#18301276

Problem 1:

$$Y = \bar{A}\bar{B}C + \bar{A}B\bar{C} + A\bar{B}\bar{C} + ABC$$

a)

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

Here, AND, OR and NOT logic operations are performed in the circuit for the output Y.

b) I picked randomly 2 time instances 20 ns and 30 ns.

for 20 ns and 30 ns,

Time Instances	A	B	C	Y
20	0	1	1	0
30	1	0	1	0

After crosschecking, it is clearly seen that outputs matched with truth table.

c) After assigning random values to input pins, I picked two time instances 10 ns and 20 ns.

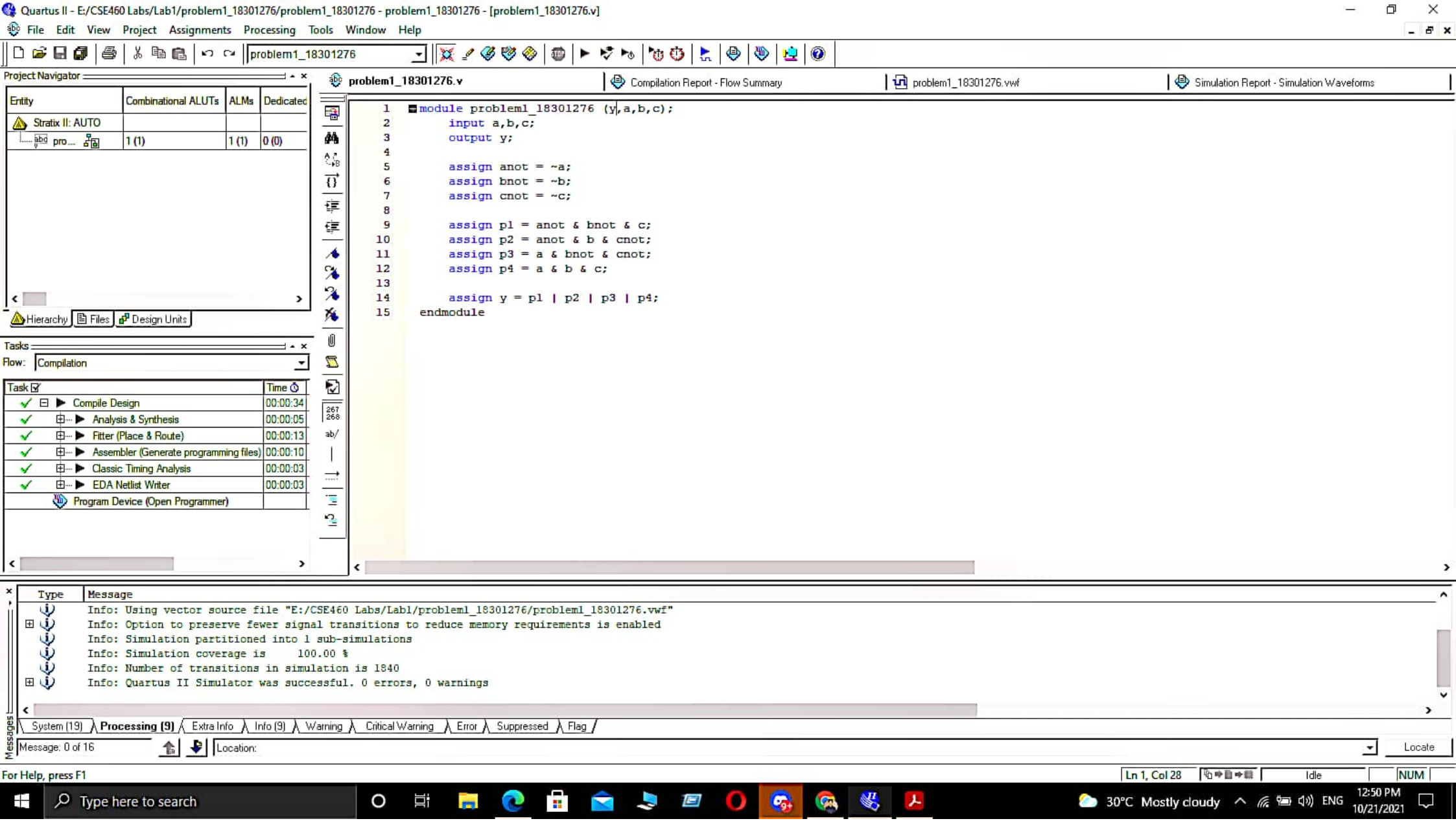
Time Instances	A	B	C	Y
10	0	0	1	1
20	1	0	0	1

