

Q(1):-

(a)

$$X \text{NAND } Y \rightarrow (n) \text{NAND } n \Rightarrow n \text{ bit}$$

$$\text{NOT}(X) \quad \text{NOT} = \Rightarrow n \text{ bit}$$

$$X \text{ NOR } Y \quad (n) \text{NOR}(n) \Rightarrow n \text{ bit}$$

$$X \text{ XOR } Y \quad (n) \text{XOR}(n) \Rightarrow n \text{ bit}$$

$$(X+Y)/2 \Rightarrow (X+Y) \Rightarrow n+1/2 = n+1$$

$$2*(X+Y) \Rightarrow (n+1)*2 = n+2$$

$$(X/2)+Y \Rightarrow n+1 \quad (\text{BY})$$

$$X - (Y/2) \Rightarrow n+1$$

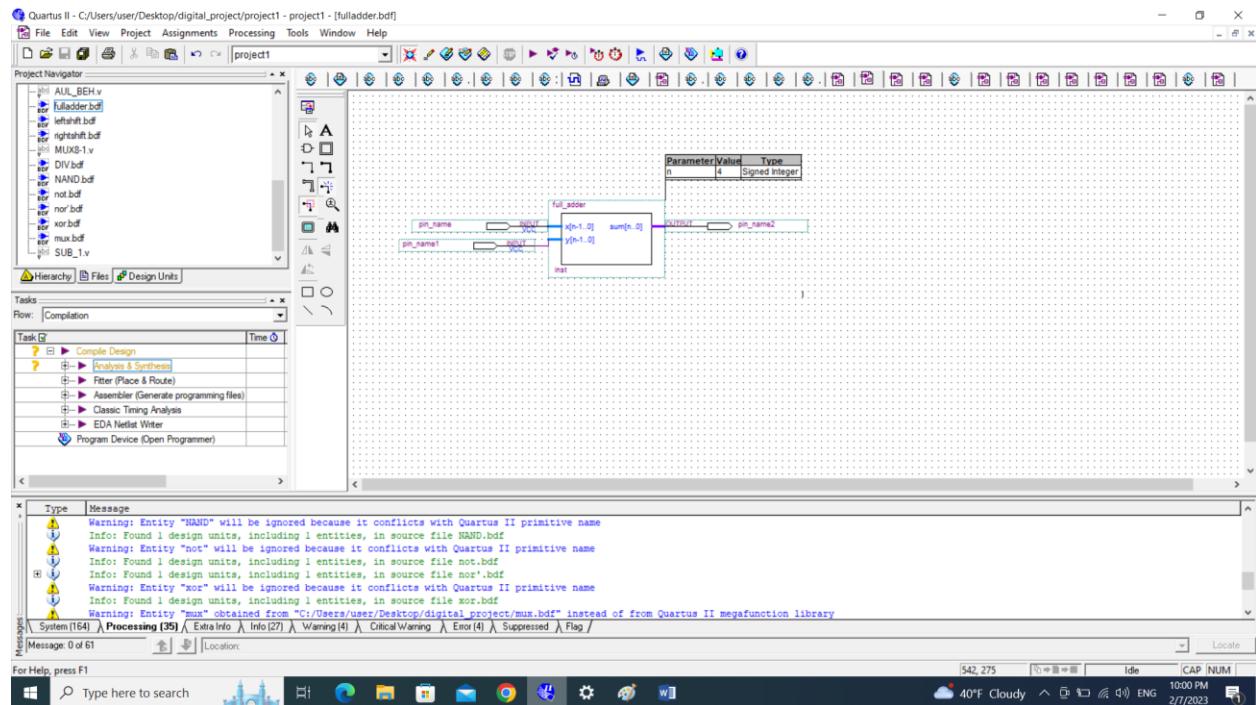
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Q(2):-

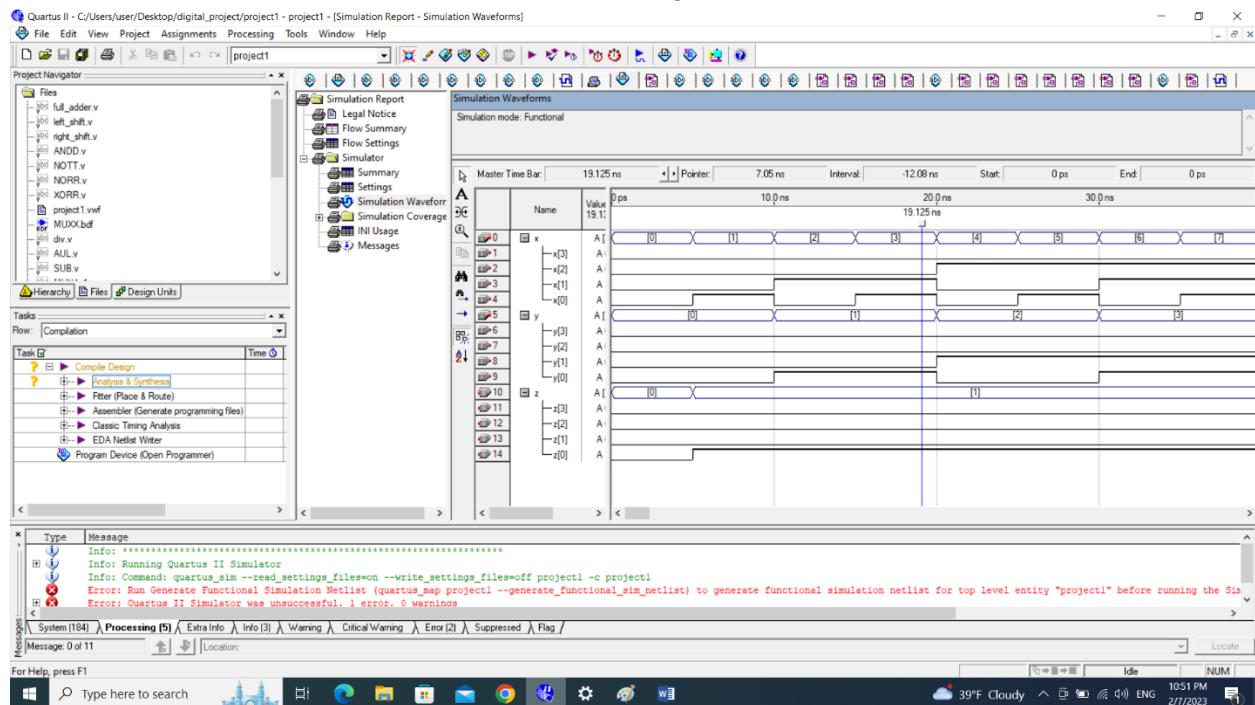
FULL\_ADDER:



