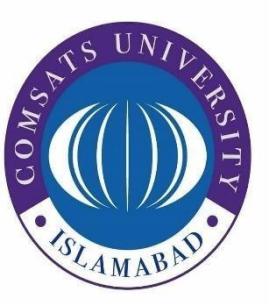

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Lab assignment#02

Subject: Digital & Logic design

Presented to: Sir Sarmad Hassan

Question no:01

A. Design a Half Adder and Full Adder using 74153 IC.

Let truth table variables are

A= Selection input

B= Input S=Sum

C= Carry

Truth table of Half Adder:

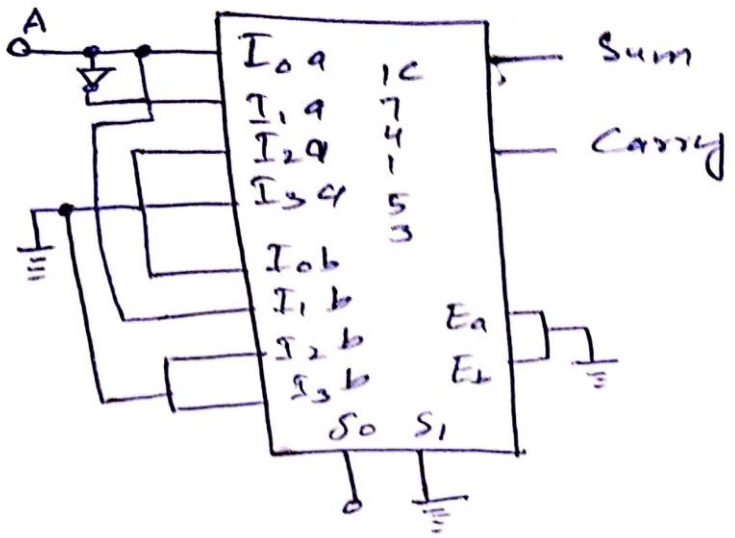
A	B	S	C	N1	N2
0	0	0	0	B	0
0	1	1	0		
1	0	1	0	B’	B
1	1	0	1		

Truth table of Full Adder:

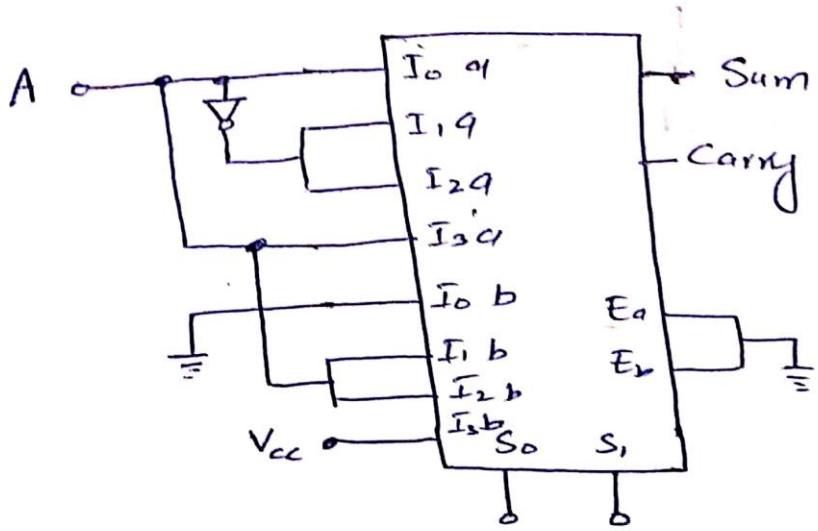
A	B	C	S	Carry	N1	N2
0	0	0	0	0	C	0
0	0	1	1	0		
0	1	0	1	0	C’	C
0	1	1	0	1		
1	0	0	1	0	C’	C
1	0	1	0	1		
1	1	0	0	1	C	1
1	1	1	1	1		

Designing logic circuit of Half & Full Adder using IC:

