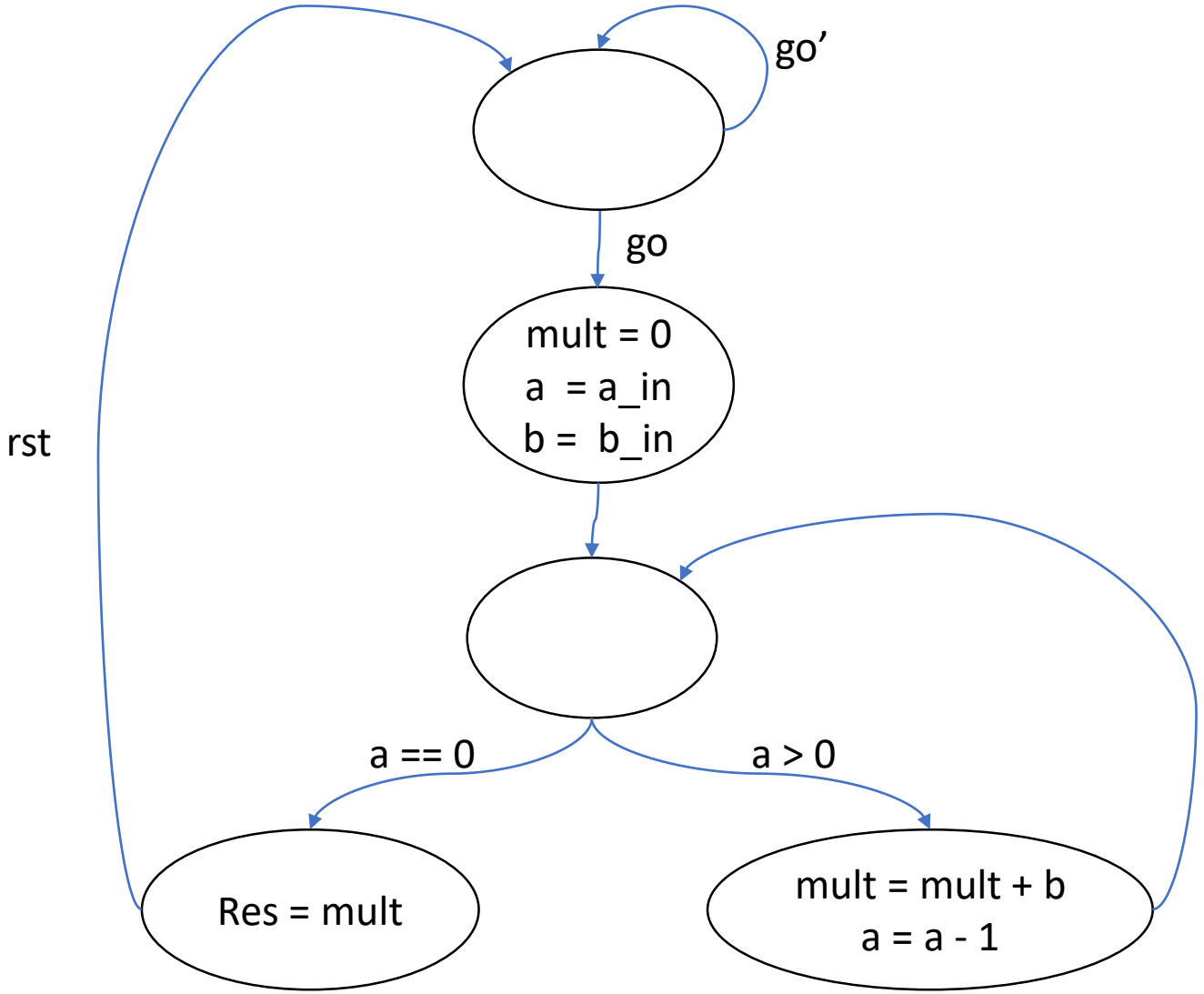
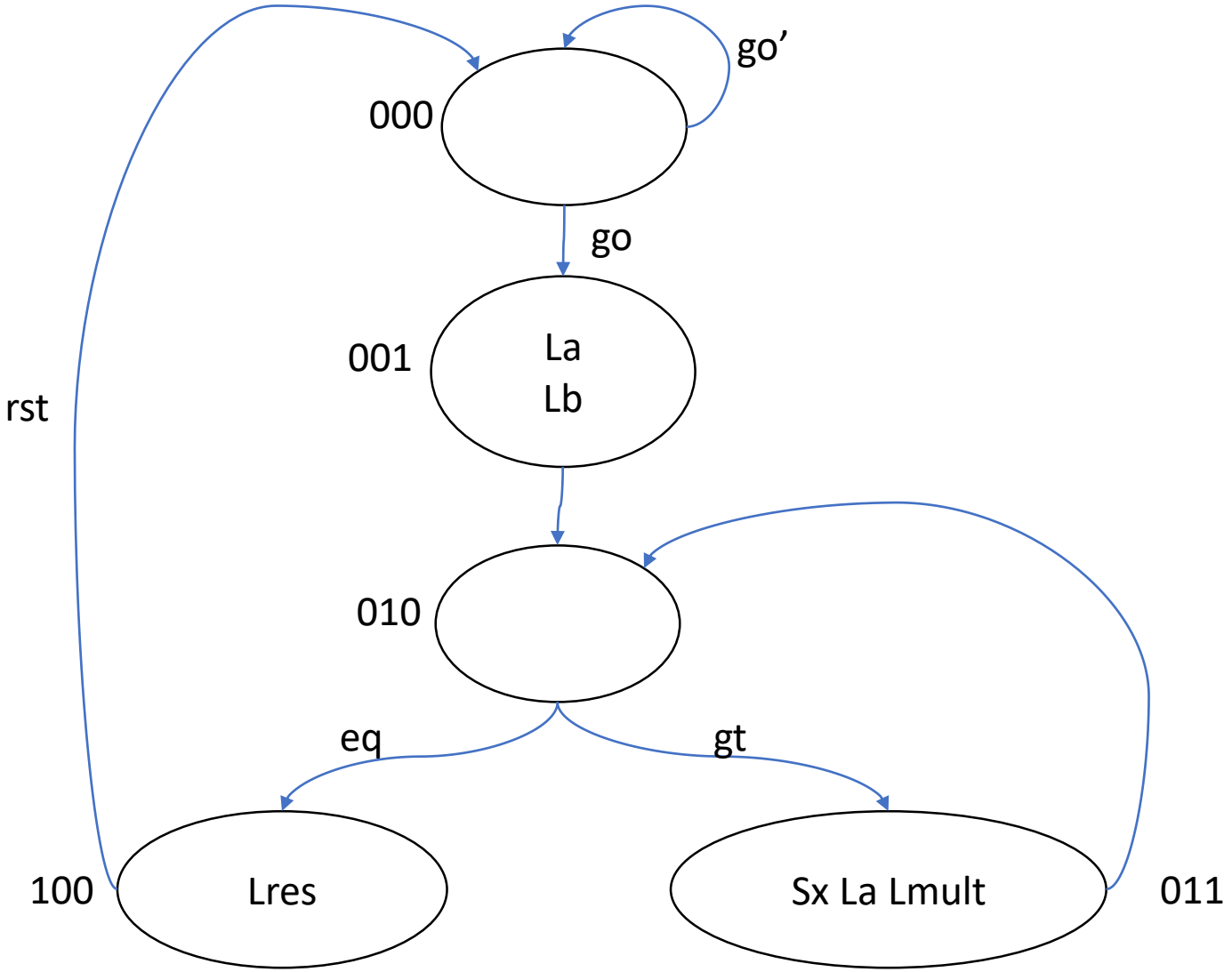
CSE232
Project 2 Report
Muhammed Eyüp
1801042679

Data Path Diagram



FSM Diagram



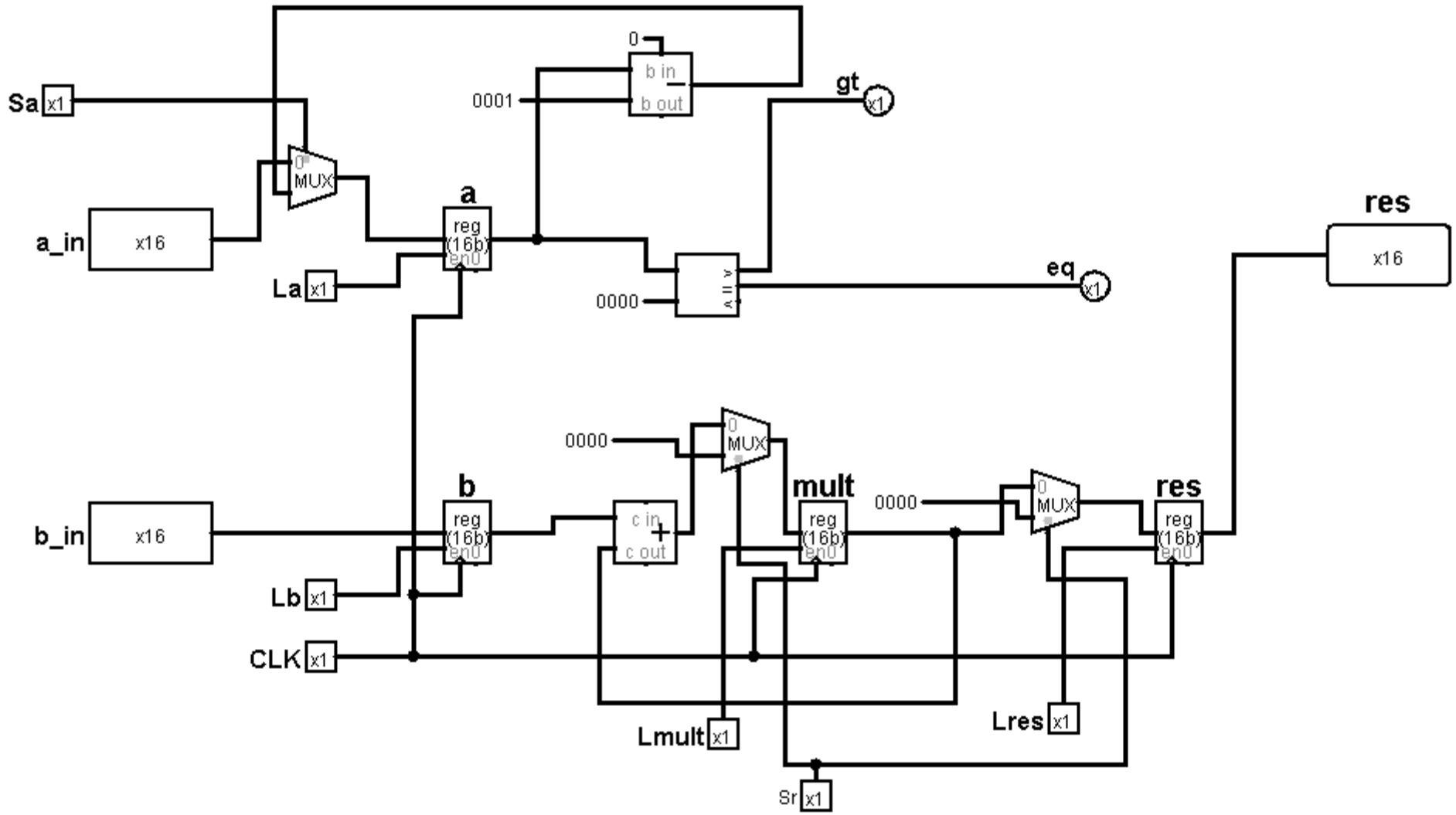