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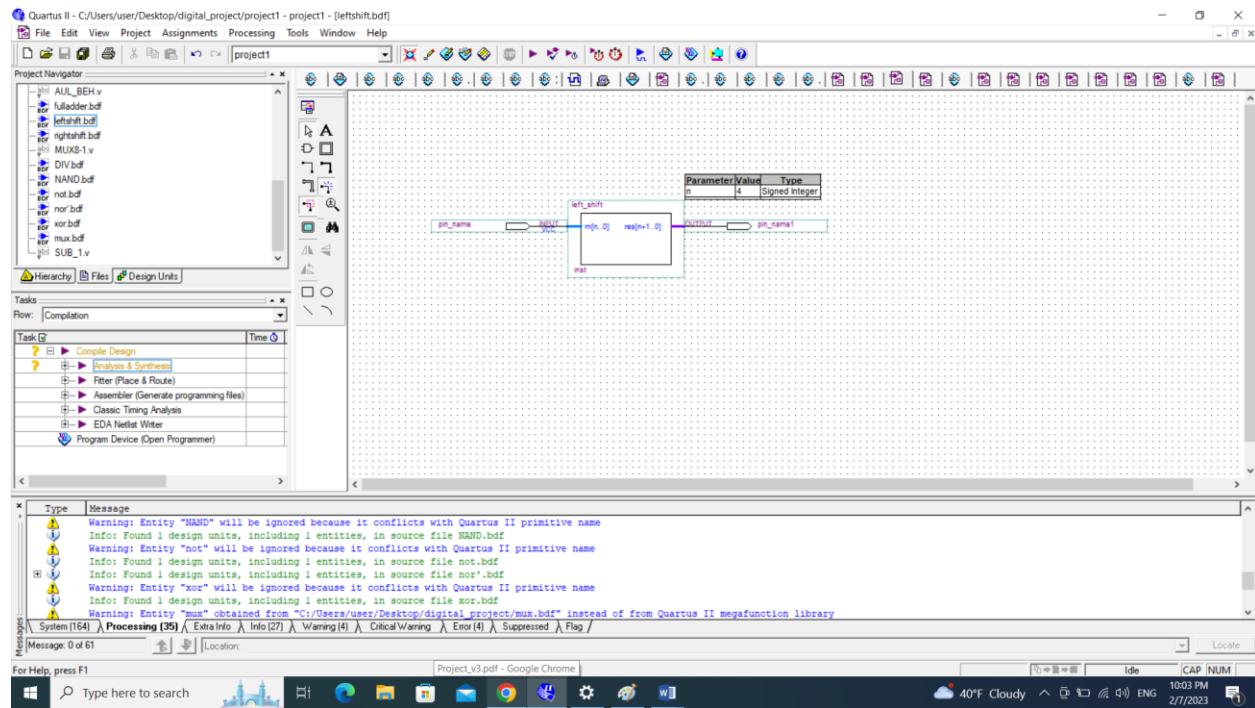


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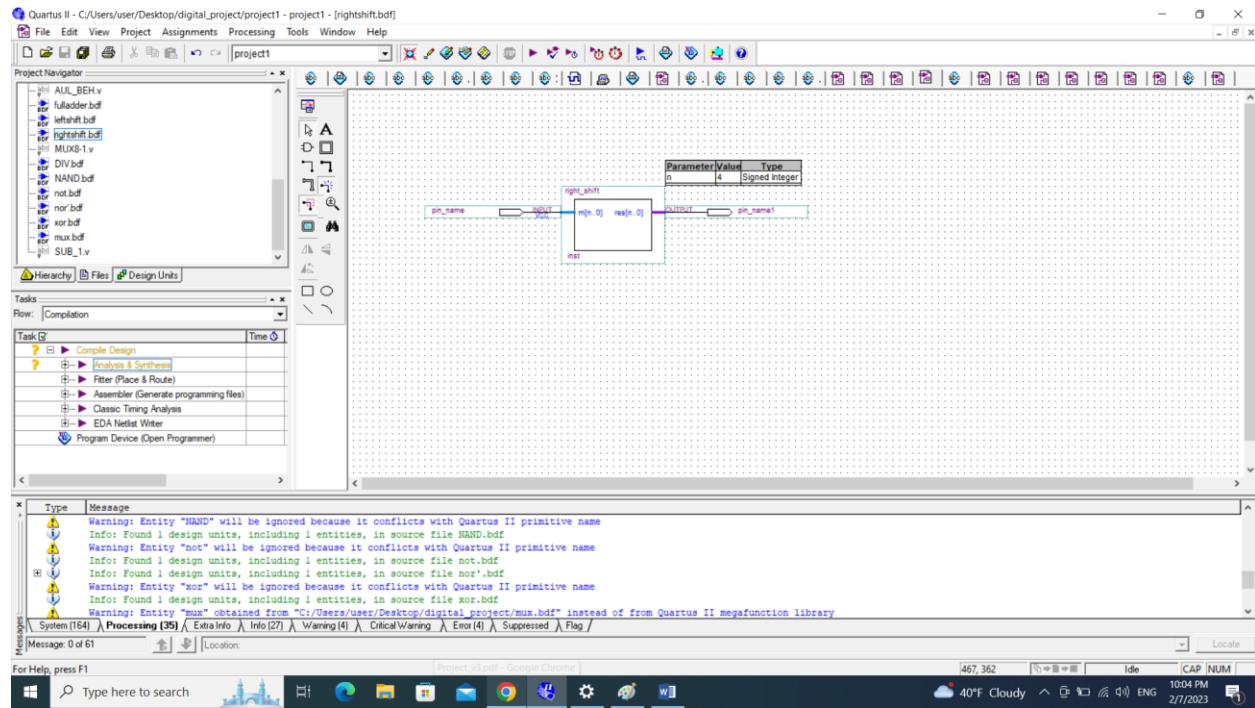
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## LEFT\_SHIFT:



## RIGHT\_SHIFT:

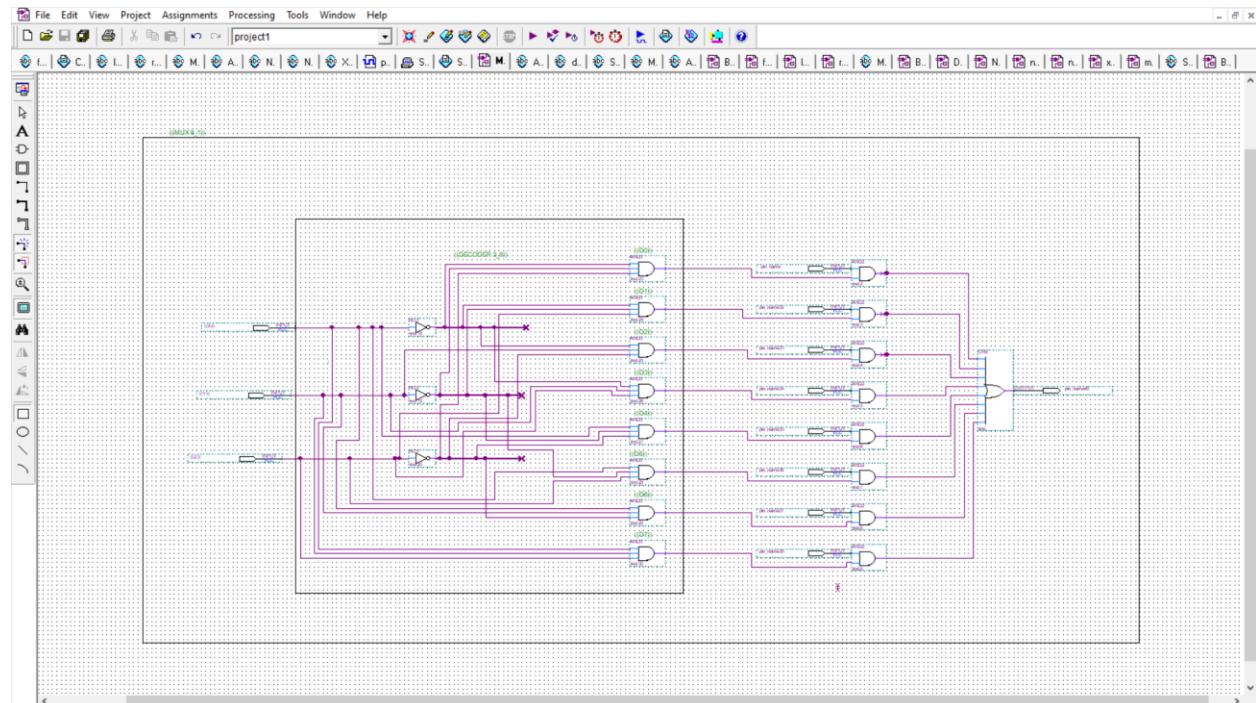
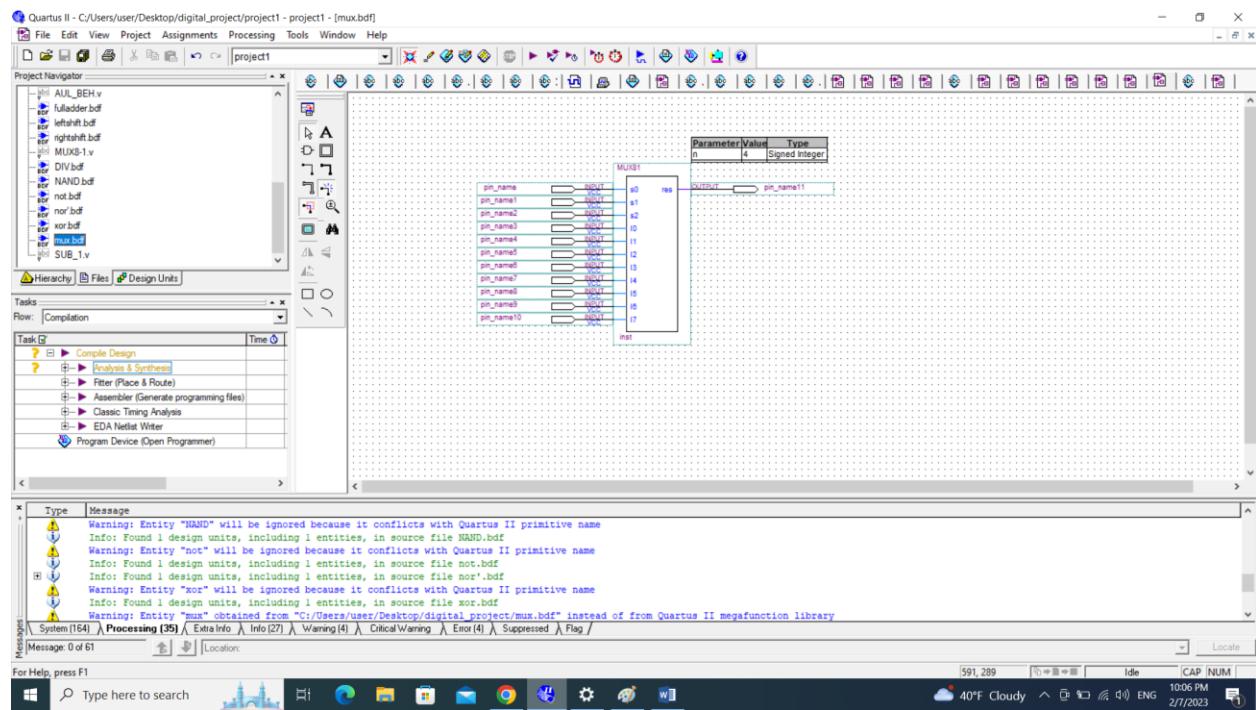


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## MUX8-1:

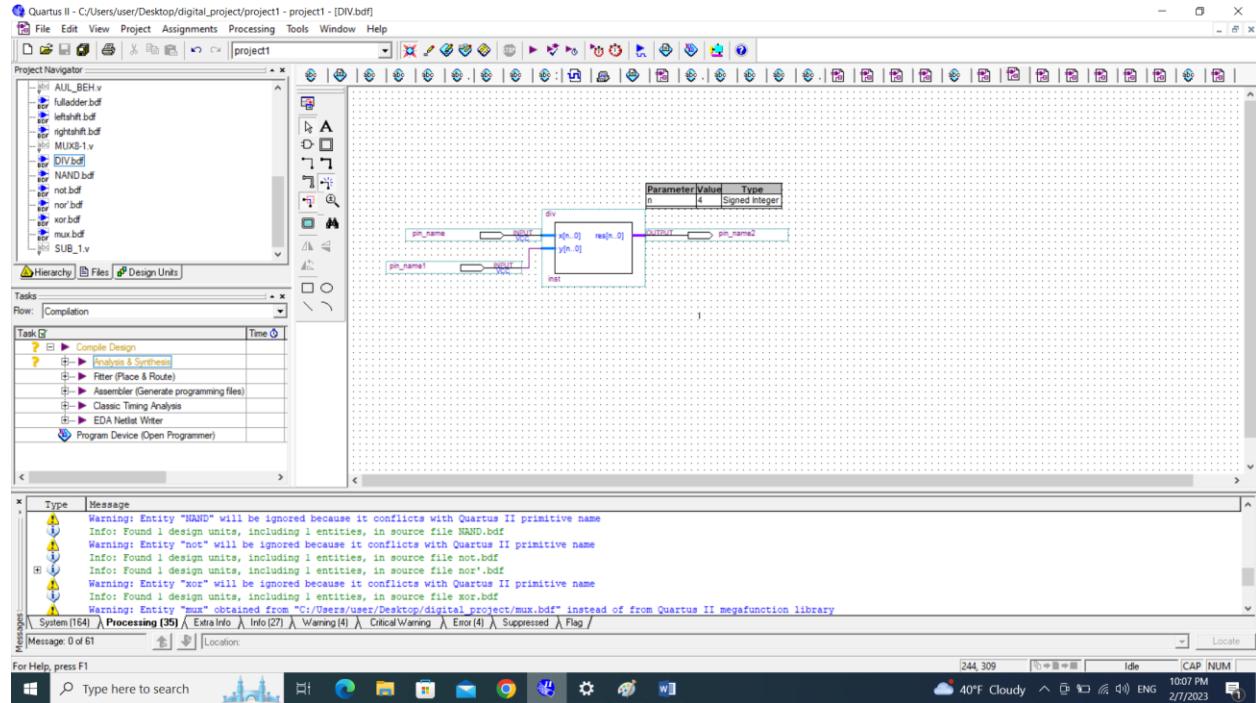


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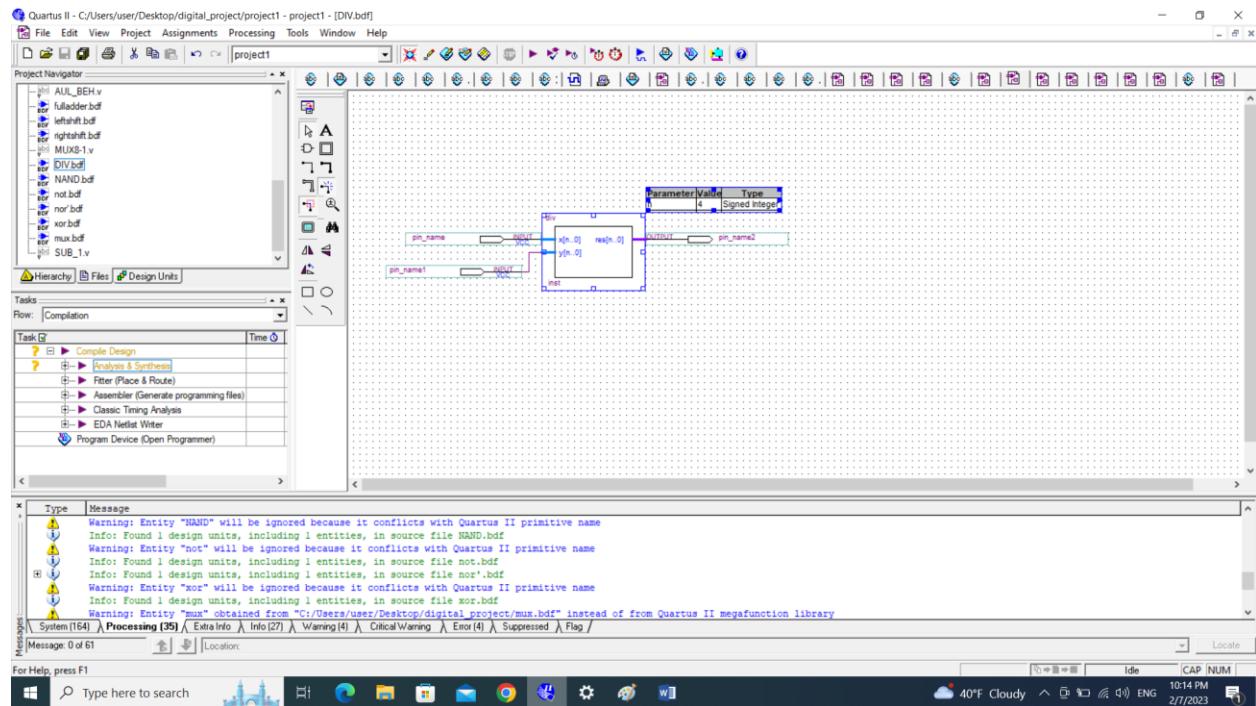
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DIV((X/2)+Y):