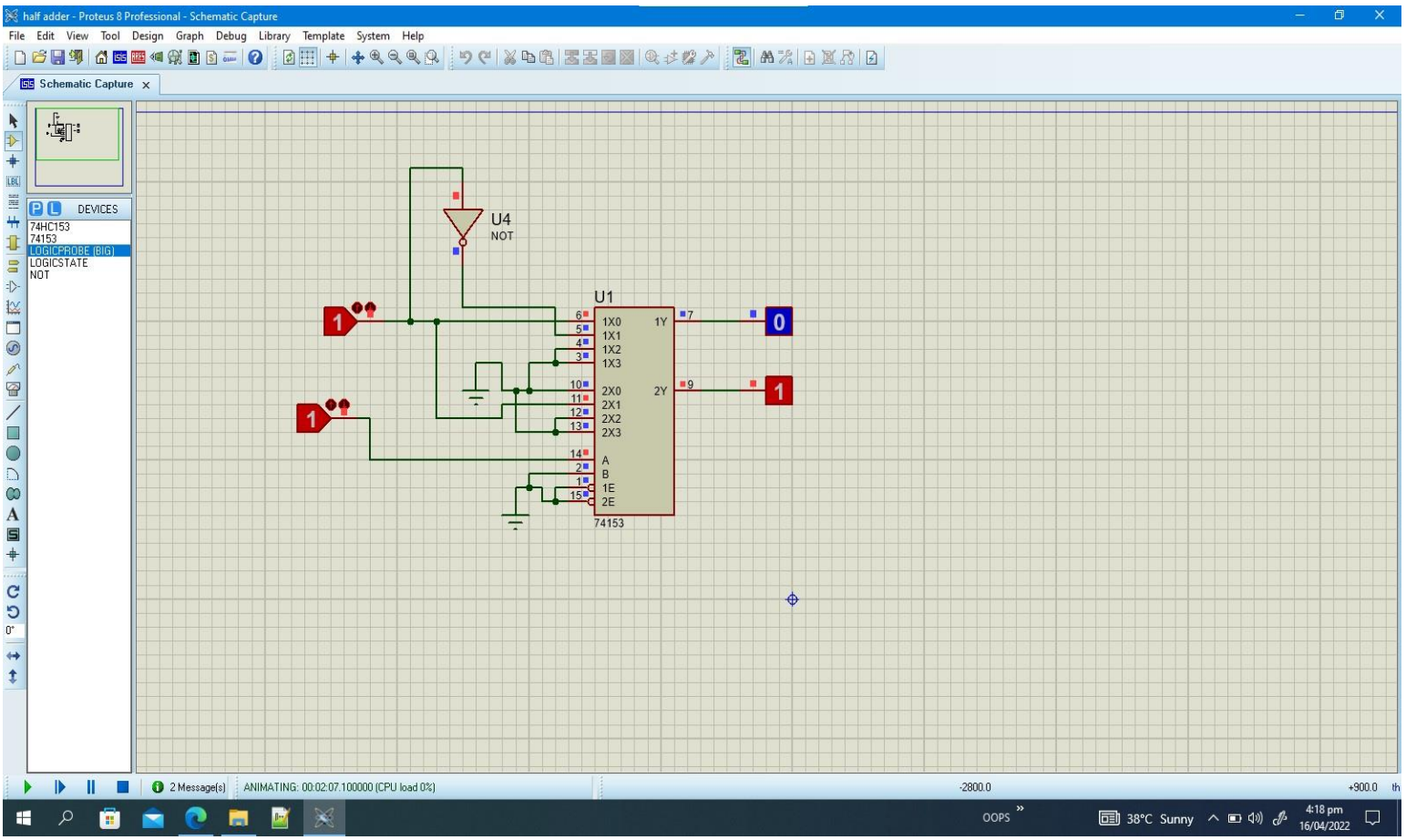
Half Adder:

