COA LPE

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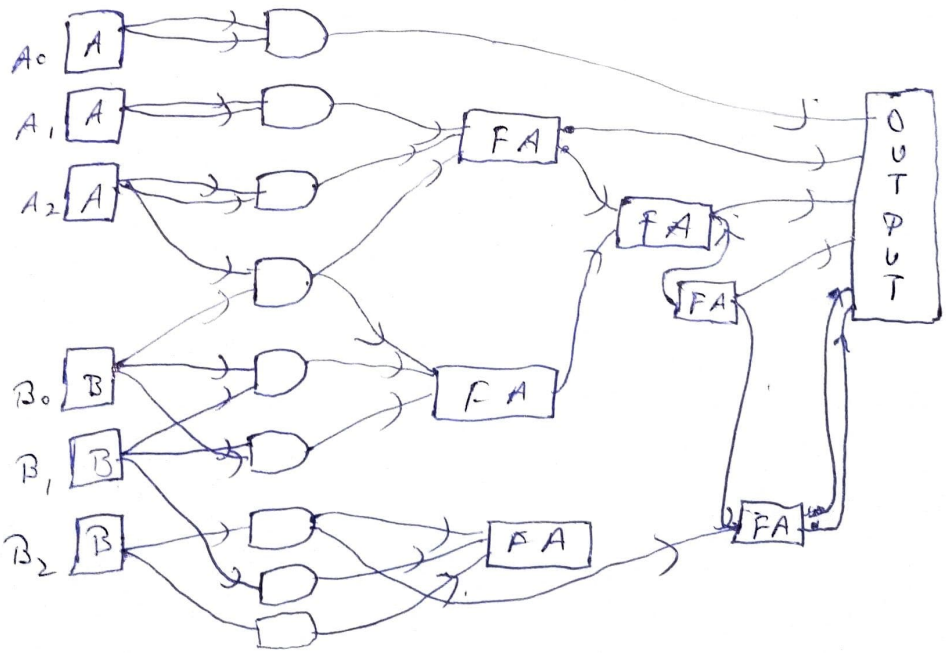
Alloted question No-(26)

Q1.) Implement Carry Save Multiplier for 3 bit input.

AIM: To design and implement a Carry save multiplier for 3 bit input.

SOFTWARE: Logic gate simulator

Circuit diagram:-



Procedure

- open logic gate simulator
- create a full adder circuit first
- Then create an IC using the full adder circuit
- Now open a new file in logic gatesim
- Take 6 user inputs and place as given in circuit diagram.
- And using AND gates of total 9 and give connection.
- Now export IC of full adder and place it in circuit connection. A total of 6 full adder IC must be used
- Now for output select numeric output and given 6 pin connector.
- Give proper connections.

TRUTH TABLE :- (Keeping $A_0 = 1$, $A_1 = 1$)

A_0	A_1	A_2	B_0	B_1	B_2	Output
1	0	0	1	0	0	1
1	0	0	0	1	0	2
1	0	0	0	0	1	4
1	0	0	1	1	0	3
1	0	0	0	1	1	6
1	0	0	1	0	1	5
1	0	0	1	1	1	7
0	1	0	1	0	0	2
0	1	0	0	1	0	4
0	1	0	0	0	1	8
0	1	0	1	1	0	6
0	1	0	0	1	1	C
0	1	0	1	0	1	A
0	1	0	1	1	1	F