SUB((X-(Y/2)):

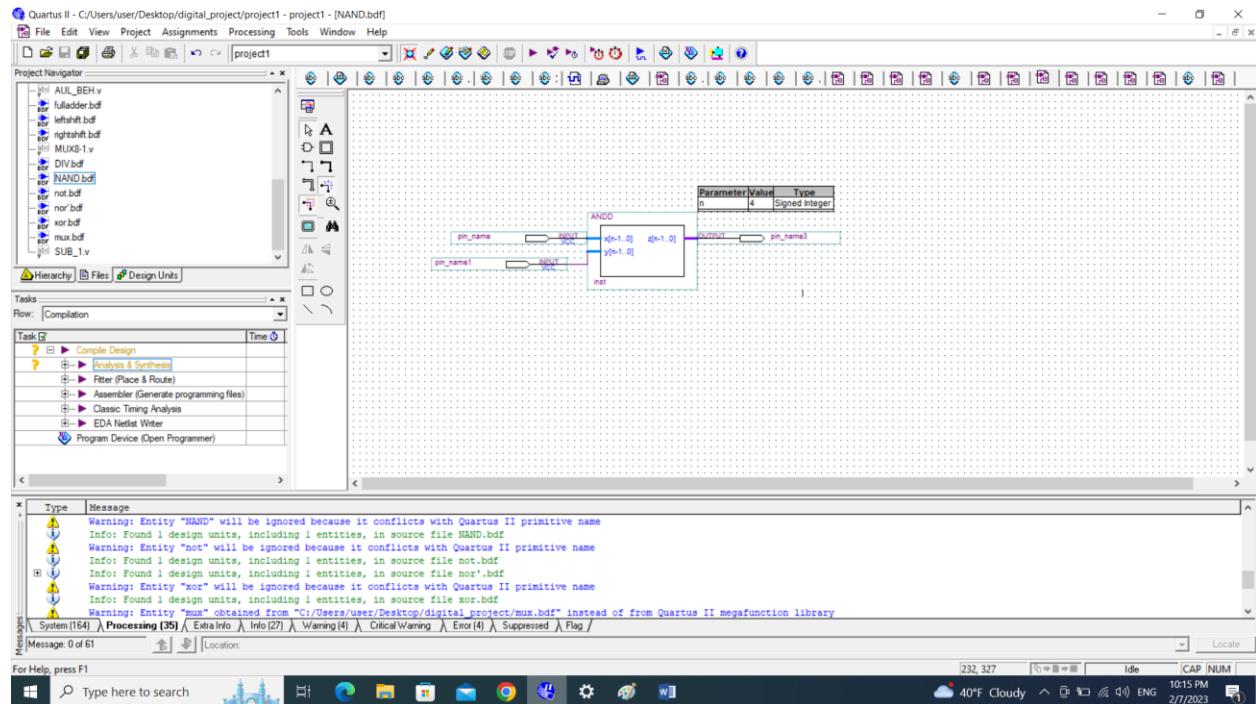


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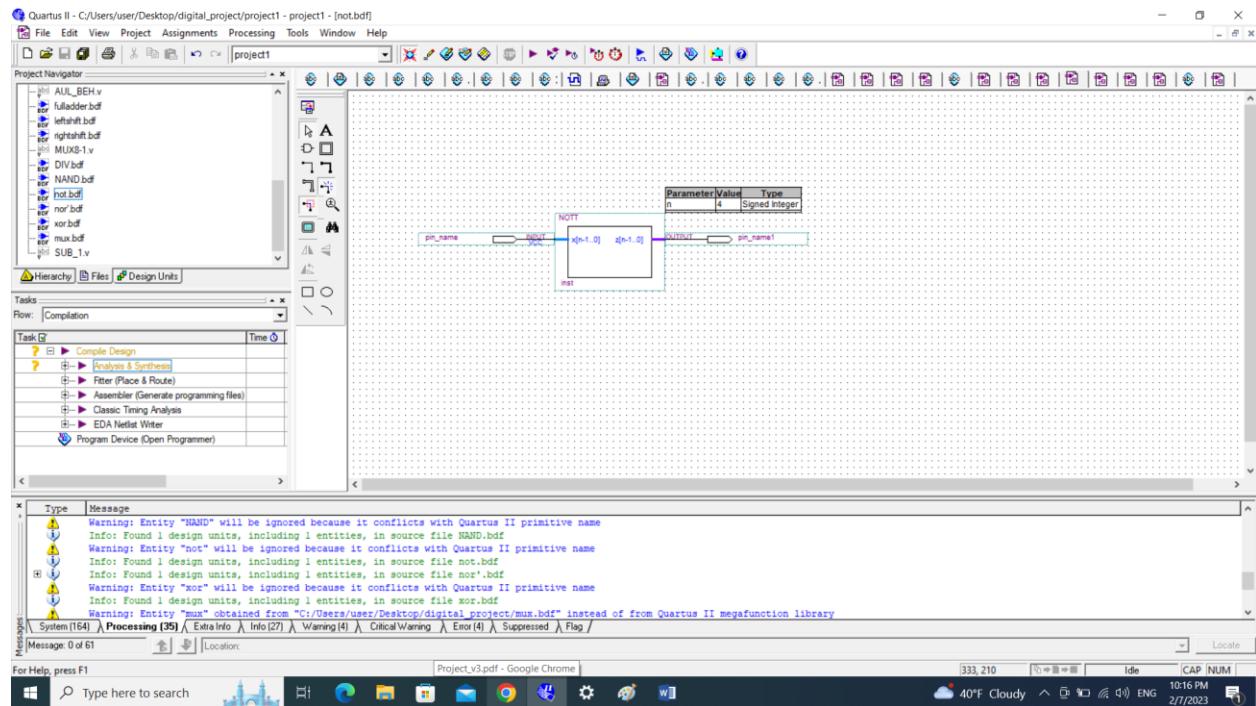
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NAND:



NOT:

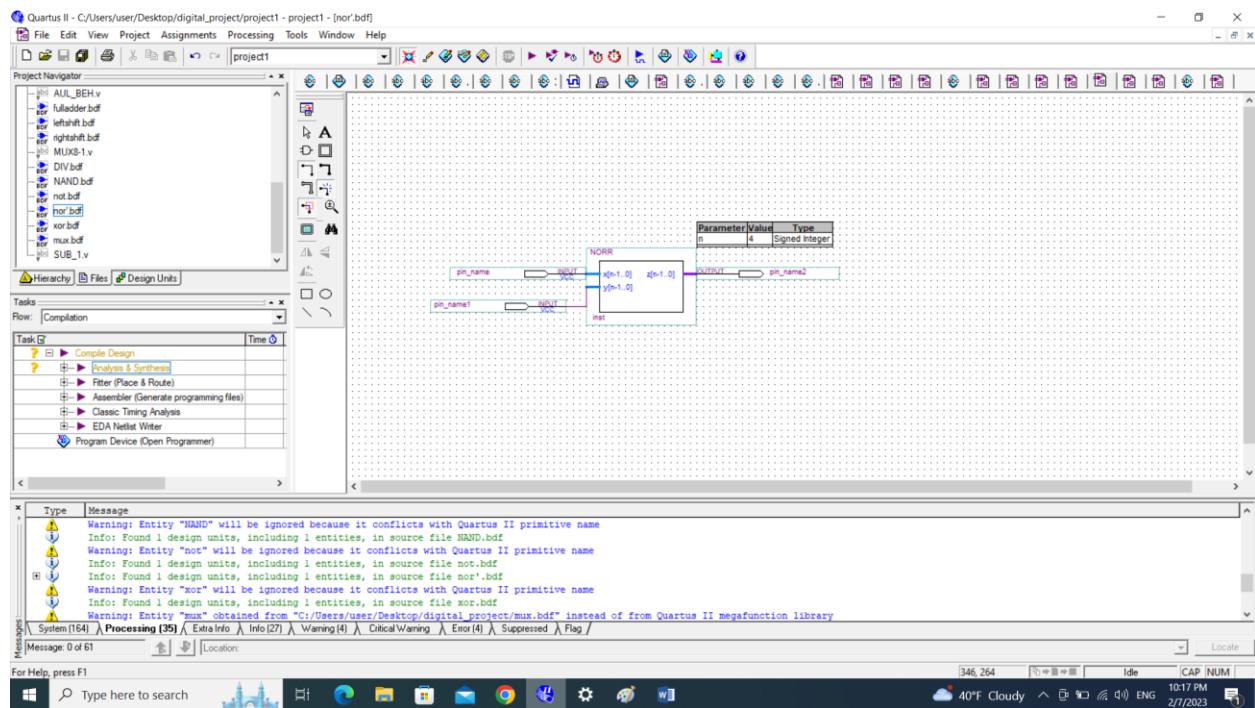


# PROJECT-DIGITAL

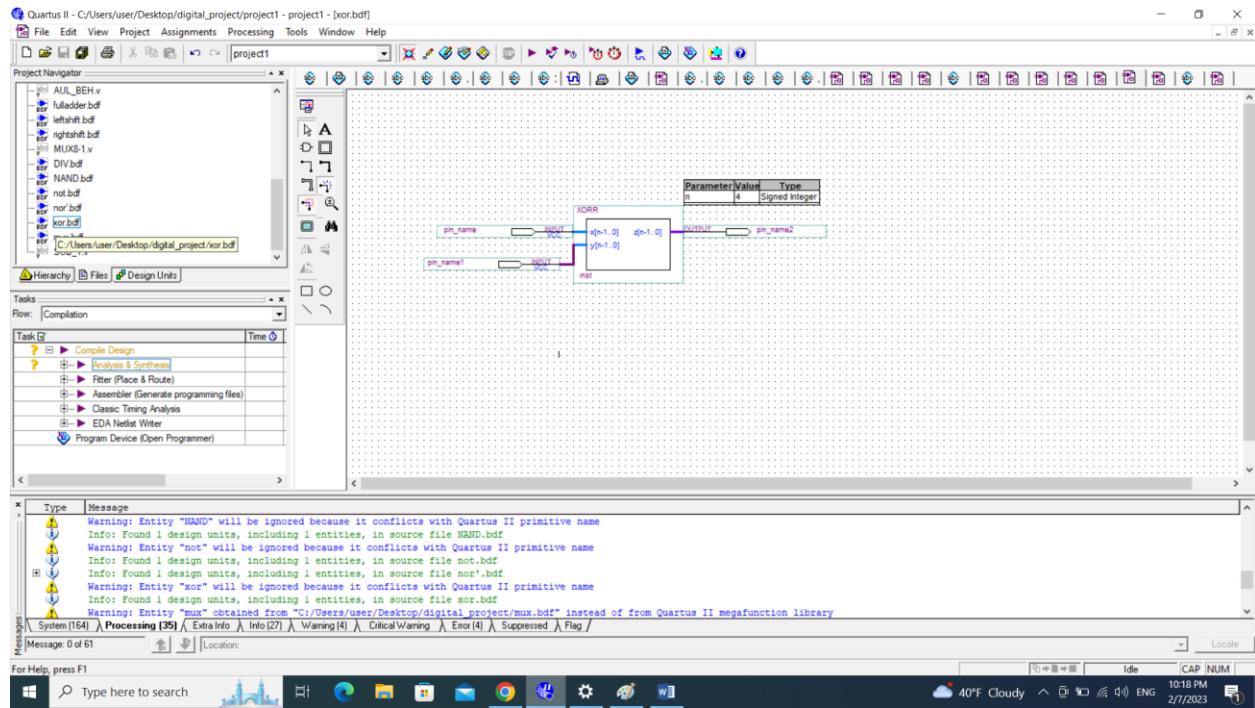
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NOR:



XOR:



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Q(3):

Quartus II - C:/Users/user/Desktop/digital\_project/project1 - project1 - [full\_adder.v]

File Edit View Project Assignments Processing Tools Window Help

Project Navigator

Files

- full\_adder.v
- left\_shift.v
- right\_shift.v
- ANDD.v
- NOTT.v
- NORR.v
- XORR.v
- project1.vwf
- MUXX.bdf
- drv.v
- AUL.v

Hierarchy Files Design Units

Tasks

Row: Compilation

Task G

- Compile Design
- Analysis & Synthesis
- Filter (Place & Route)
- Assembler (Generate programming files)
- Classic Timing Analysis
- EDA Netlist Writer
- Program Device (Open Programmer)

267 268 ab

Type Message

Warning: Entity "NAND" will be ignored because it conflicts with Quartus II primitive name  
Info: Found 1 design units, including 1 entities, in source file NAND.bdf  
Warning: Entity "not" will be ignored because it conflicts with Quartus II primitive name  
Info: Found 1 design units, including 1 entities, in source file not.bdf  
Info: Found 1 design units, including 1 entities, in source file nor.bdf  
Warning: Entity "xor" will be ignored because it conflicts with Quartus II primitive name  
Info: Found 1 design units, including 1 entities, in source file xor.bdf  
Warning: Entity "mux" obtained from "C:/Users/user/Desktop/digital\_project/mux.bdf" instead of from Quartus II megafunction library

System [164] / Processing [39] / Extra Info [ ] / Info [27] / Warning [4] / CriticalWarning [ ] / Error [4] / Suppressed [ ] / Flag [ ]

Message 0 of 61

For Help, press F1 Type here to search 40°F Cloudy 10:19 PM 2/7/2023

Ln 1, Col 26 Idle CAP NUM

Quartus II - C:/Users/user/Desktop/digital\_project/project1 - project1 - [left\_shift.v]

File Edit View Project Assignments Processing Tools Window Help

Project Navigator

Files

- full\_adder.v
- left\_shift.v
- right\_shift.v
- ANDD.v
- NOTT.v
- NORR.v
- XORR.v
- project1.vwf
- MUXX.bdf
- drv.v
- AUL.v

