Digital Design and Computer Organization Laboratory

3rd Semester, Academic Year 2024

Date: 09/08/2024

Name: Rithvik Rajesh Matta	SRN: PES2UG23CS485	Section: H

Week#____1_____ Program Number: ____1___

TITLE: WRITE A VERILOG PROGRAM TO MODEL A TWO INPUT AND GATE. GENERATE THE VVP OUTPUT AND SIMULATION WAVEFORM USING GTKWAVE. VERIFY THE OUTPUT AND WAVEFORM WITH THE AND GATE TRUTH TABLE

I. Verilog Code Screenshot
II. Verilog VVP Output Screen Shot
III. GTKWAVE Screenshot
IV. Output Table to be completed and included

AND Gate

Code:

and2.v

```
1  module andgate (y,a, b,);
2  input a, b;
3  output y;
4  assign y = a & b;
5  endmodule
6
```

and2_tb.v

```
1   module and_test;
2   reg a,b;
3   wire y;
4   and(y,a,b);
5   initial
6   begin
7   #0 a=0;b=0;
8   #5 a=0;b=1;
9   #10 a=1;b=0;
10  #15 a=1;b=1;
11  end
12  initial
13  begin
14  $monitor($time,"a=%b,b=%b,y=%b",a,b,y);
15  end
16  initial
17  begin
18  $dumpfile("and2_test.vcd");
19  $dumpvars(0,and_test);
20  end
21  endmodule
```

Output:

```
rithvikmatta@penguin:~/DDCO-sem-3$ iverilog -o test1 and2.v and2_tb.v
rithvikmatta@penguin:~/DDCO-sem-3$ vvp test1
VCD info: dumpfile and2_test.vcd opened for output.
                  0a=0,b=0,y=0
                  5a=0,b=1,y=0
                 15a=1,b=0,y=0
                 30a=1,b=1,y=1
rithvikmatta@penguin:~/DDCO-sem-3$ gtkwave and2_test.vcd

GTKWave Analyzer v3.3.118 (w)1999-2023 BSI

[0] start time.
[30] end time.
GTKWAVE | Touch screen detected, enabling gestures.
Exiting.
```

GTK wave screenshot:

Output table:

A	B	C
0	0	0
0	1	0
1	0	0
1	1	1

WRITE A VERILOG PROGRAM TO MODEL A TWO INPUT OR GATE. GENERATE THE VVP OUTPUT AND SIMULATION WAVEFORM USING GTKWAVE. VERIFY THE OUTPUT AND WAVEFORM WITH THE OR GATE TRUTH TABLE

I. Verilog Code Screenshot
II. Verilog VVP Output Screen Shot
III. GTKWAVE Screenshot
IV. Output Table to be completed and included

OR Gate

Code:

or2.v

```
1   module orgate (y,a, b,);
2   input a, b;
3   output y;
4   assign y = a | b;
5   endmodule
6
```