02.) Subtraction of 2 numbers in 8086

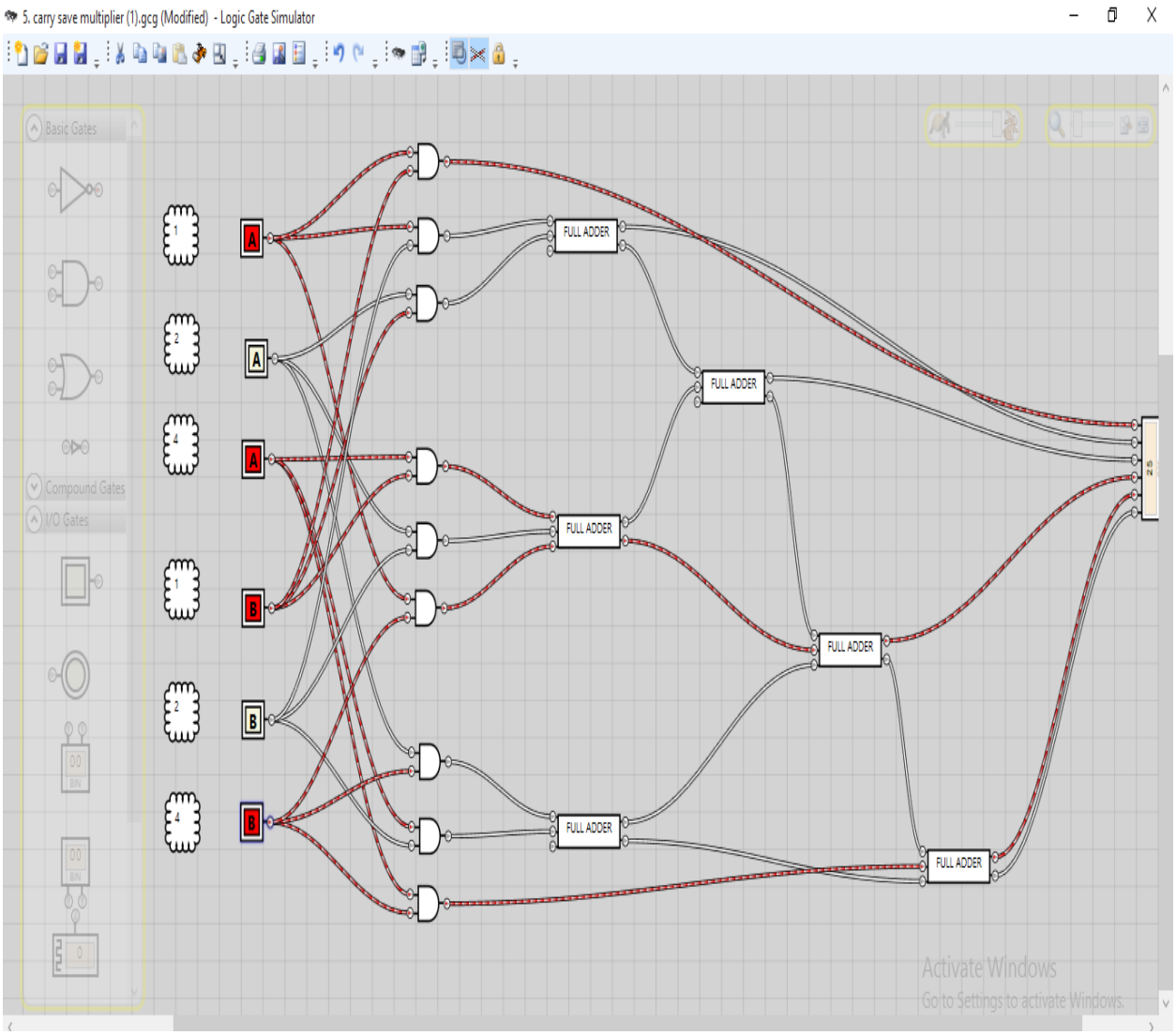
Algorithm:-

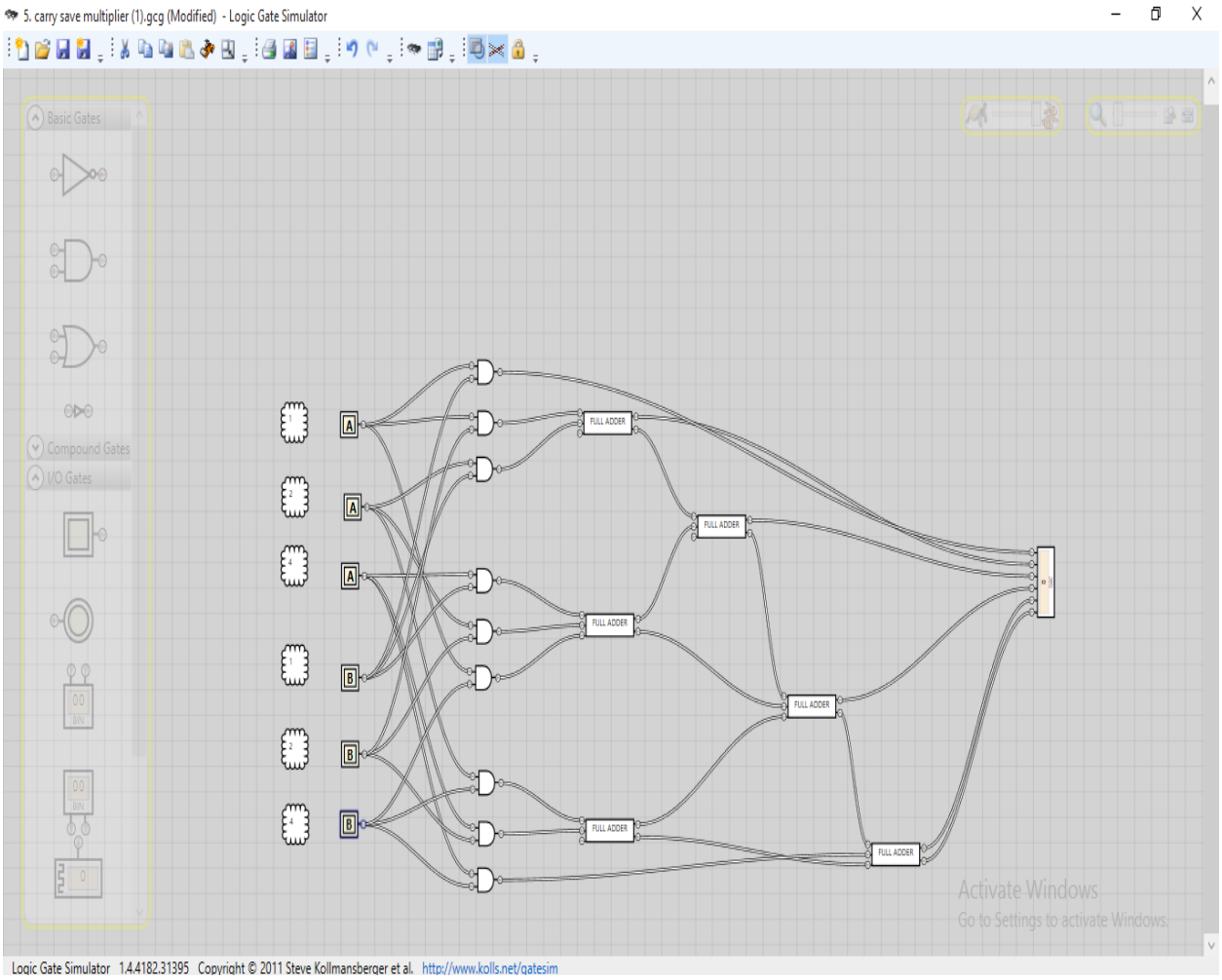
```
data segment
A db 0Fh
B db 0Ch
data ends

Code segment
assume CS: code , ds: data
Start:
mov ax, data
mov ds, ax
mov al, A
mov bl, B
sub al, B1
mov cx, ax
Code ends
end start
```

Algorithm :

1.) Load data to register AL (1st No)
2.) Load data to register BL (2nd No)
3.) Subtract these two numbers
(contents of register AL and register BL)
4.) Apply DAS instruction (decimal adjust)
5.) Store result (content of AL)
6.) Set register AL to 00
7.) Add contents of register AL
to itself with carry (borrow)
8.) Store the result (content of register AL)
9.) Stop


