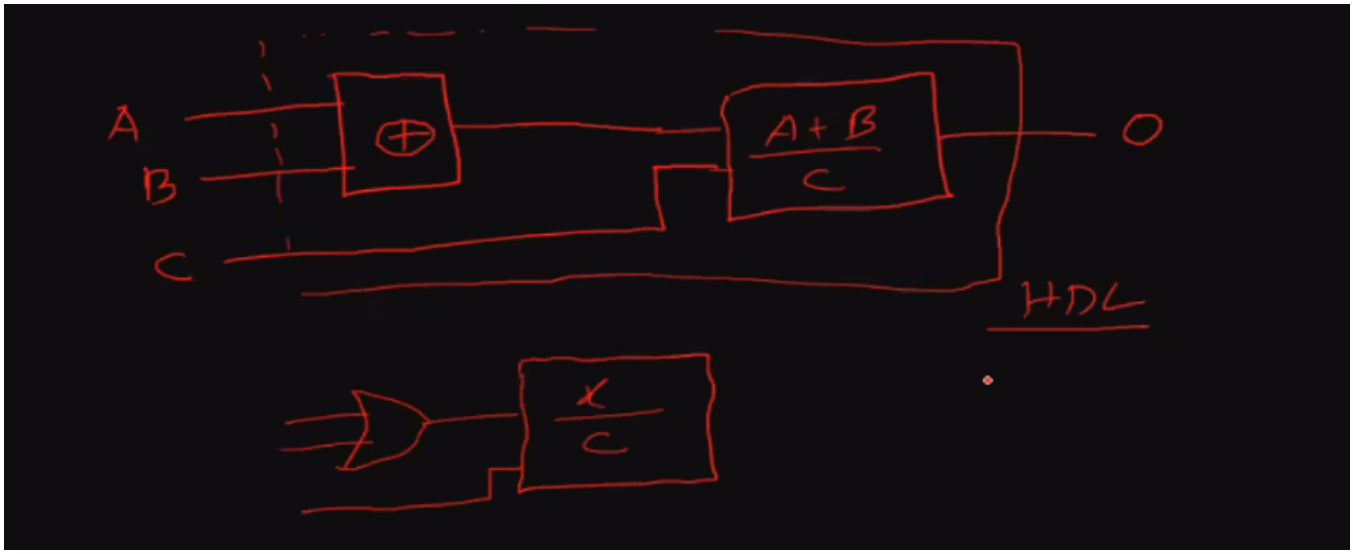
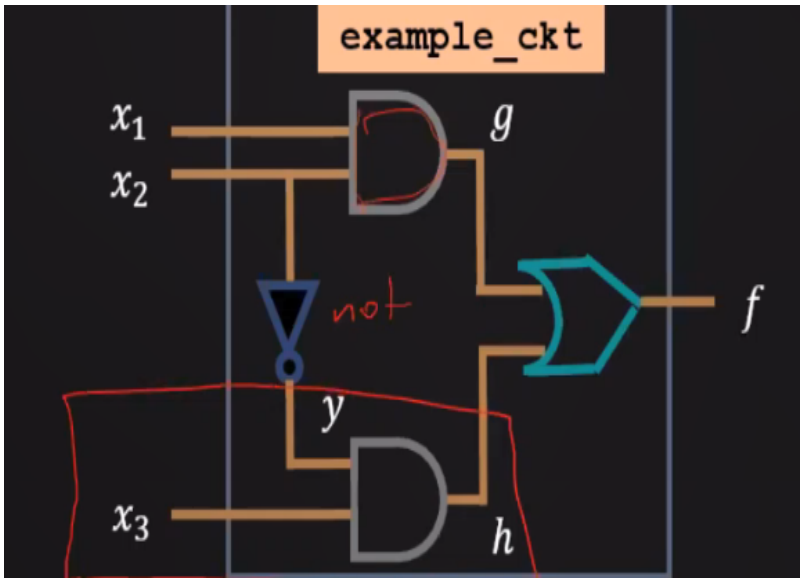


input A,B,C;
output O;
wire x;(x is an internal variable here)
1 OR gate(2 input)=6 MOSFET
1 AND gate(3 input)=8 MOSFET
1 NOT gate=2 MOSFET

```
module example_ckt(f, x1, x2, x3);

    input x1, x2, x3;
    output f;

    assign g = x1 & x2;
    assign y = ~x2;
    assign h = y & x3;
    assign f = g | h;

endmodule
```

1's complement
Bitwise OR

$$f = x_1 \cdot x_2 + \overline{x_2} \cdot x_3$$



x1	x2	x3	f
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1

How to work on quartus

File>New Project Wizard>Select Directory>Select Name>Next>Next>
family=FLEX10KE>Next>

Design entry: Tool Name=Custom Format=VERILOG HDL

Simulation: Tool Name=Custom Format=VERILOG

Timing Analysis: Tool Name=Custom Format=VERILOG>Next>Finish

File>New>Design file:Verilog HDL file>OK

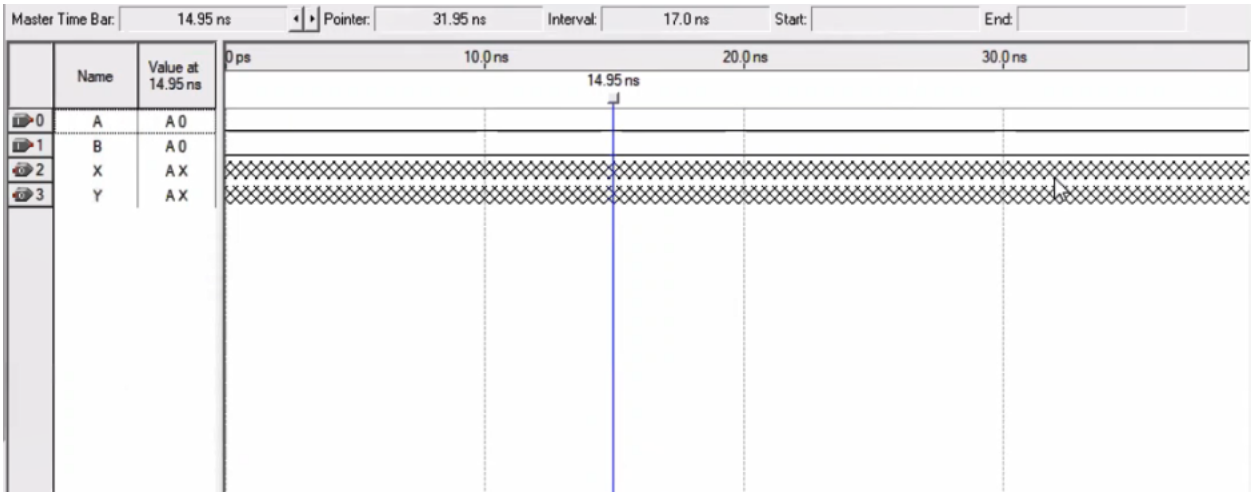
Write your code now

```
1  module ex1(A, B, X, Y);
2      input A, B;
3      output X, Y;
4
5      assign X = A&B;
6      assign Y = A|B;
7
8  endmodule
```

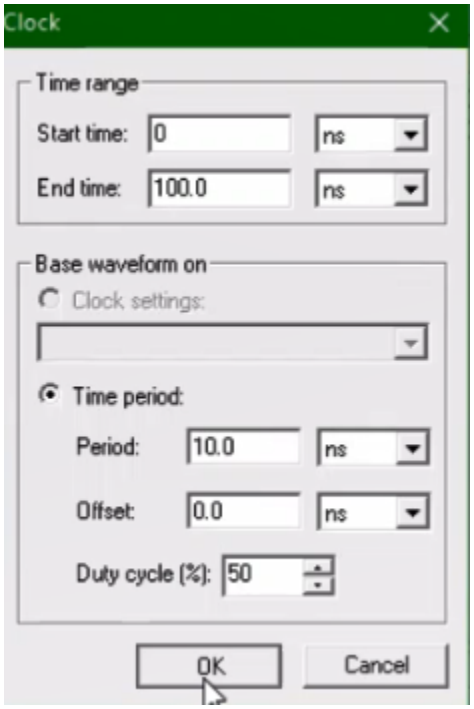
Start compilation button(violet play button)>save changes?yes>save>

To see the output:(waveform output)