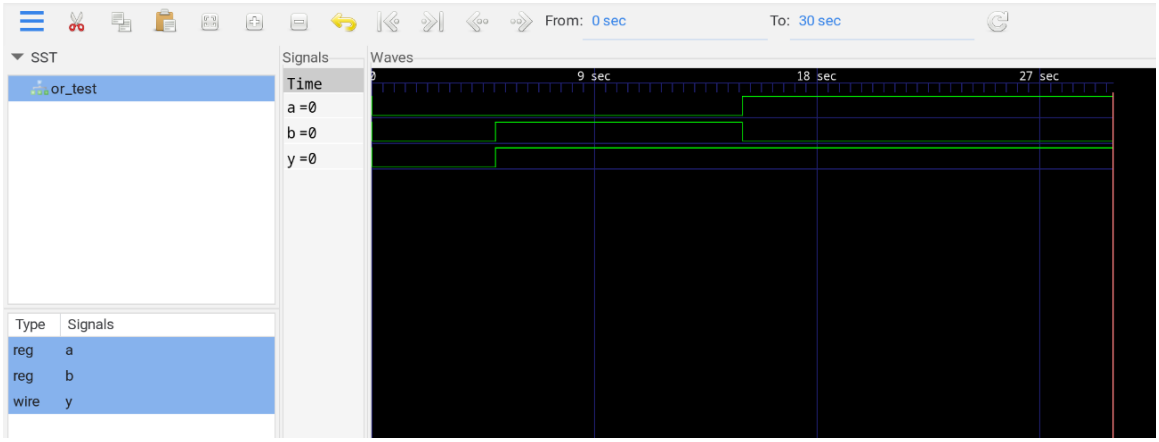
or2_tb.v

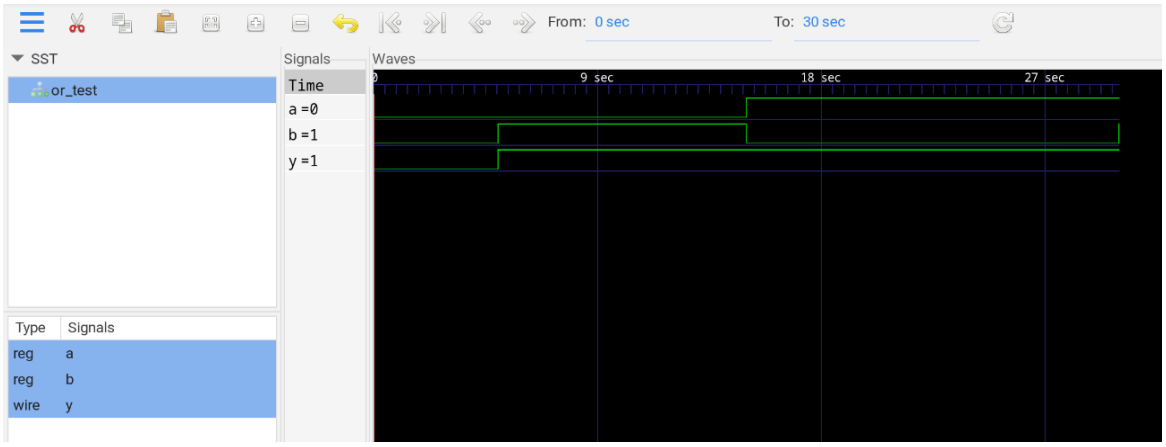
```
1   module or_test;
2   reg a,b;
3   wire y;
4   or(y,a,b);
5   initial
6   begin
7   #0 a=0;b=0;
8   #5 a=0;b=1;
9   #10 a=1;b=0;
10  #15 a=1;b=1;
11  end
12  initial
13  begin
14  $monitor($time,"a=%b,b=%b,y=%b",a,b,y);
15  end
16  initial
17  begin
18  $dumpfile("or2_test.vcd");
19  $dumpvars(0,or_test);
20  end
21  endmodule
```

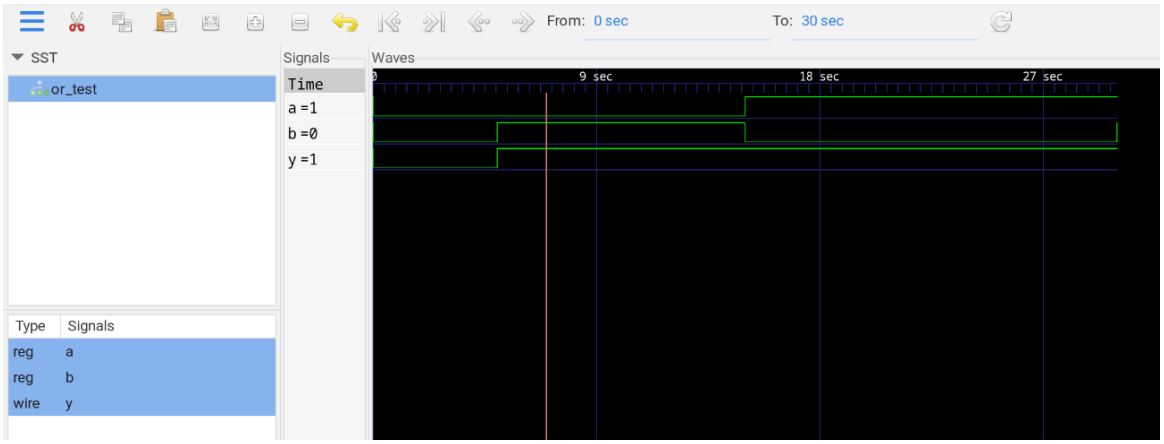
Output:

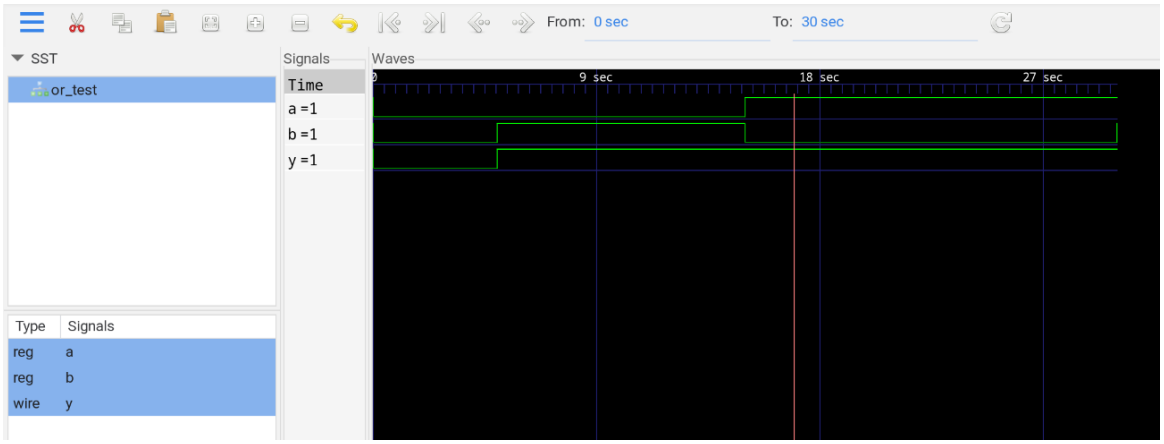
```
rithvikmatta@penguin:~/DDCO-sem-3$ iverilog -o test2 or2.v or2_tb.v
rithvikmatta@penguin:~/DDCO-sem-3$ vvp test2
VCD info: dumpfile or2_test.vcd opened for output.
                  0a=0,b=0,y=0
                  5a=0,b=1,y=1
                 15a=1,b=0,y=1
                 30a=1,b=1,y=1
rithvikmatta@penguin:~/DDCO-sem-3$ gtkwave or2_test.vcd

GTKWave Analyzer v3.3.118 (w)1999-2023 BSI

[0] start time.
[30] end time.
GTKWAVE | Touch screen detected, enabling gestures.
Exiting.
```

GTK wave screenshot:









Output table:

A	B	C
0	0	0
0	1	1
1	0	1
1	1	1

WRITE A VERILOG PROGRAM TO MODEL A ONE INPUT NOT GATE. GENERATE THE VVP OUTPUT AND SIMULATION WAVEFORM USING GTKWAVE. VERIFY THE OUTPUT AND WAVEFORM WITH THE NOT GATE TRUTH TABLE

I. Verilog Code Screenshot
II. Verilog VVP Output Screen Shot
III. GTKWAVE Screenshot
IV. Output Table to be completed and included

NOT Gate

Code:

not2.v

```
1   module andgate (y,a, );
2   input a;
3   output y;
4   assign y = !a;
5   endmodule
6
```