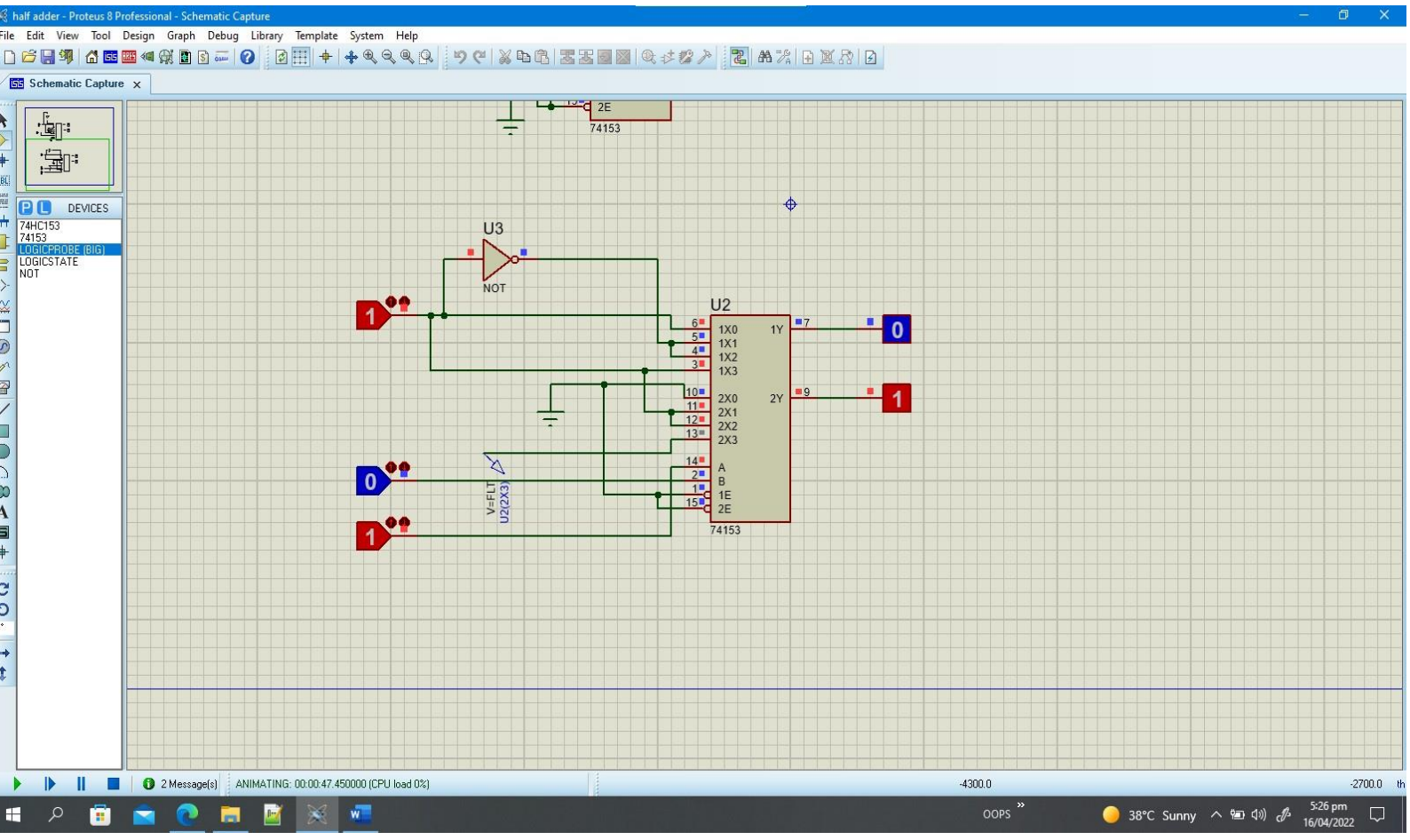


Full Adder



Implemented circuit of Half Adder & Full Adder on Proteus:





B. Design a Half and Full Subtractor using 74153 IC.

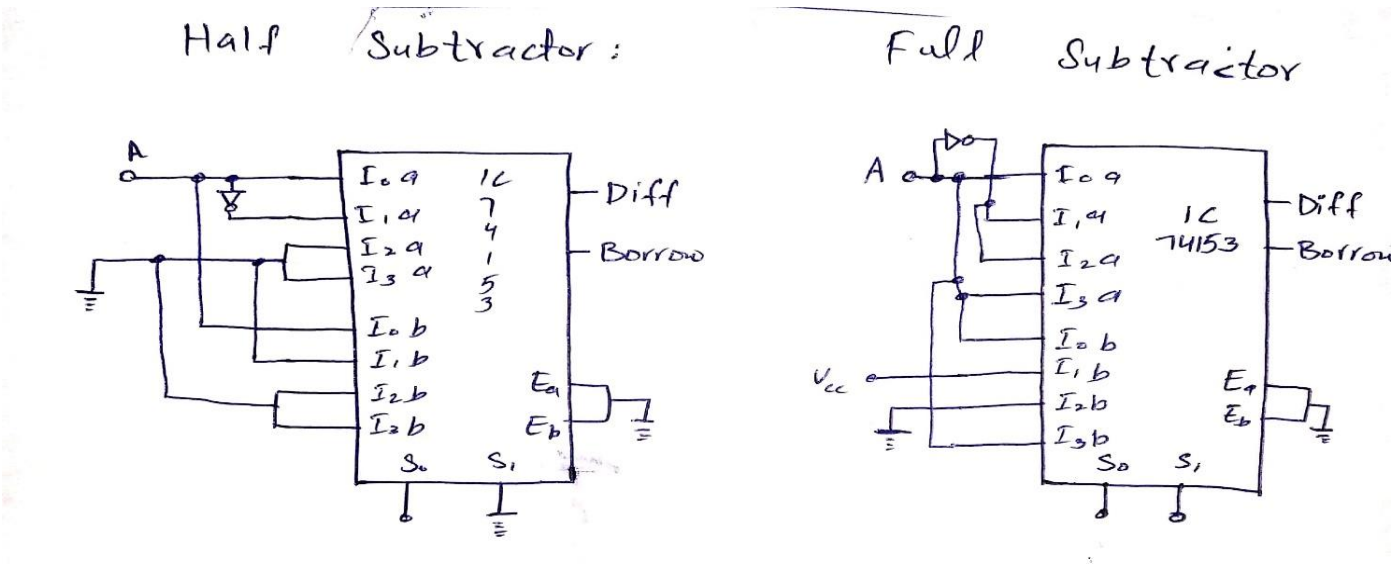
Truth table of Half Subtractor:

A	B	difference	Carry	N1	N2
0	0	0	0	B	B
0	1	1	1		
1	0	1	0	B'	0
1	1	0	0		

Truth table of Full Subtractor:

A	B	C	Difference	Carry	N1	N2
0	0	0	0	0	C	C
0	0	1	1	1		
0	1	0	1	1	C'	1
0	1	1	0	1		
1	0	0	1	0	C'	0
1	0	1	0	0		
1	1	0	0	0	C	C
1	1	1	1	1		

Logic Diagram of Half & Full Subtractor:



Output of Half & Full Subtractor on Proteus: