + 0
./full_adder_no_tb.v:26      $finish;
ncsim>
```

Applications Places System no - File Browser full_adder_no_tb.v (~...)

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Open Save Undo Redo Cut Copy Paste Find Replace

full_adder_no_tb.v

```
module full_adder_no_tb();

    reg a,b,cin;
    wire sum,cout;

    full_adder_no FA1(a,b,cin,sum,cout);

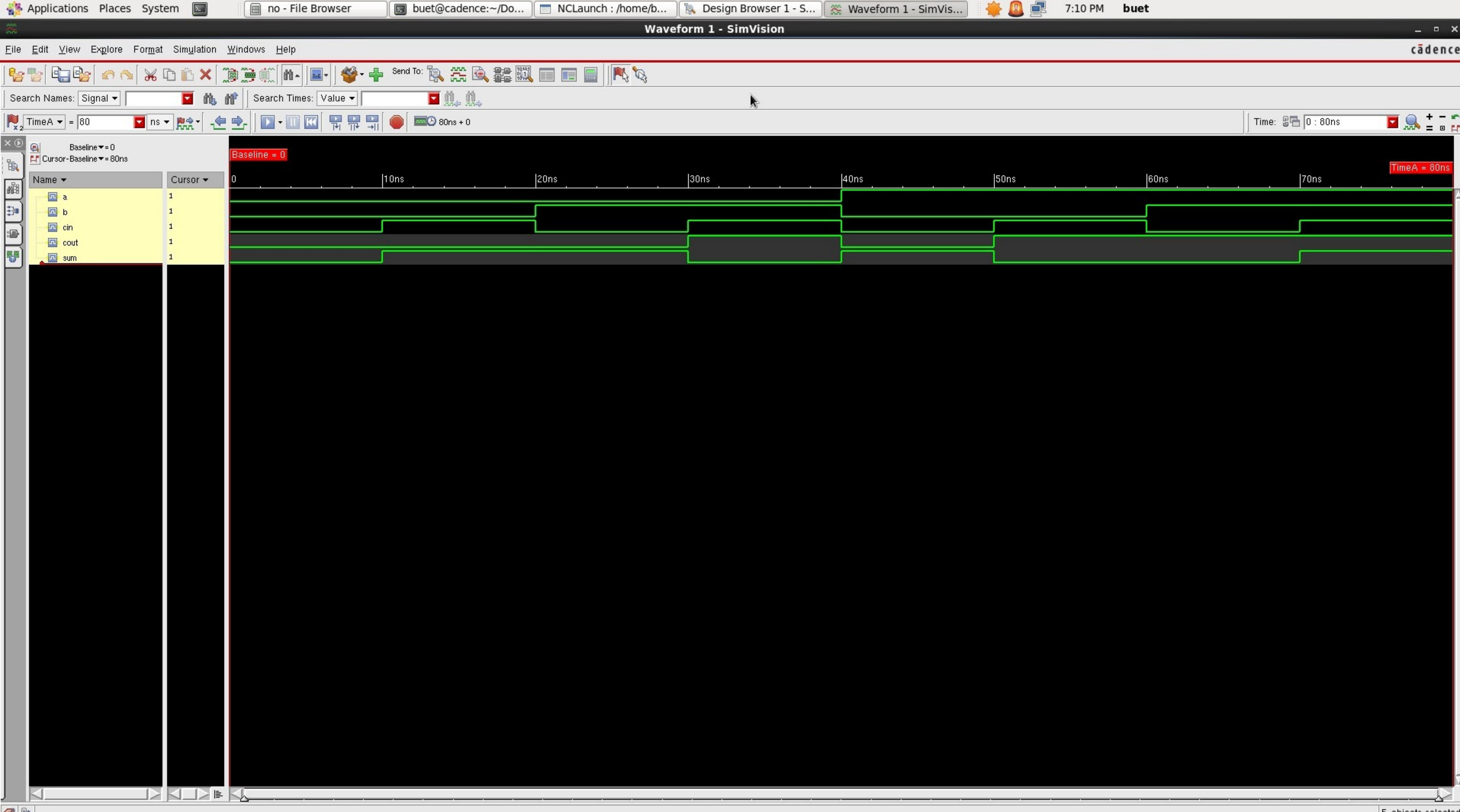
    initial
    begin

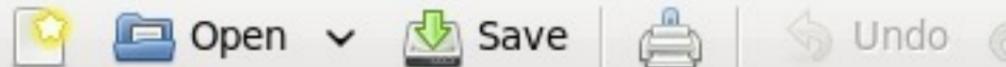
        $monitor("Time=%t a=%b b=%b cin=%b sum=%b cout=%b",$time,a,b,cin,sum,cout);

    end
    initial
    begin

        #0; {a,b,cin}=3'd0;
        #10; {a,b,cin}=3'd1;
        #10; {a,b,cin}=3'd2;
        #10; {a,b,cin}=3'd3;
        #10; {a,b,cin}=3'd4;
        #10; {a,b,cin}=3'd5;
        #10; {a,b,cin}=3'd6;
        #10; {a,b,cin}=3'd7;
        #10;
        $finish;

    end
endmodule
```





half_adder_g.v

```
module half_adder_g(a,b,sum,cout);

    input a,b;
    output sum,cout;

    xor X1(sum,a,b);
    and A1(cout,a,b);
endmodule
```



2