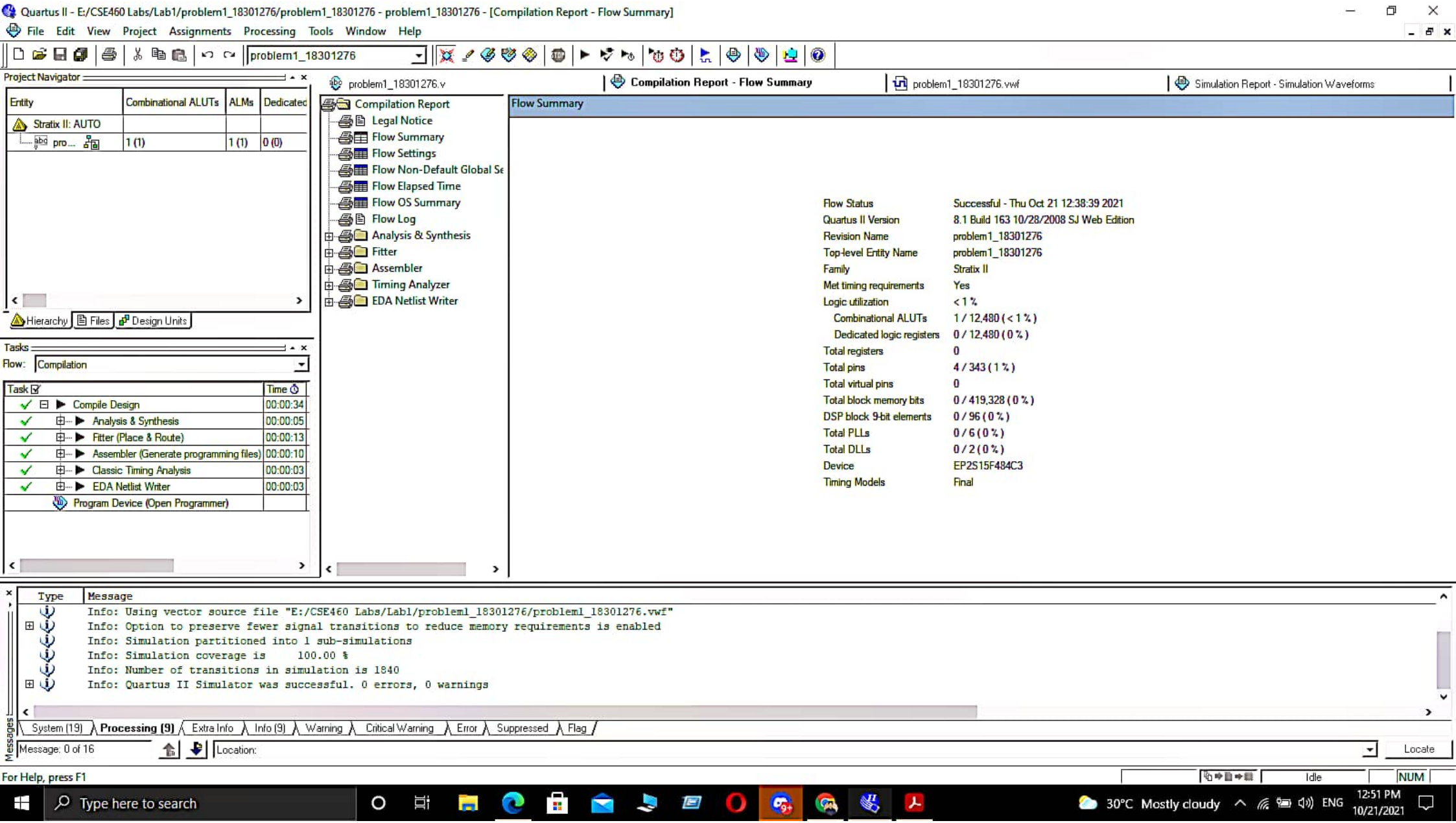
We can see, outputs matched with fourth table.