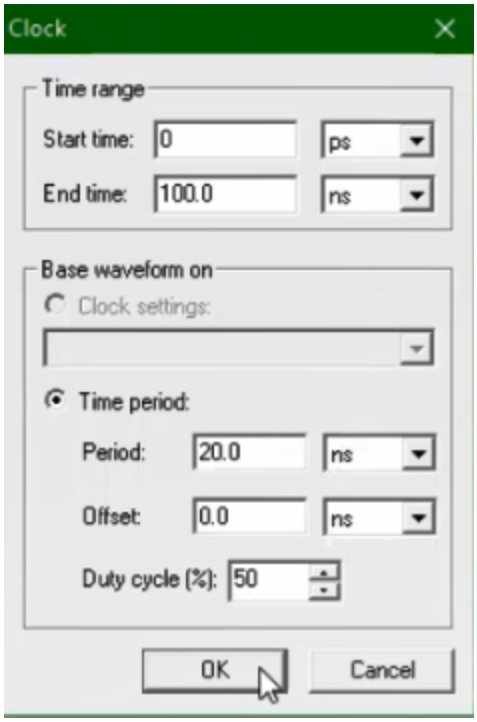
File>New>Verification/Debugging file>Vector Waveform File>Ok>Click right mouse>Insert>Insert Node or Bus>Node Finder>Pins:all>List>Which pins I want to see select them>OK>OK

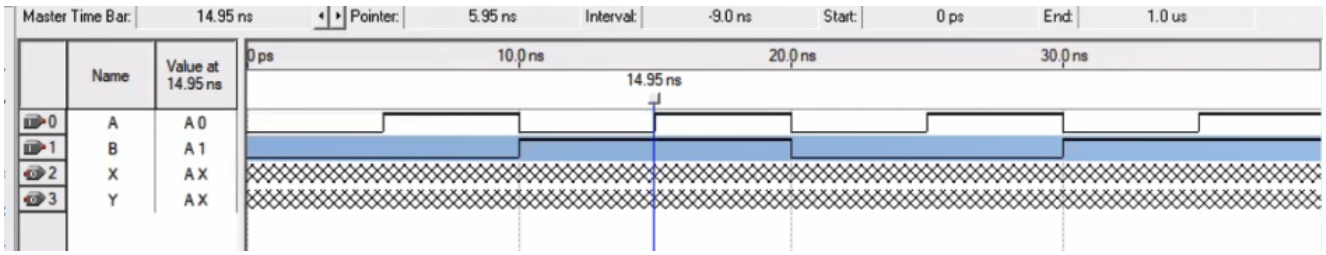


Click right mouse on A>Value>Clock>



Click Right Mouse on B>Value>Clock>





If you want to zoom in or out this picture press CTRL+rotate mouse wheel

Now,we want to see the output:

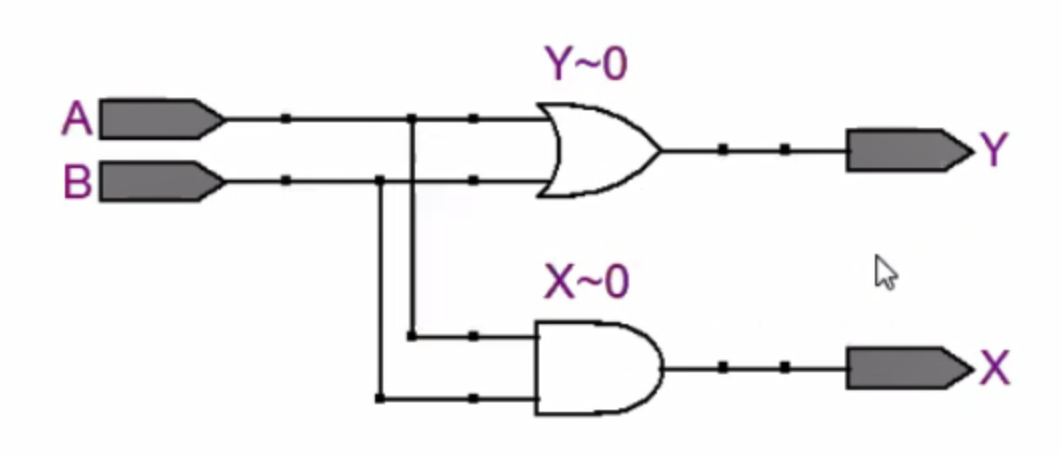
Assignment>Settings>Simulator setting>Simulation Mode>Functional>Ok

Processing>Generate Functional Simulation Netlist>Wanna save?YES>Save>OK

Processing>Start Simulation>Ok

Producing Circuit:(Schematic Diagram)

Tools>Netlist Viewers>RTL Viewer



Operator	Operation
~A	This will produce 1's complement of A
A & B	Bitwise AND
A | B	Bitwise OR
A^B	Bitwise XOR
A+B	Addition of two single or multibit numbers
A-B	Subtraction of two single or multibit numbers
A*B	Multiplication of two single or multibit numbers
A/B	Division of two single or multibit numbers
A%B	This returns the remainder of the integer division A/B