File Edit View Simulation Windows Help



| Text Search



```
ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm half_adder_tb_g.a half_adder_tb_g.b half_adder_tb_g.cout half_adder_tb_g.sum
Created probe 1
ncsim> run
Time= 0 a=0 b=0 sum=0 cout=0
Time= 10 a=0 b=1 sum=1 cout=0
Time= 20 a=1 b=0 sum=1 cout=0
Time= 30 a=1 b=1 sum=0 cout=1
Simulation complete via $finish(1) at time 60 NS + 0
./half_adder_tb_g.v:16  $finish;
ncsim>
```



File Edit View Search Tools Documents Help



half_adder_tb_g.v

```
module half_adder_tb_g();

    reg a,b;
    wire sum,cout;

    half_adder_g HA1(a,b,sum,cout);

    initial
    begin

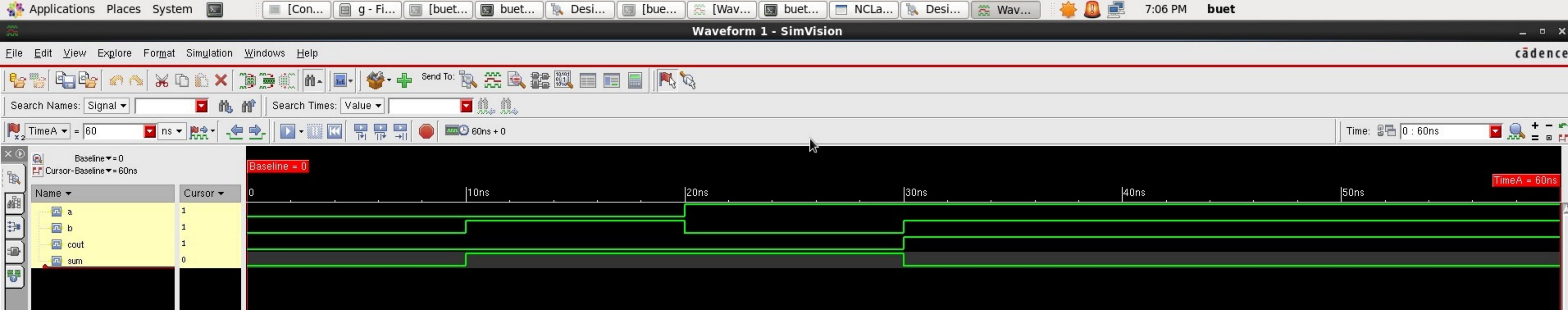
        #0; {a,b}= 2'd0;
        #10; {a,b}= 2'd1;
        #10; {a,b}= 2'd2;
        #10; {a,b}= 2'd3;
        #30;
        $finish;

    end

    initial
    begin

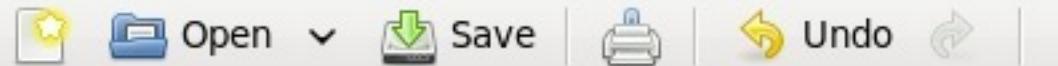
        $monitor("Time=%t a=%b b=%b sum=%b cout=%b",$time,a,b,sum,cout);

    end
endmodule
```





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full_adder_ha.v X