Hierarchy Files Design Units

Tasks

Row: Compilation

Task G

- Compile Design
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Info: Found 1 design units, including 1 entities, in source file nor.bdf  
Warning: Entity "xor" will be ignored because it conflicts with Quartus II primitive name  
Info: Found 1 design units, including 1 entities, in source file xor.bdf  
Warning: Entity "mux" obtained from "C:/Users/user/Desktop/digital\_project/mux.bdf" instead of from Quartus II megafunction library

System [164] / Processing [39] / Extra Info [ ] / Info [27] / Warning [4] / CriticalWarning [ ] / Error [4] / Suppressed [ ] / Flag [ ]

Message 0 of 61

For Help, press F1 Type here to search 40°F Cloudy 10:20 PM 2/7/2023

Ln 6, Col 11 Idle CAP NUM

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Quartus II - C:/Users/user/Desktop/digital\_project/project1 - [left\_shift.v]

```

1 module left_shift_1211115 #(parameter n=4) (input [n:0] m, output reg signed [n+1:0] res);
2   always @(*)
3   begin
4     if(res>=(m<<1));
5   end
6   endmodule

```

Tasks: Compilation

Task List:

- Compile Design
- Analysis & Synthesis
- Place & Route
- Assembler
- Classic Timing Analysis
- EDA Netlist Writer
- Program Device (Open Programmer)

Message (164) / Processing (39) / Extra Info (27) / Info (27) / Warning (4) / CriticalWarning (4) / Error (4) / Suppressed (4) / Flag (1)

Message: 0 of 61

Quartus II - C:/Users/user/Desktop/digital\_project/project1 - [MUX8.1.v]

```

1 module MUX8_1_1211115 #(parameter n=4) ( input s0,s1,s2,I0,I1,I2,I3,I4,I5,I6,I7 , output reg signed res );
2   always @ (*)
3   begin
4     case (s0#(1&2))
5       3'b000 : res=I0;
6       3'b001 : res=I1;
7       3'b010 : res=I2;
8       3'b011 : res=I3;
9       3'b100 : res=I4;
10      3'b101 : res=I5;
11      3'b110 : res=I6;
12      3'b111 : res=I7;
13     default : res=1'b0;
14   endcase
15 end
16 endmodule

```

Tasks: Compilation

Task List:

- Compile Design
- Analysis & Synthesis
- Place & Route
- Assembler
- Classic Timing Analysis
- EDA Netlist Writer
- Program Device (Open Programmer)

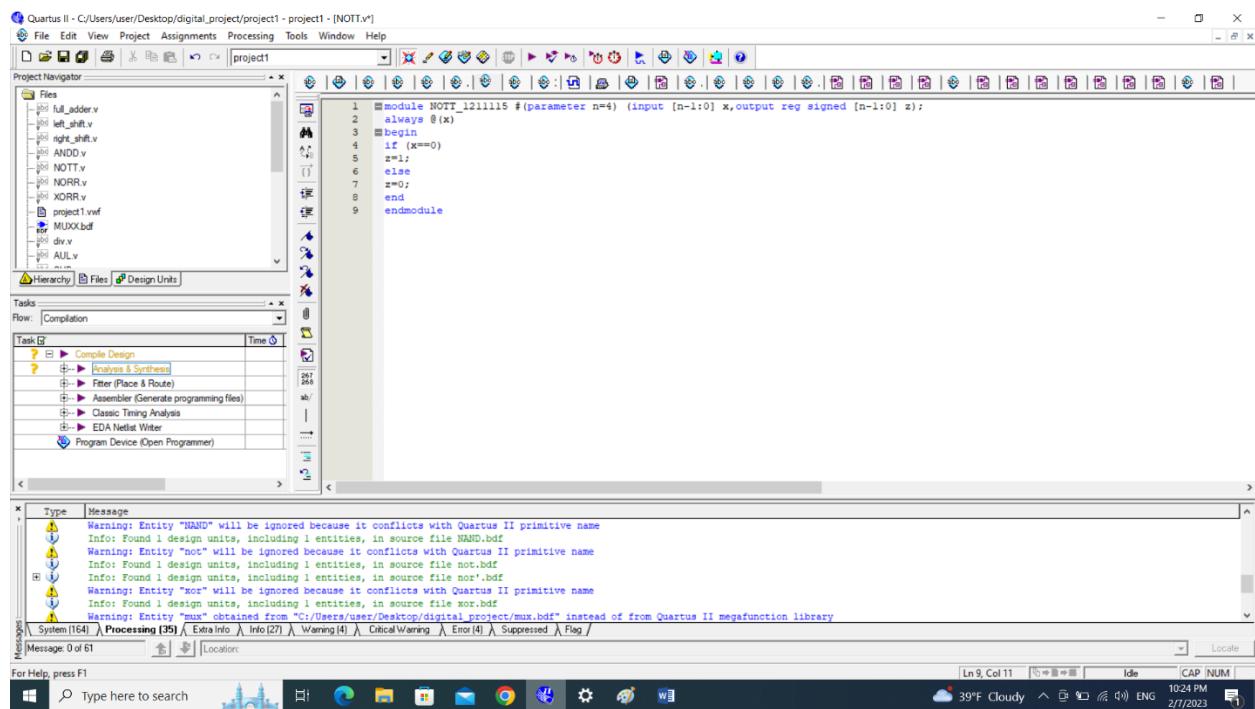
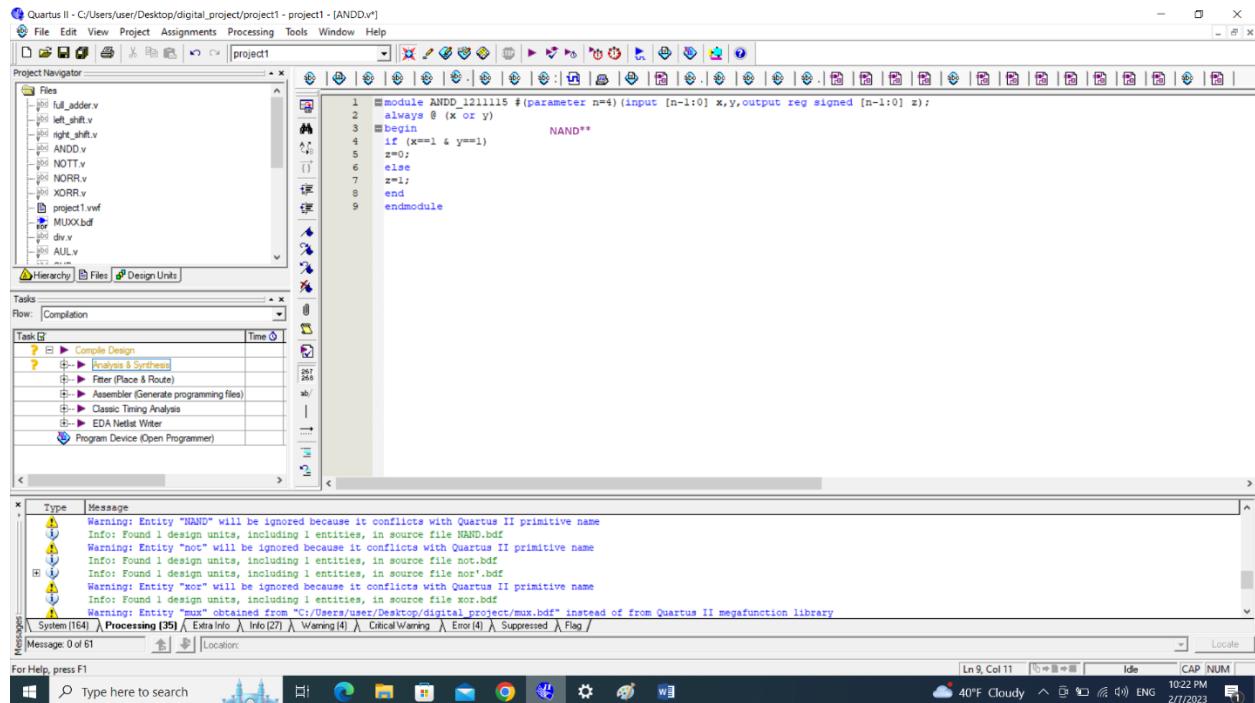
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Message: 0 of 61