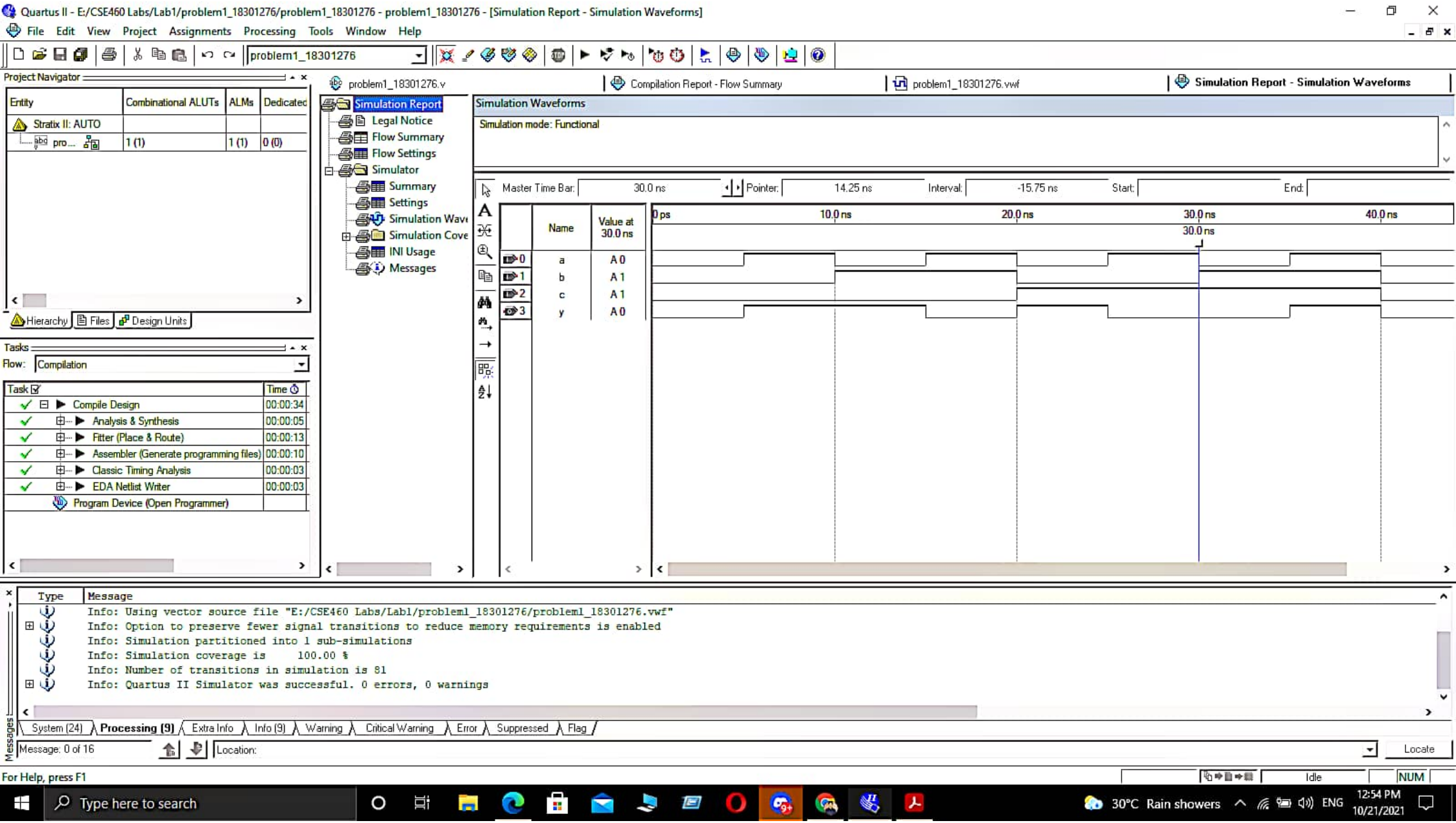
d) If we modify the equation for only NAND gates, then it will be