```
module full_adder_ha(a,b,cin,sum,cout);

    input a,b,cin;
    output sum,cout;
    wire [2:0]w;

    half_adder_g HA1(a,b,w[0],w[1]);
    half_adder_g HA2(w[0],cin,sum,w[2]);
    or_01(cout,w[1],w[2]);
endmodule
```

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Console

File Edit View Simulation Windows Help

| Text Search: |

| | | | | 80ns + 0 |

ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm full_adder_ha_tb.a full_adder_ha_tb.b full_adder_ha_tb.cin full_adder_ha_tb.cout full_adder_ha_tb.sum
Created probe 1
ncsim> run
Time= 0 a=0 b=0 cin=0 sum=0 cout=0
Time= 10 a=0 b=0 cin=1 sum=1 cout=0
Time= 20 a=0 b=1 cin=0 sum=1 cout=0
Time= 30 a=0 b=1 cin=1 sum=0 cout=1
Time= 40 a=1 b=0 cin=0 sum=1 cout=0
Time= 50 a=1 b=0 cin=1 sum=0 cout=1
Time= 60 a=1 b=1 cin=0 sum=0 cout=1
Time= 70 a=1 b=1 cin=1 sum=1 cout=1
Simulation complete via \$finish(1) at time 80 NS + 0
. ./full_adder_ha_tb.v:26 \$finish;
ncsim> n



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full_adder_ha_tb.v

```
module full_adder_ha_tb();

    reg a,b,cin;
    wire sum,cout;

    full_adder_ha FA1(a,b,cin,sum,cout);

