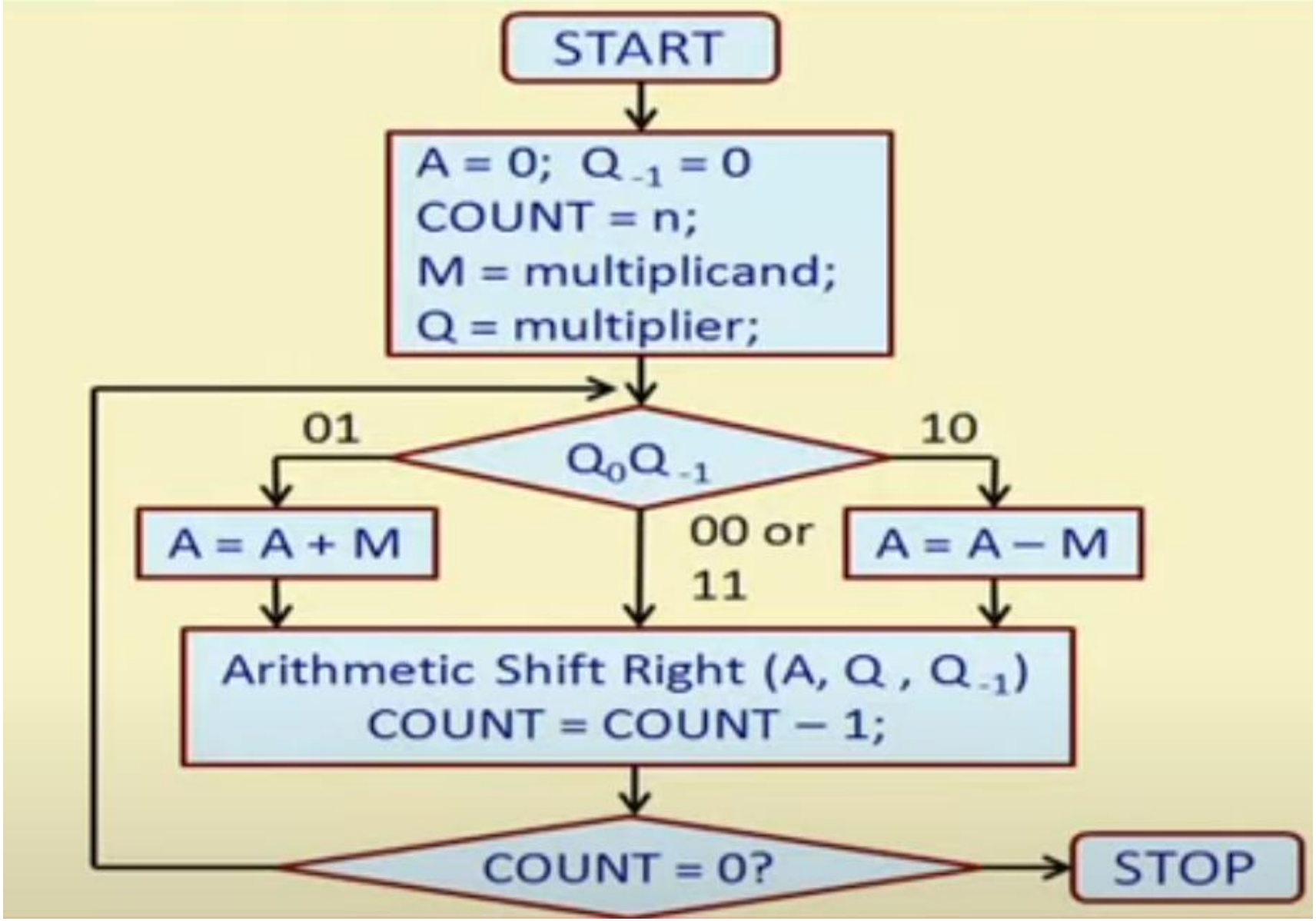
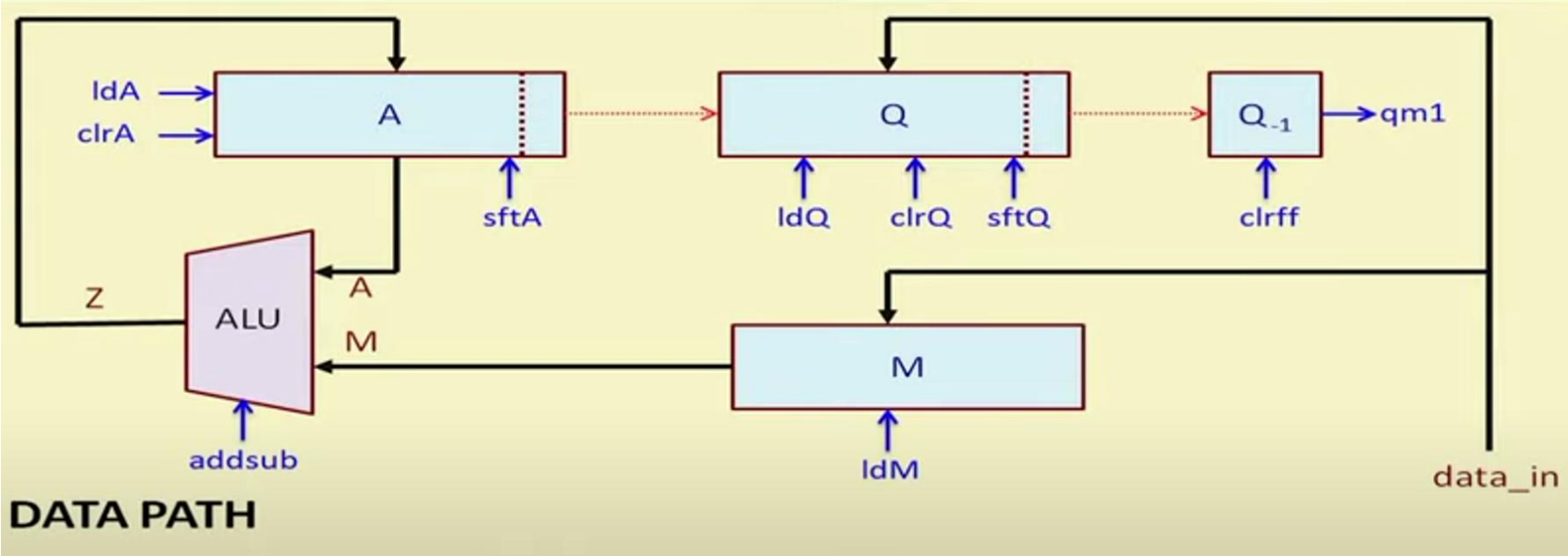
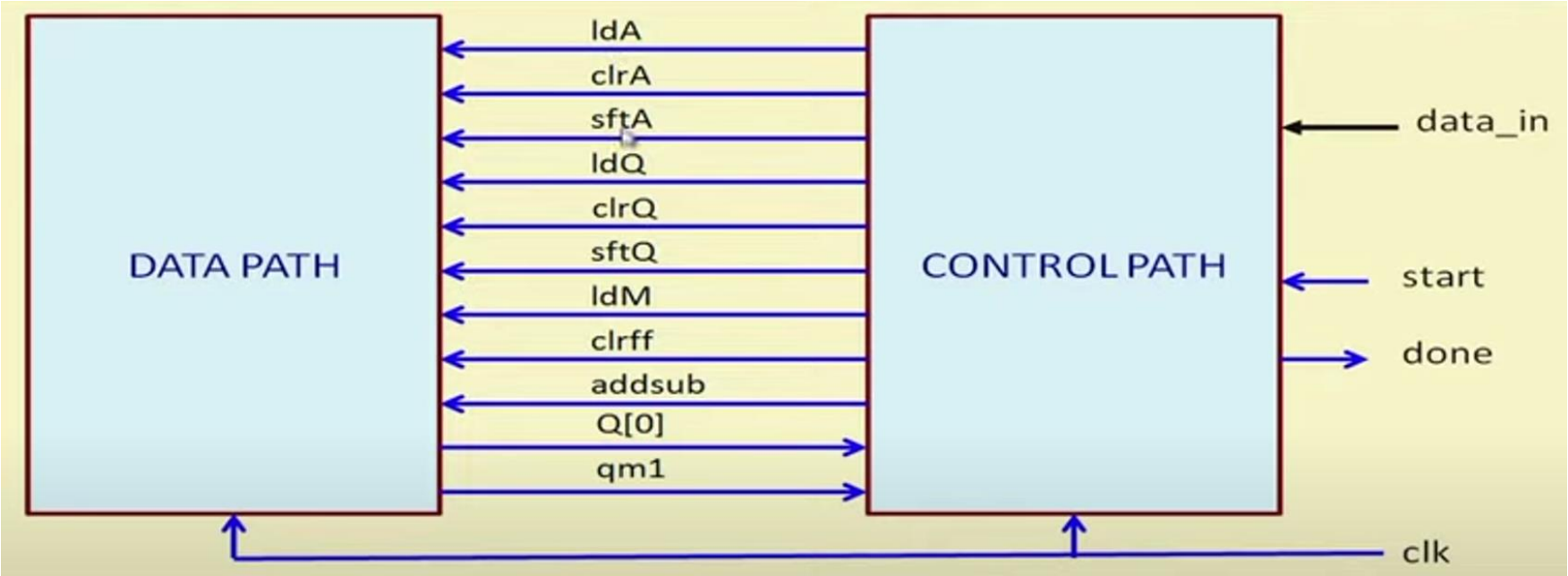
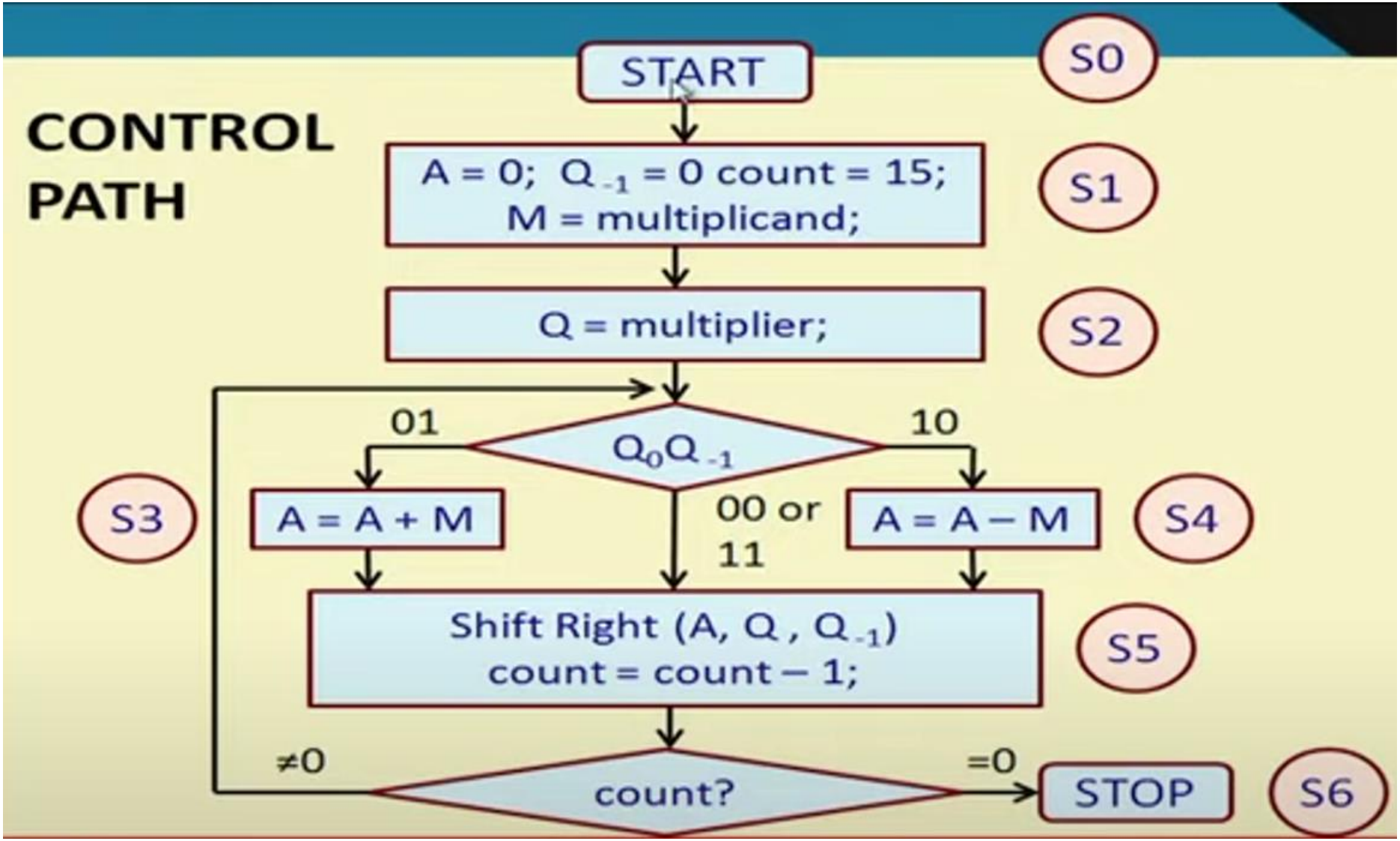
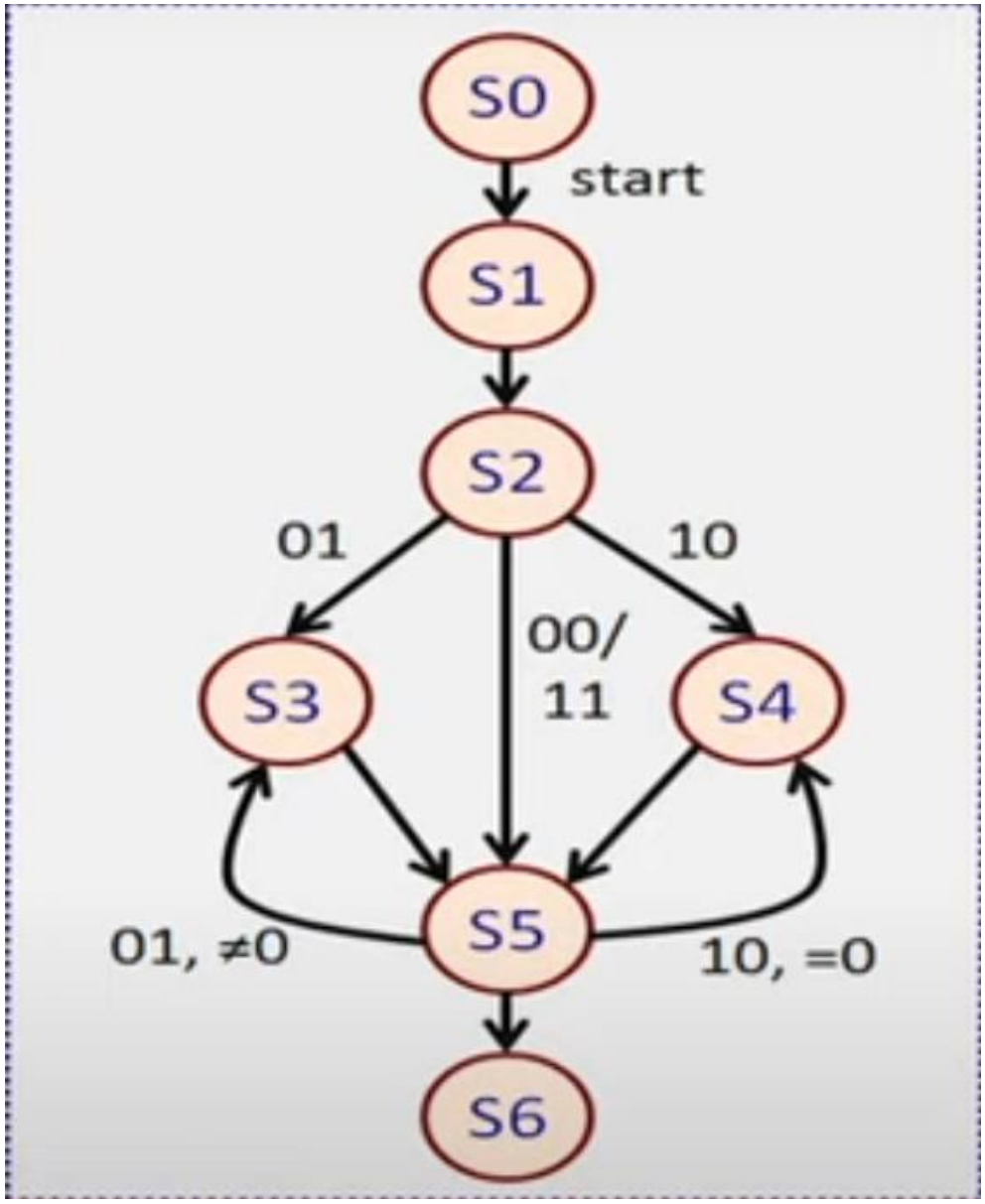