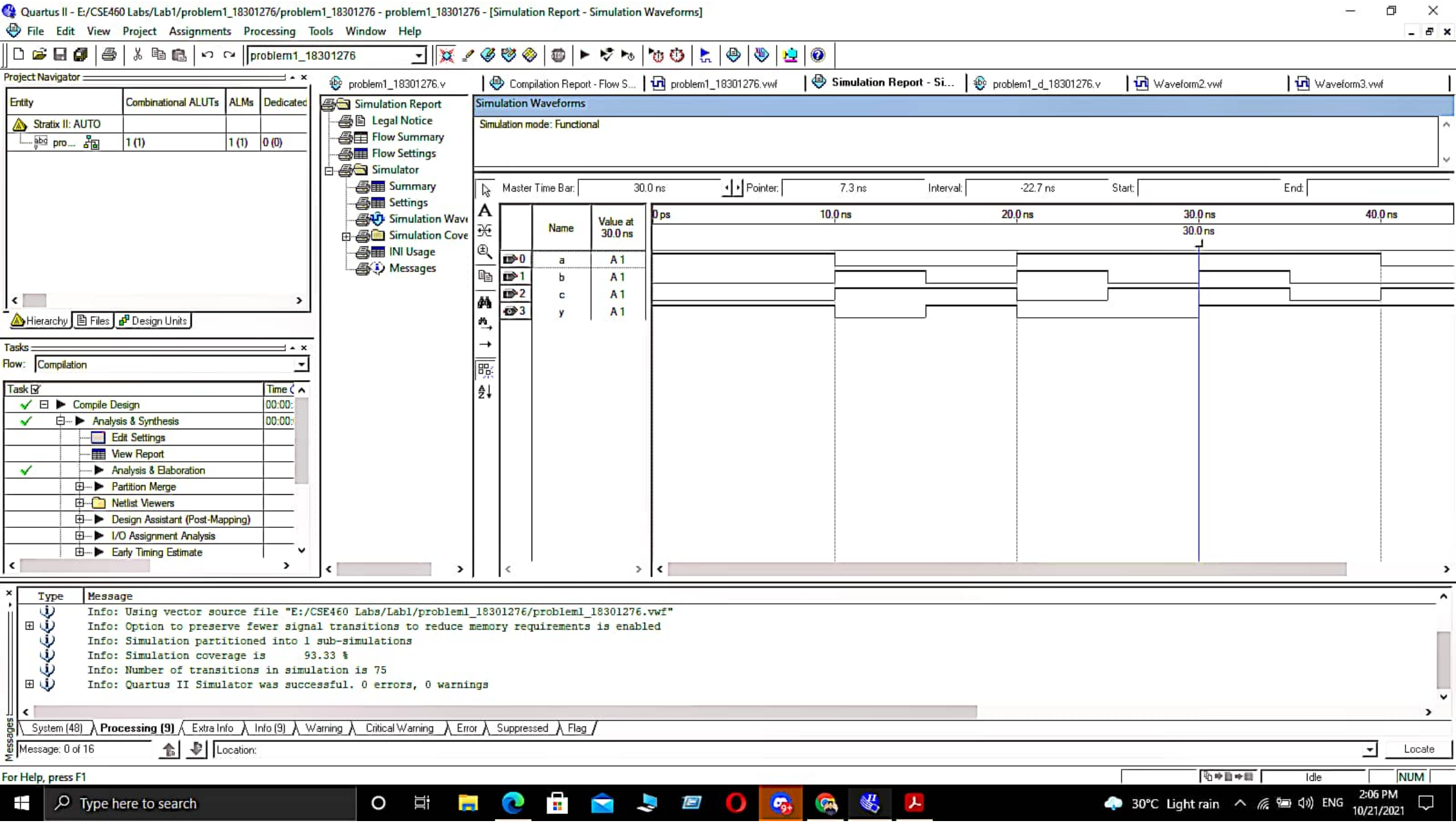
$$\overline{(\overline{A}.A.\overline{B}.B.C)}.\overline{(\overline{A}.A.B.\overline{C}.C)}.\overline{(A.\overline{B}.B.\overline{C}.C)}.\overline{(A.B.\overline{C})}$$