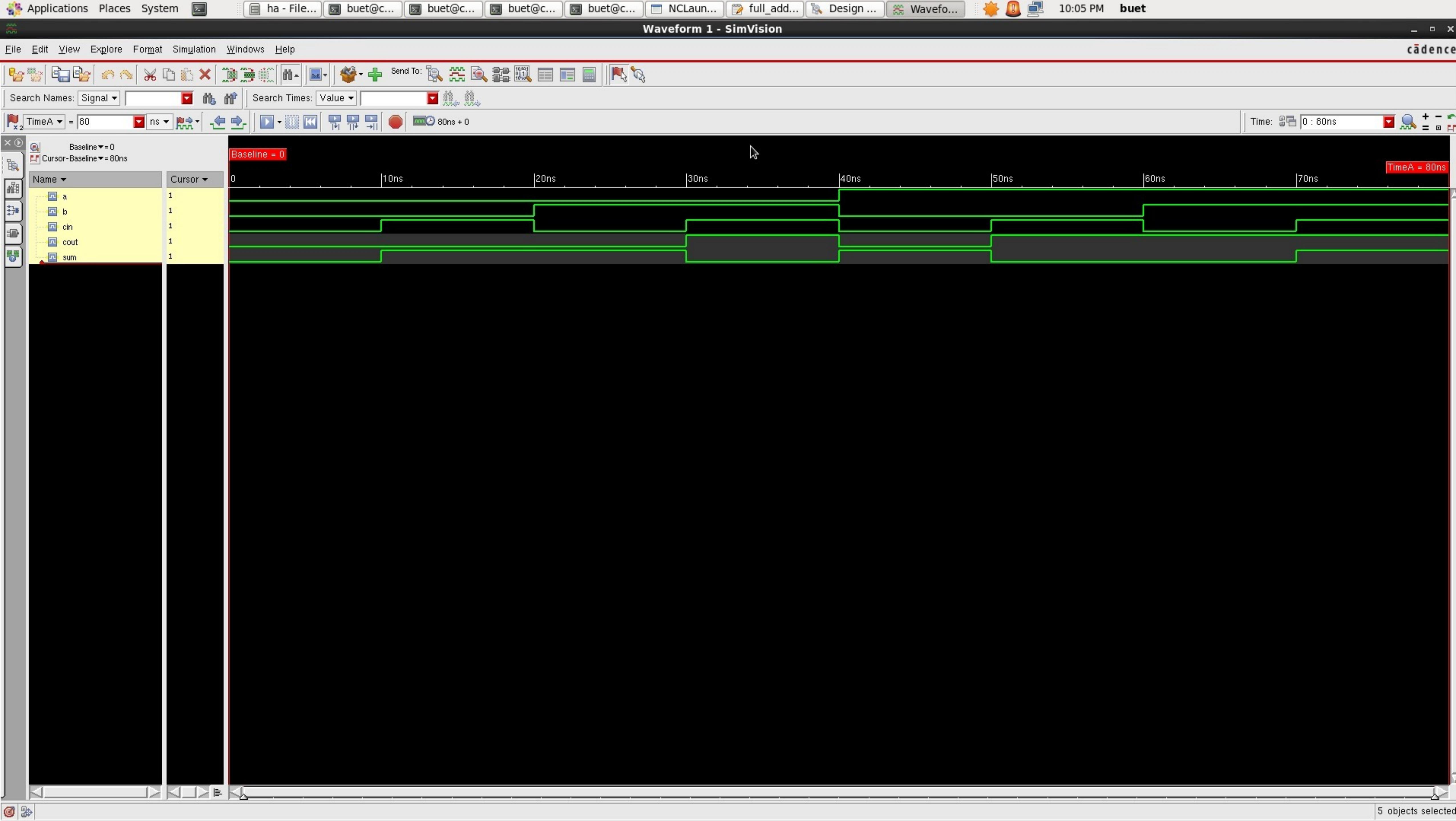
    initial
    begin

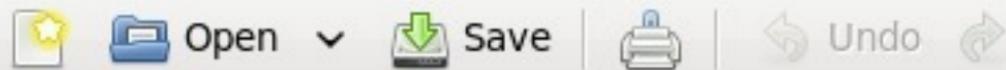
        $monitor("Time=%t a=%b b=%b cin=%b sum=%b cout=%b",$time,a,b,cin,sum,cout);

    end
    initial
    begin

        #0; {a,b,cin}=3'd0;
        #10; {a,b,cin}=3'd1;
        #10; {a,b,cin}=3'd2;
        #10; {a,b,cin}=3'd3;
        #10; {a,b,cin}=3'd4;
        #10; {a,b,cin}=3'd5;
        #10; {a,b,cin}=3'd6;
        #10; {a,b,cin}=3'd7;
        #10;
        $finish;

    end
endmodule
```





half_subtractor_g.v

```
module half_subtractor_g(a,b,diff,bout);

    input a,b;
    output diff,bout;
    wire w;

    xor X1(diff,a,b);
    not N1(w,a);
    and A1(bout,w,b);

endmodule
```

Applications Places System [buet...][Design...][buet...][buet...][g - Fil...][buet@...]

File Edit View Simulation Windows Help

[Text Search:]

[60ns + 0]

```
ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm half_subtractor_tb_g.a half_subtractor_tb_g.b half_subtractor_tb_g.bout half_subtractor_tb_g.diff
Created probe 1
ncsim> run
Time= 0 a=0 b=0 diff=0 bout=0
Time= 10 a=0 b=1 diff=1 bout=1
Time= 20 a=1 b=0 diff=1 bout=0
Time= 30 a=1 b=1 diff=0 bout=0
Simulation complete via $finish(1) at time 60 NS + 0
./half_subtractor_g_tb.v:16 $finish;
ncsim>
```



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half_subtractor_g_tb.v