5. carry save multiplier (1).gcg (Modified) - Logic Gate Simulator
Basic Gates
Compound Gates
I/O Gates
A
A
A
B
B
B
FULL ADDER
FULL ADDER
FULL ADDER
FULL ADDER
FULL ADDER
FULL ADDER
Activate Windows
Go to Settings to activate Windows.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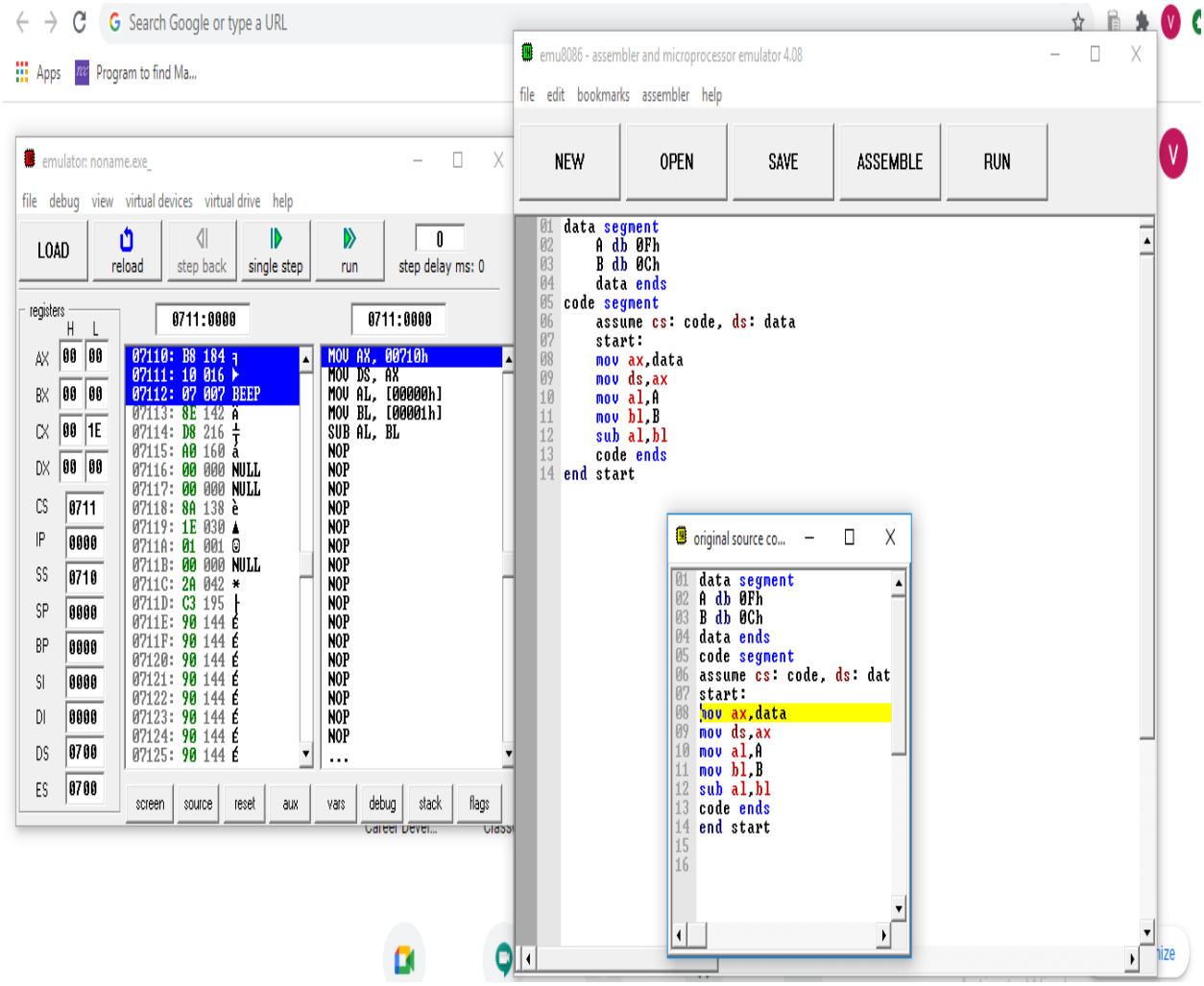
Go to Settings to activate Windows.
Logic Gate Simulator 1.4.4182.31395 Copyright © 2011 Steve Kollmansberger et al. http://www.kolls.net/gatesim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Apps
Program to find Ma...
emulator: noname.exe_
file debug view virtual devices virtual drive help
LOAD
reload
step back
single step
run
step delay ms: 0
registers
H L
AX 00 00
BX 00 00
CX 00 1E
DX 00 00
CS 0711
IP 0000
SS 0710
SP 0000
BP 0000
SI 0000
DI 0000
DS 0700
ES 0700
0711:0000
0711:0000
07110: B8 184
07111: 10 016
07112: 07 007 BEEP
07113: 8E 142
07114: D8 216
07115: A0 160
07116: 00 000 NULL
07117: 00 000 NULL
07118: 8A 138
07119: 1E 030
0711A: 01 001
0711B: 00 000 NULL
0711C: 2A 042 *
0711D: C3 195
0711E: 90 144
0711F: 90 144
07120: 90 144
07121: 90 144
07122: 90 144
07123: 90 144
07124: 90 144
07125: 90 144
MOV AX, 0710h
MOV DS, AX
MOV AL, [00000h]
MOV BL, [00001h]
SUB AL, BL
NOP
NOP
NOP
NOP
NOP
NOP
NOP
NOP
NOP
NOP
NOP
NOP
NOP
...
screen source reset aux vars debug stack flags
emu8086 - assembler and microprocessor emulator 4.08
file edit bookmarks assembler help
NEW OPEN SAVE ASSEMBLE RUN
01 data segment
02 A db 0Fh
03 B db 0Ch
04 data ends
05 code segment
06 assume cs: code, ds: data
07 start:
08 mov ax,data
09 mov ds,ax
10 mov al,A
11 mov bl,B
12 sub al,bl
13 code ends
14 end start
original source co...
01 data segment
02 A db 0Fh
03 B db 0Ch
04 data ends
05 code segment
06 assume cs: code, ds: dat
07 start:
08 mov ax,data
09 mov ds,ax
10 mov al,A
11 mov bl,B
12 sub al,bl
13 code ends
14 end start
15
16

Hence Subtraction of two 8 bit Numbers are done.