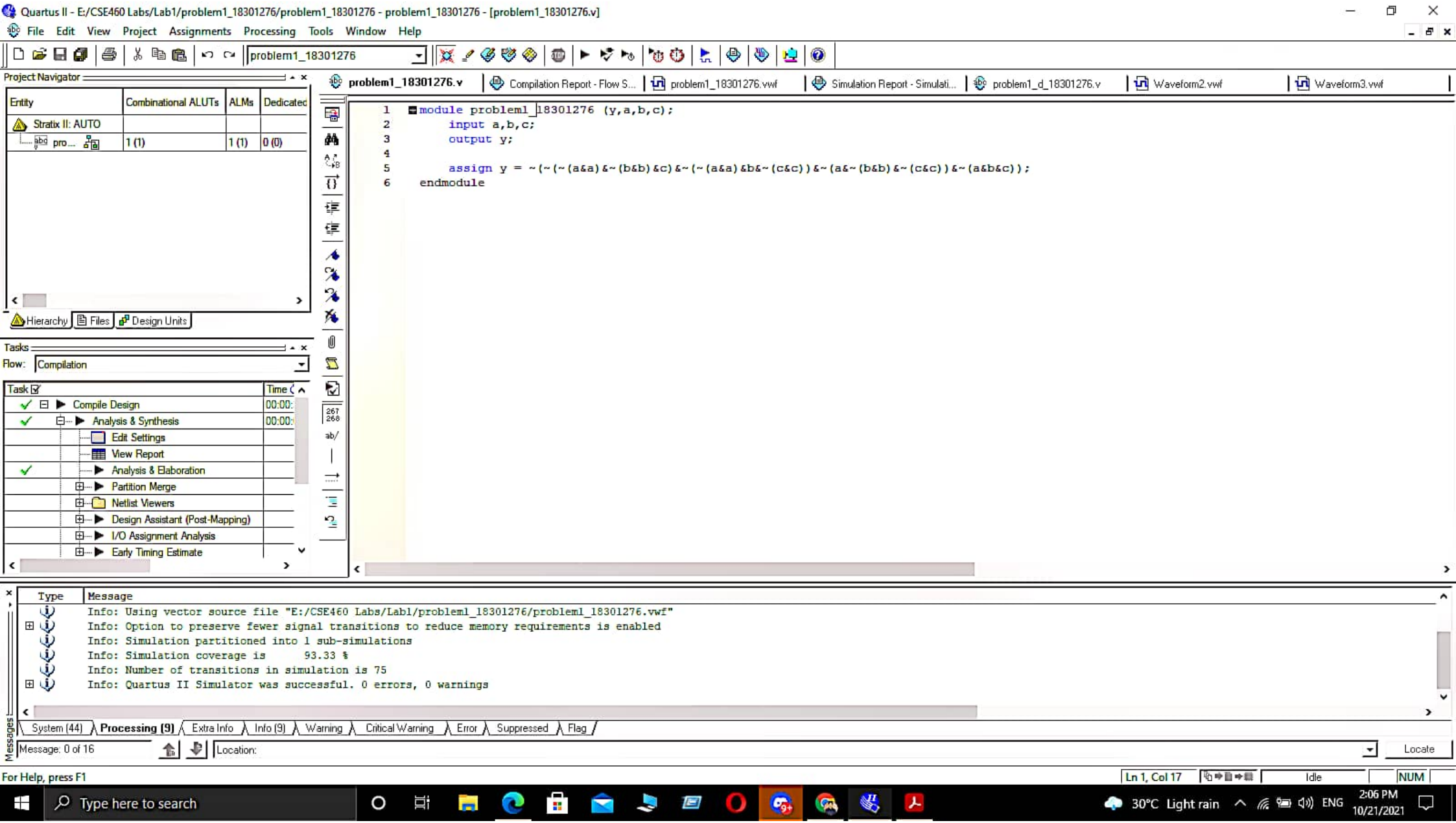
Now, the logic circuit of this equation can be made using only NAND gates.