```
module half_subtractor_tb_g();

    reg a,b;
    wire diff,bout;

    half_subtractor_g HS1(a,b,diff,bout);

    initial
    begin

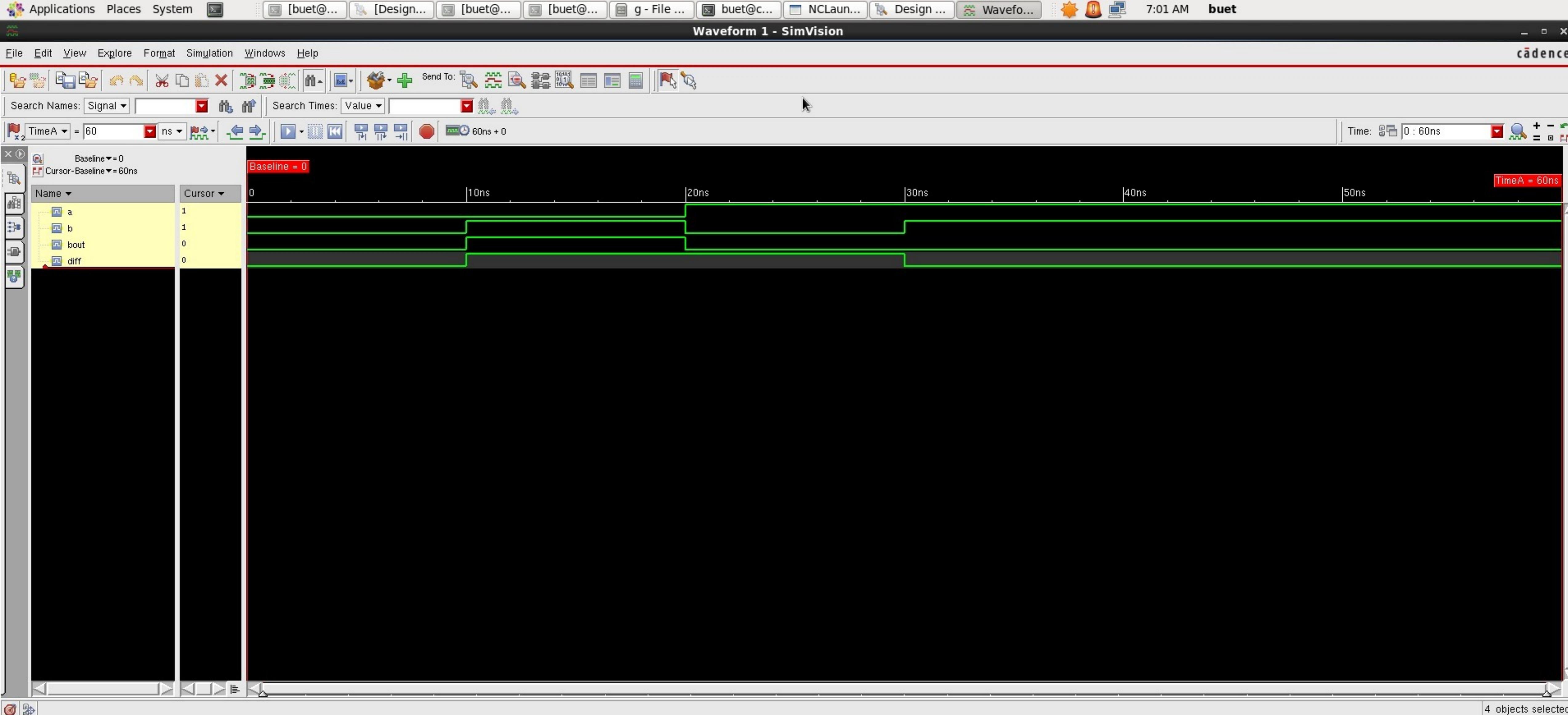
        #0; {a,b}= 2'd0;
        #10; {a,b}= 2'd1;
        #10; {a,b}= 2'd2;
        #10; {a,b}= 2'd3;
        #30;
        $finish;

    end

    initial
    begin

        $monitor("Time=%t a=%b b=%b diff=%b bout=%b",$time,a,b,diff,bout);

    end
endmodule
```



Applications Places System > hs - File Browser

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full_adder_hs.v