Booths Algorithm of Signed Multiplication

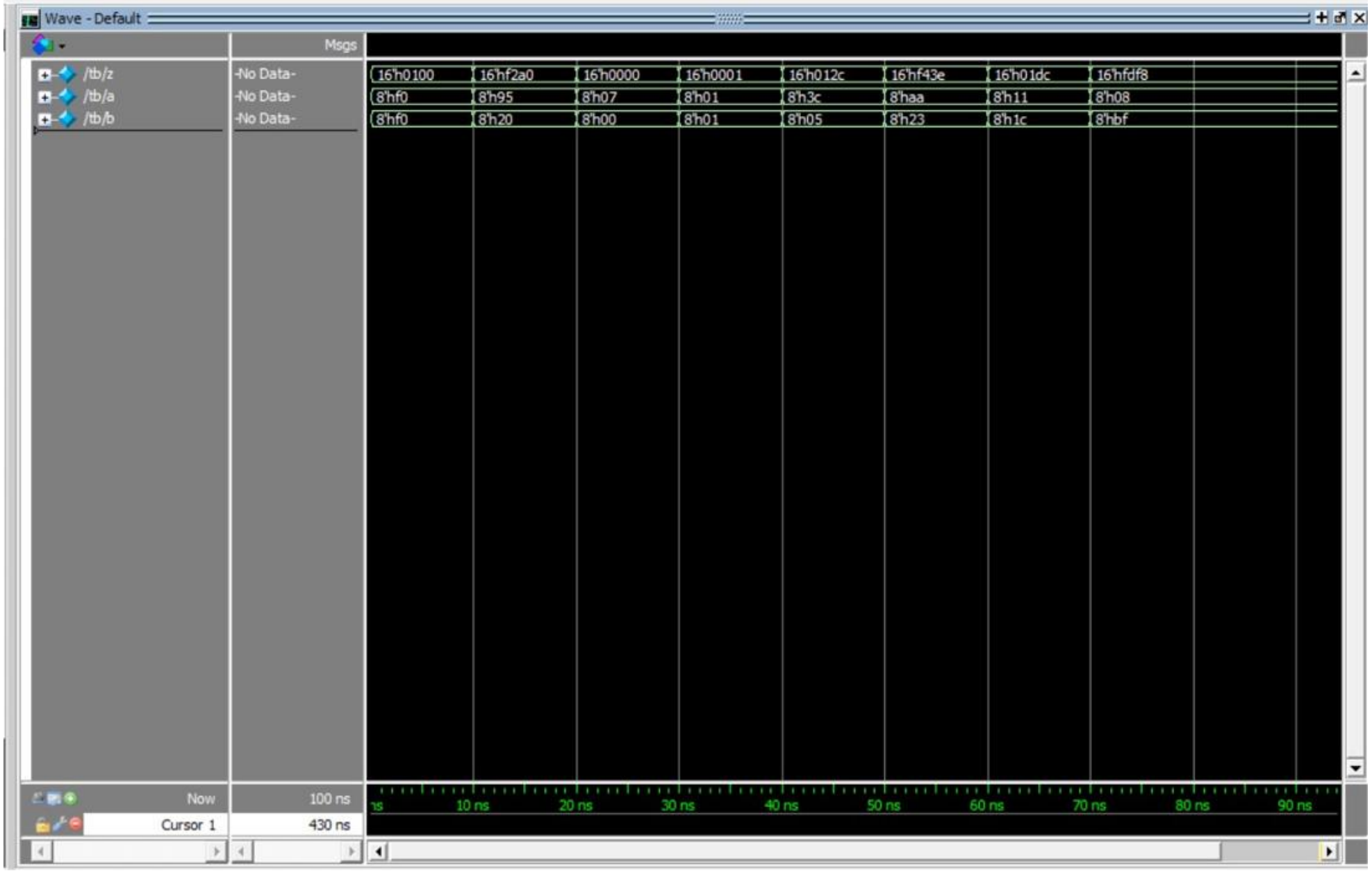



ldA
clrA
A
sftA
Q
ldQ
clrQ
sftQ
Q-1
qm1
clrff
Z
ALU
A
M
M
addsub
ldM
data_in
DATA PATH


DATA PATH
ldA
clrA
sftA
ldQ
clrQ
sftQ
ldM
clrff
addsub
Q[0]
qm1
CONTROL PATH
data_in
start
done
clk


CONTROL PATH
START
S0
A = 0; Q -1 = 0 count = 15;
M = multiplicand;
S1
Q = multiplier;
S2
01
Q0Q -1
10
S3
A = A + M
00 or
11
A = A – M
S4
Shift Right (A, Q , Q -1)
count = count – 1;
S5
≠0
count?
=0
STOP
S6


S0
start
S1
S2
01
10
00/
11
S3
S4
S5
01, ≠0
10, =0
S6


Wave - Default
Msgs
/tb/z
/tb/a
/tb/b
-No Data-
-No Data-
-No Data-
16'h0100
16'hf2a0
16'h0000
16'h0001
16'h012c
16'hf43e
16'h01dc
16'hfdf8
8'hf0
8'h95
8'h07
8'h01
8'h3c
8'haa
8'h11
8'h08
8'hf0
8'h20
8'h00
8'h01
8'h05
8'h23
8'h1c
8'hbf
Now
100 ns
Cursor 1
430 ns
ns
10 ns
20 ns
30 ns
40 ns
50 ns
60 ns
70 ns
80 ns
90 ns