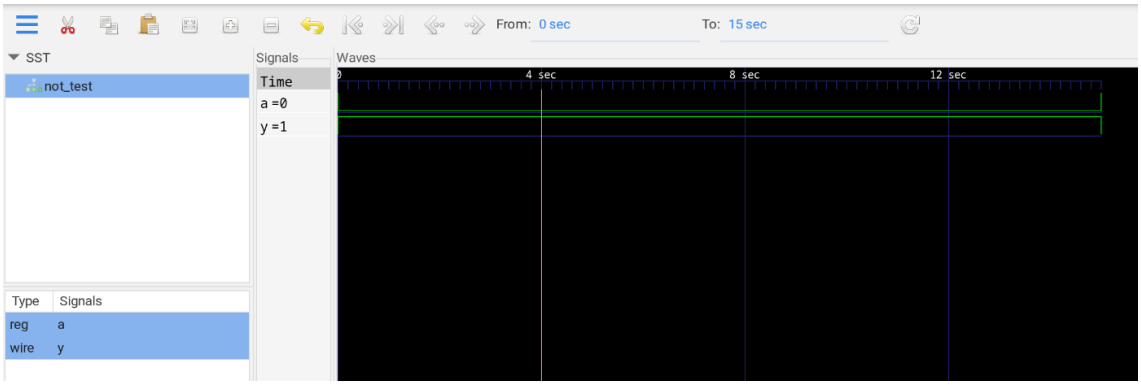
not2_tb.v

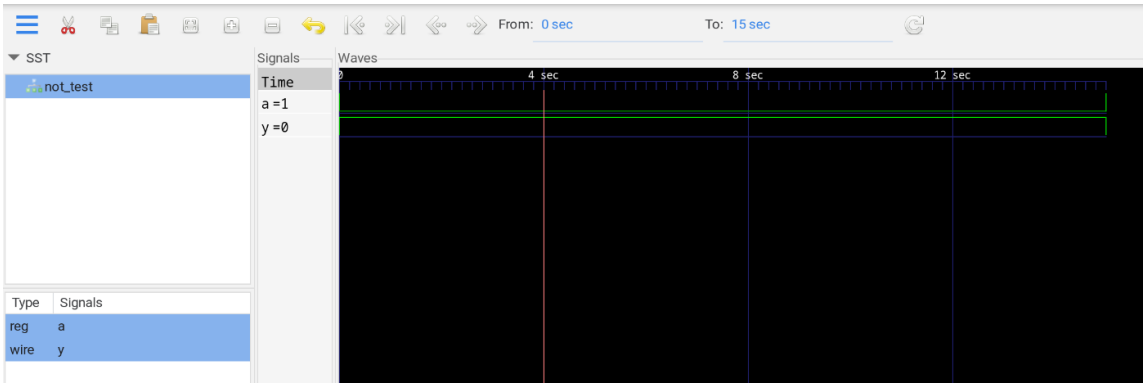
```
1   module not_test;
2   reg a;
3   wire y;
4   not(y,a);
5   initial
6   begin
7   #0 a=0;
8   #15 a=1;
9   end
10  initial
11  begin
12  $monitor($time,"a=%b,y=%b",a,y);
13  end
14  initial
15  begin
16  $dumpfile("not2_test.vcd");
17  $dumpvars(0,not_test);
18  end
19  endmodule
```

Output:

```
rithvikmatta@penguin:~/DDCO-sem-3$ iverilog -o test3 not2.v not2_tb.v
rithvikmatta@penguin:~/DDCO-sem-3$ vvp test3
VCD info: dumpfile not2_test.vcd opened for output.
                  0a=0,y=1
                 15a=1,y=0
rithvikmatta@penguin:~/DDCO-sem-3$ gtkwave not2_test.vcd

GTKWave Analyzer v3.3.118 (w)1999-2023 BSI

[0] start time.
[15] end time.
GTKWAVE | Touch screen detected, enabling gestures.
Exiting.
```

GTK wave screenshot:

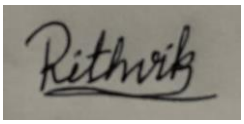




Output table:

A	Y
0	1
1	0

If found plagiarized, I will abide with the disciplinary action of the University.

Signature: 

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