```
module full_adder_hs(a,b,cin,sum,cout);

    input a,b,cin;
    output sum,cout;
    wire [4:0]w;

    not N1(w[0],a);
    half_subtractor_g HS1(w[0],b,w[1],w[2]);
    half_subtractor_g HS2(w[1],cin,w[3],w[4]);
    not N2(sum,w[3]);
    or O1(cout,w[2],w[4]);
endmodule
```

Applications Places System hs - File Browser [buet@cadence:... NCLaunch : /ho... Design Browser ...

Console - Si

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| Text Search: |

|

ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm full_adder_hs_tb.a full_adder_hs_tb.b full_adder_hs_tb.cin full_adder_hs_tb.cout full_adder_hs_tb.sum
Created probe 1
ncsim> run
Time= 0 a=0 b=0 cin=0 sum=0 cout=0
Time= 10 a=0 b=0 cin=1 sum=1 cout=0
Time= 20 a=0 b=1 cin=0 sum=1 cout=0
Time= 30 a=0 b=1 cin=1 sum=0 cout=1
Time= 40 a=1 b=0 cin=0 sum=1 cout=0
Time= 50 a=1 b=0 cin=1 sum=0 cout=1
Time= 60 a=1 b=1 cin=0 sum=0 cout=1
Time= 70 a=1 b=1 cin=1 sum=1 cout=1
Simulation complete via \$finish(1) at time 80 NS + 0
. ./full_adder_hs_tb.v:26 \$finish;
ncsim>



full_adder_hs_tb.v

```
module full_adder_hs_tb();

    reg a,b,cin;
    wire sum,cout;

    full_adder_hs FA1(a,b,cin,sum,cout);