# PROJECT-DIGITAL

Mariam turk

1211115



# PROJECT-DIGITAL

Mariam turk

1211115

Quartus II - C:/Users/user/Desktop/digital\_project/project1 - project1 - [NORR.v]

```

1 module NORR_1211115 #(parameter n=4) ( input [n-1:0] x,y , output reg signed [n-1:0] z);
2   always @(x or y)
3   begin
4     if(x==0 & y==0)
5       z=1;
6     else
7       z=0;
8   end
9 endmodule

```

Tasks: **Compile Design**

- Analyses & Synthesis
- Filter (Place & Route)
- Assembler (Generate programming files)
- Classic Timing Analysis
- EDA Netlist Writer
- Program Device (Open Programmer)

Message: 0 of 61

System [164] Processing [39] / Extra Info [27] / Info [27] / Warning [4] / CriticalWarning [4] / Error [4] / Suppressed [4] / Flag [4]

For Help, press F1

Windows Taskbar: Type here to search, Cloudy, 10:25 PM, 2/7/2023

Quartus II - C:/Users/user/Desktop/digital\_project/project1 - project1 - [XORR.v]

```

1 module XORR_1211115 #(parameter n=4) ( input [n-1:0] x,y , output reg signed [n-1:0] z);
2   always @(x or y)
3   begin
4     if(x==0 & y==0)
5       z=0;
6     else if (x==1 & y==1)
7       z=0;
8     else
9       z=1;
10    end
11 endmodule

```

Tasks: **Compile Design**

- Analyses & Synthesis
- Filter (Place & Route)
- Assembler (Generate programming files)
- Classic Timing Analysis
- EDA Netlist Writer
- Program Device (Open Programmer)

Message: 0 of 61

System [164] Processing [39] / Extra Info [27] / Info [27] / Warning [4] / CriticalWarning [4] / Error [4] / Suppressed [4] / Flag [4]

For Help, press F1

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# PROJECT-DIGITAL

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1211115

```

1  module div_1211115 #(parameter n=4) (input [n:0] x,y , output reg signed [n:0] res);
2   always @ (x or y)
3   begin
4     if(x==0)begin
5       res=0;
6     end
7   end
endmodule

```

Message window content:

- Warning: Entity "NAND" will be ignored because it conflicts with Quartus II primitive name
- Info: Found 1 design units, including 1 entities, in source file NAND.bdf
- Warning: Entity "not" will be ignored because it conflicts with Quartus II primitive name
- Info: Found 1 design units, including 1 entities, in source file not.bdf
- Info: Found 1 design units, including 1 entities, in source file nor.bdf
- Warning: Entity "xor" will be ignored because it conflicts with Quartus II primitive name
- Info: Found 1 design units, including 1 entities, in source file xor.bdf
- Warning: Entity "mum" obtained from "C:/Users/user/Desktop/digital\_project/mux.bdf" instead of from Quartus II megafunction library

```

1  module SUB_1_1211115 #(parameter n=4) (input [n-1:0] x,y ,output reg signed [n-1:0] res);
2   always @ (x or y)
3   begin
4     if(x>y)begin
5       res=x-y;
6     end
7   end
endmodule

```

Message window content:

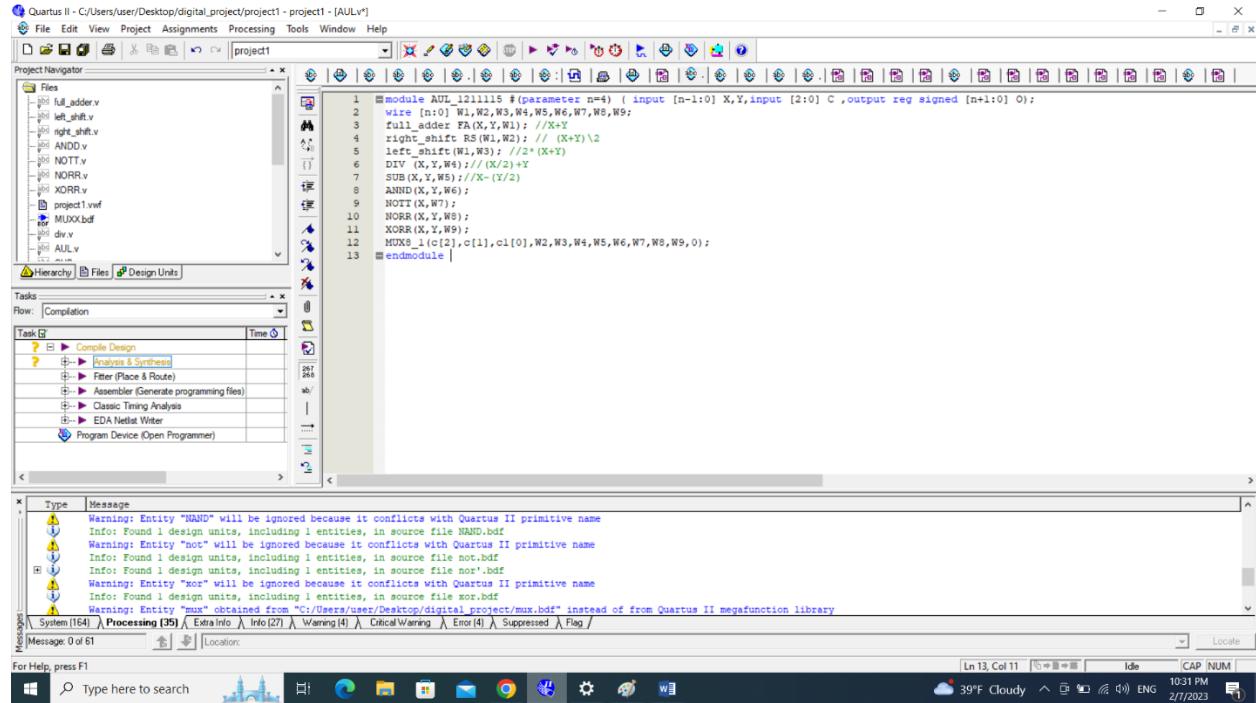
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# PROJECT-DIGITAL