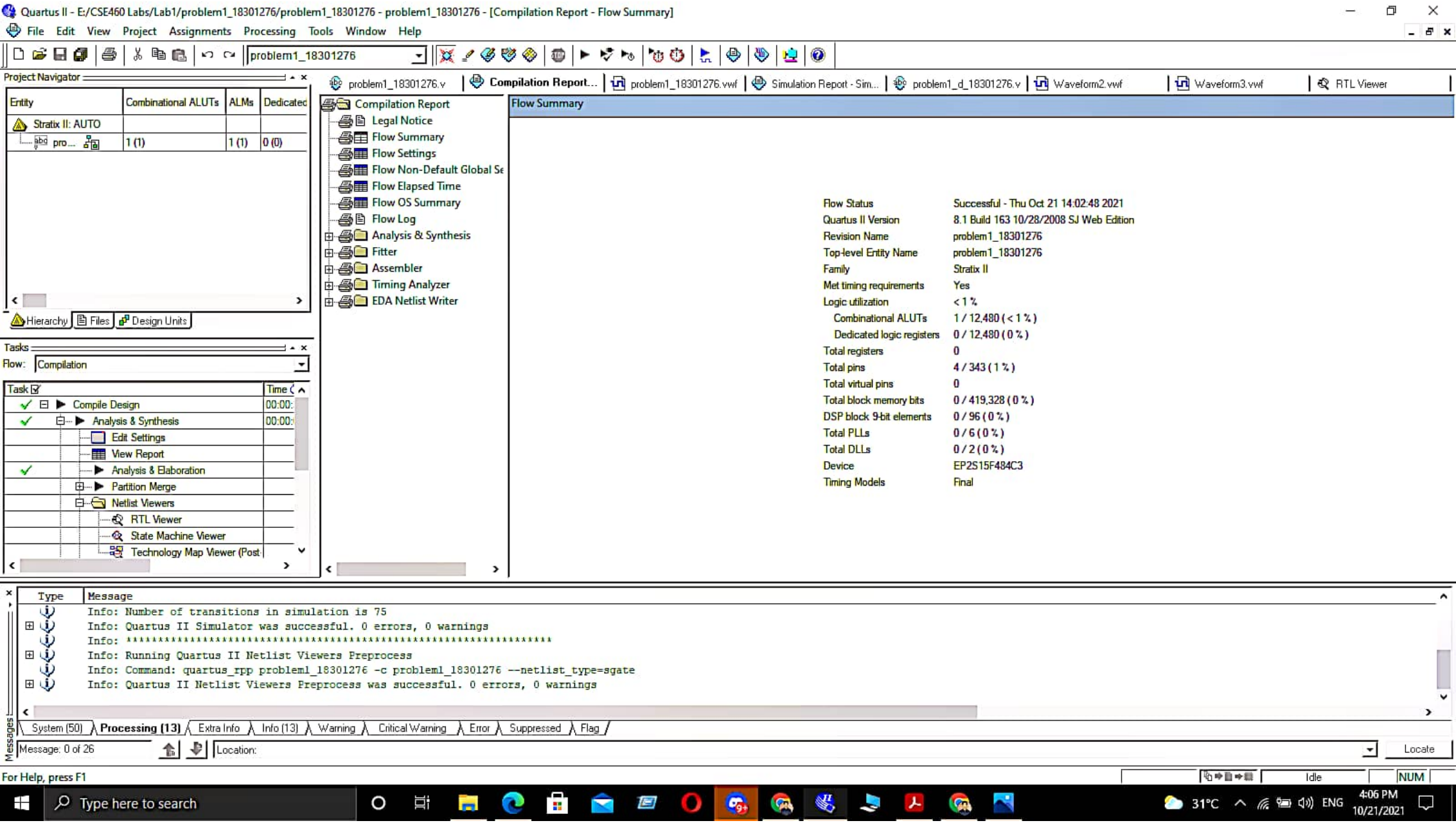








Scanned with CamScanner



Quartus II - E:/CSE460 Labs/Lab1/problem1_18301276/problem1_18301276 - problem1_18301276 - [RTL Viewer]

File Edit View Project Assignments Processing Tools Window Help

problem1_18301276

Project Navigator

Entity	Combinational ALUTs	ALMs	Dedicated
Stratix II: AUTO			
pro...	1 (1)	1 (1)	0 (0)

Hierarchy Files Design Units

Tasks

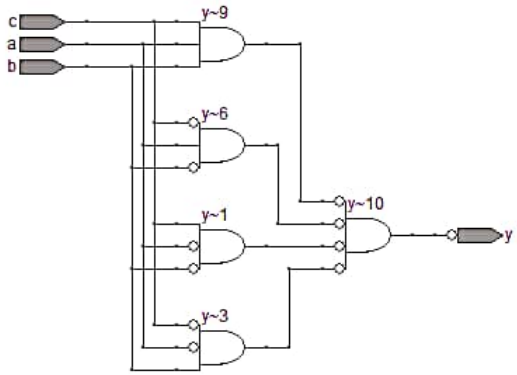
Flow: Compilation

Task	Time
Compile Design	00:00:
Analysis & Synthesis	00:00:
Edit Settings	
View Report	
Analysis & Elaboration	
Partition Merge	
Netlist Viewers	
RTL Viewer	
State Machine Viewer	
Technology Map Viewer (Post	

problem1_18301276.v | Compilation Report - Fl... | problem1_18301276.vwf | Simulation Report - Sim... | problem1_d_18301276.v | Waveform2.vwf | Waveform3.vwf | RTL Viewer

Page Title: problem1_18301276 Page: 1 of 1

Hierarchy List
- problem1_18301276
  - Primitives
  - Pins
  - Nets



Type	Message
	Info: Number of transitions in simulation is 75
	Info: Quartus II Simulator was successful. 0 errors, 0 warnings
	Info: **********
	Info: Running Quartus II Netlist Viewers Preprocess
	Info: Command: quartus_rpp problem1_18301276 -c problem1_18301276 --netlist_type=sgate
	Info: Quartus II Netlist Viewers Preprocess was successful. 0 errors, 0 warnings

System (50) Processing (13) Extra Info Info (13) Warning Critical Warning Error Suppressed Flag

Message: 0 of 26 Location: Locate

For Help, press F1 Idle NUM

Type here to search 30°C Light rain ENG 2:07 PM 10/21/2021