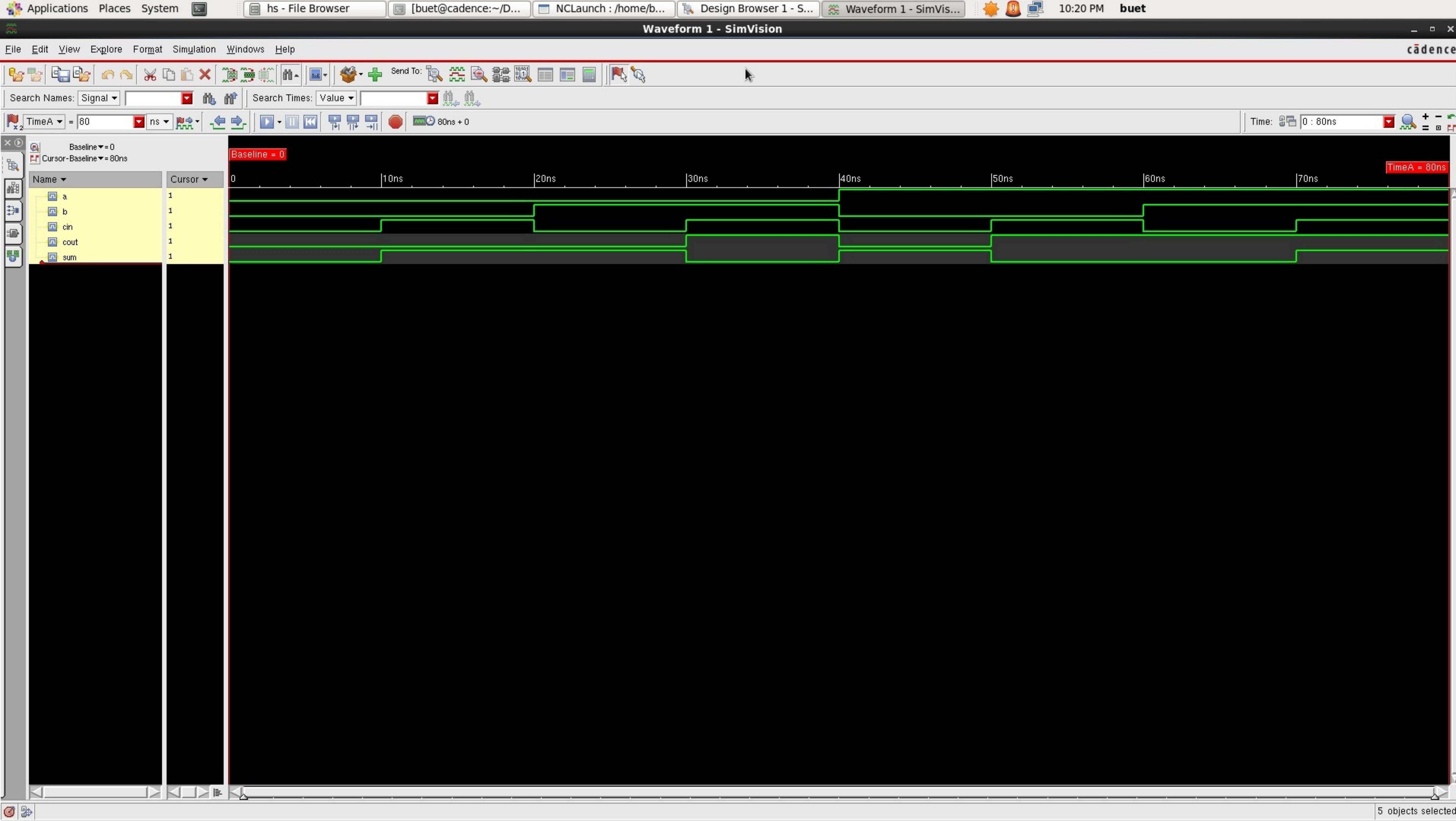
    initial
    begin

        $monitor("Time=%t a=%b b=%b cin=%b sum=%b cout=%b",$time,a,b,cin,sum,cout);

    end
    initial
    begin

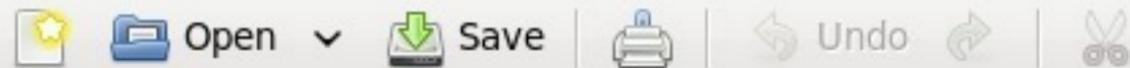
        #0; {a,b,cin}=3'd0;
        #10; {a,b,cin}=3'd1;
        #10; {a,b,cin}=3'd2;
        #10; {a,b,cin}=3'd3;
        #10; {a,b,cin}=3'd4;
        #10; {a,b,cin}=3'd5;
        #10; {a,b,cin}=3'd6;
        #10; {a,b,cin}=3'd7;
        #10;
        $finish;

    end
endmodule
```





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half_adder_hs.v X

```
module half_adder_hs(a,b,sum,cout);

    input a,b;
    output sum,cout;
    wire [1:0]w;

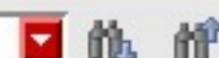
    not N1(w[0],b);
    half_subtractor_g HA1(a,w[0],w[1],cout);
    not N2(sum,w[1]);
endmodule
```



File Edit View Simulation Windows Help



Text Search:



```
ncsim>
ncsim> database -open waves -into waves.shm -default
Created default SHM database waves
ncsim> probe -create -shm half_adder_tb_hs.a half_adder_tb_hs.b half_adder_tb_hs.cout half_adder_tb_hs.sum
Created probe 1
ncsim> run
Time=          0 a=0 b=0 sum=0 cout=0
Time=         10 a=0 b=1 sum=1 cout=0
Time=         20 a=1 b=0 sum=1 cout=0
Time=         30 a=1 b=1 sum=0 cout=1
Simulation complete via $finish(1) at time 60 NS + 0
./half_adder_tb_hs.v:16      $finish;
ncsim>
```



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half_adder_tb_hs.v

```
module half_adder_tb_hs();

    reg a,b;
    wire sum,cout;

    half_adder_hs HA1(a,b,sum,cout);

    initial
    begin

        #0; {a,b}= 2'd0;
        #10; {a,b}= 2'd1;
        #10; {a,b}= 2'd2;
        #10; {a,b}= 2'd3;
        #30;
        $finish;

    end

    initial
    begin

        $monitor("Time=%t a=%b b=%b sum=%b cout=%b",$time,a,b,sum,cout);

    end
endmodule
```

Waveform 1 - SimVision

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