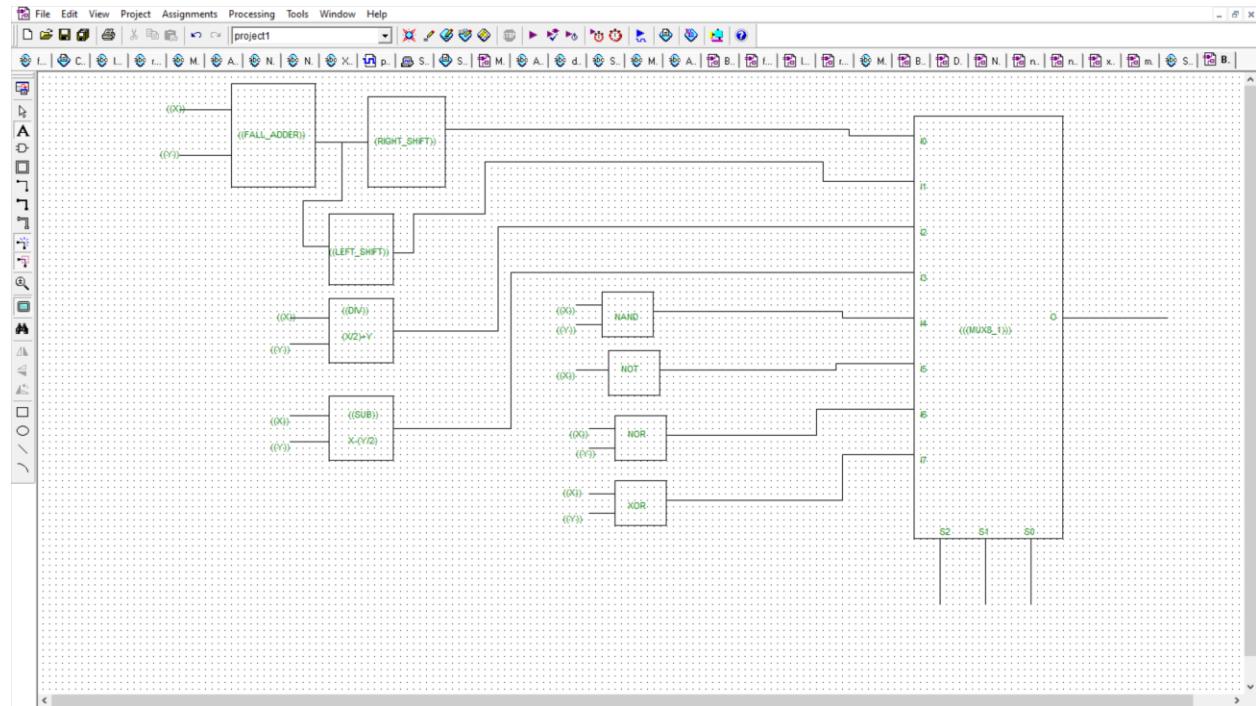
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**Q(4):**



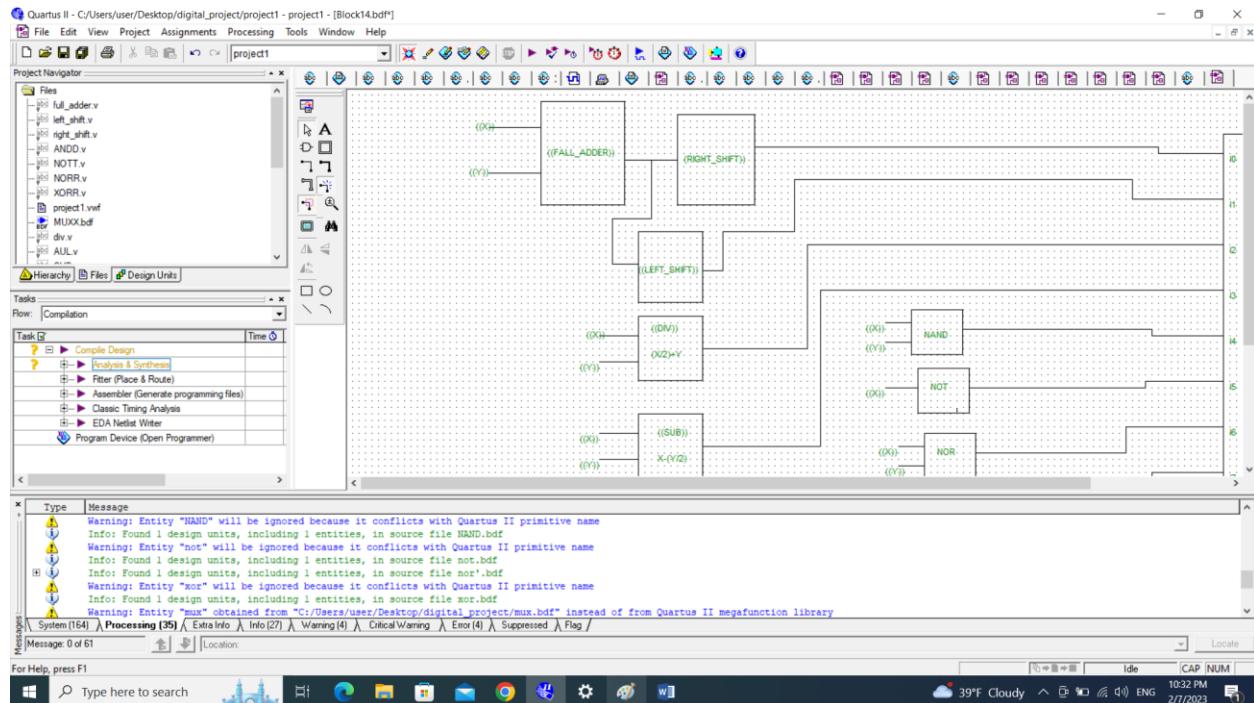
**Q(5):**



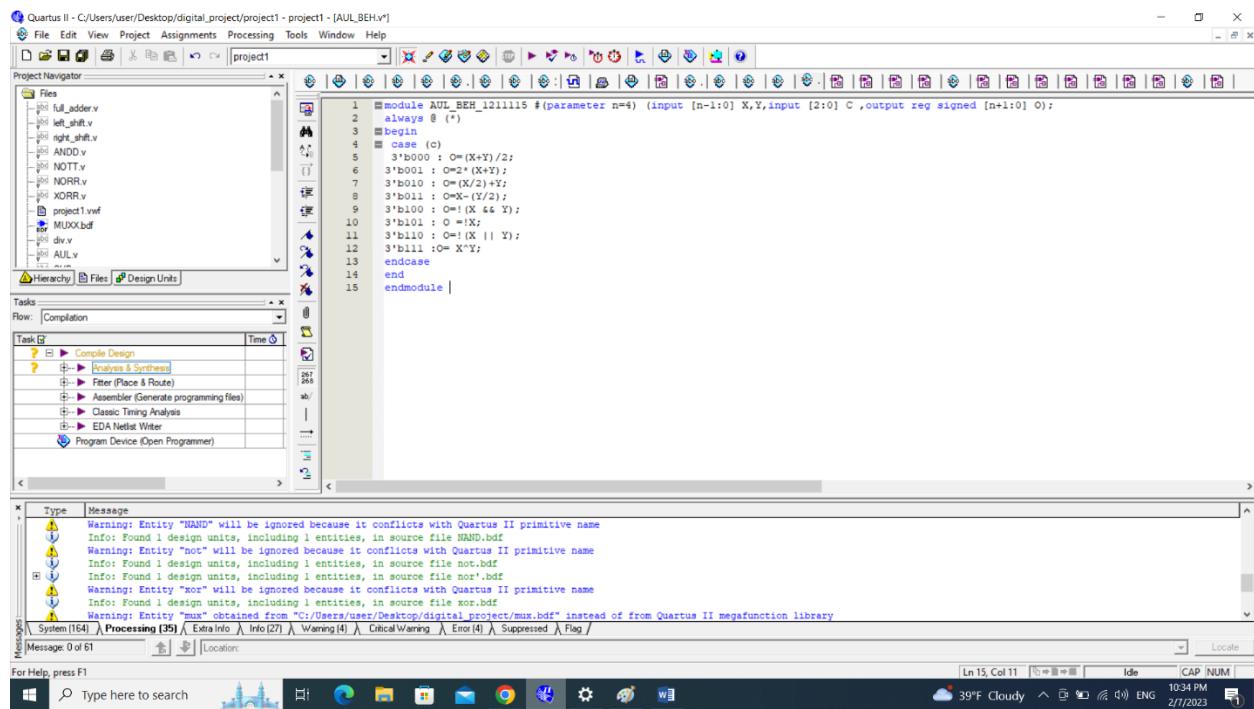
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Q(6):



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PROJECT-DIGITAL

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