Pstates S2 S1 S0	Inputs gt eq go	Nstates N2 N1 N0
000	- - 0	000
000	- - 1	001
001	- - -	010
010	1 0 -	011
011	- - -	010
010	0 1 -	100
100	- - -	000

N0 = S2’ S1’ S0’ go+ S2’ S1 S0’ gt eq’
N1 = S2’ S1’ S0 + S2’ S1 S0’ gt eq’ + S2’ S1 S0 = S2’ S0 + S2’ S1 S0’ gt eq’
N2 = S2’ S1 S0’ gt’ eq

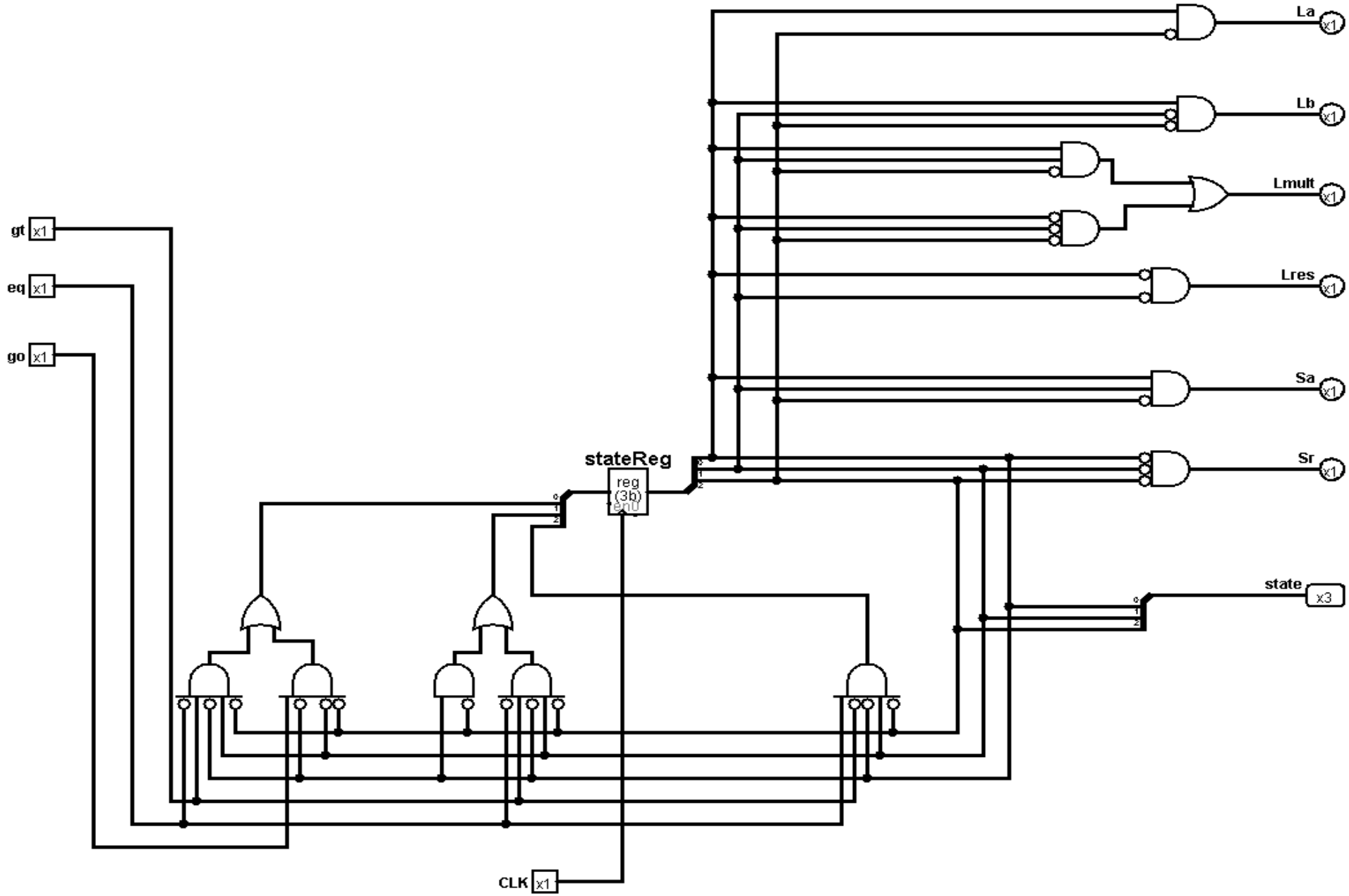
Pstates S2 S1 S0	OUTPUTS La Lb Lmult Lres Sa Sr
000	0 0 1 1 0 1
001	1 1 0 0 0 0
010	0 0 0 0 0 0
011	1 0 1 0 1 0
100	0 0 0 1 0 0

La = S2’S1’S0 + S2’S1S0 = S2’ S0
Lb = S2’S1’S0
Lmult = S2’S1 S0 + S2’ S1’ S0’
Lres = S2 S1’S0’ + S2’ S1’ S0’ = S1’ S0’
Sa = S2’S1 S0
Sr = S2’ S1’ S0’

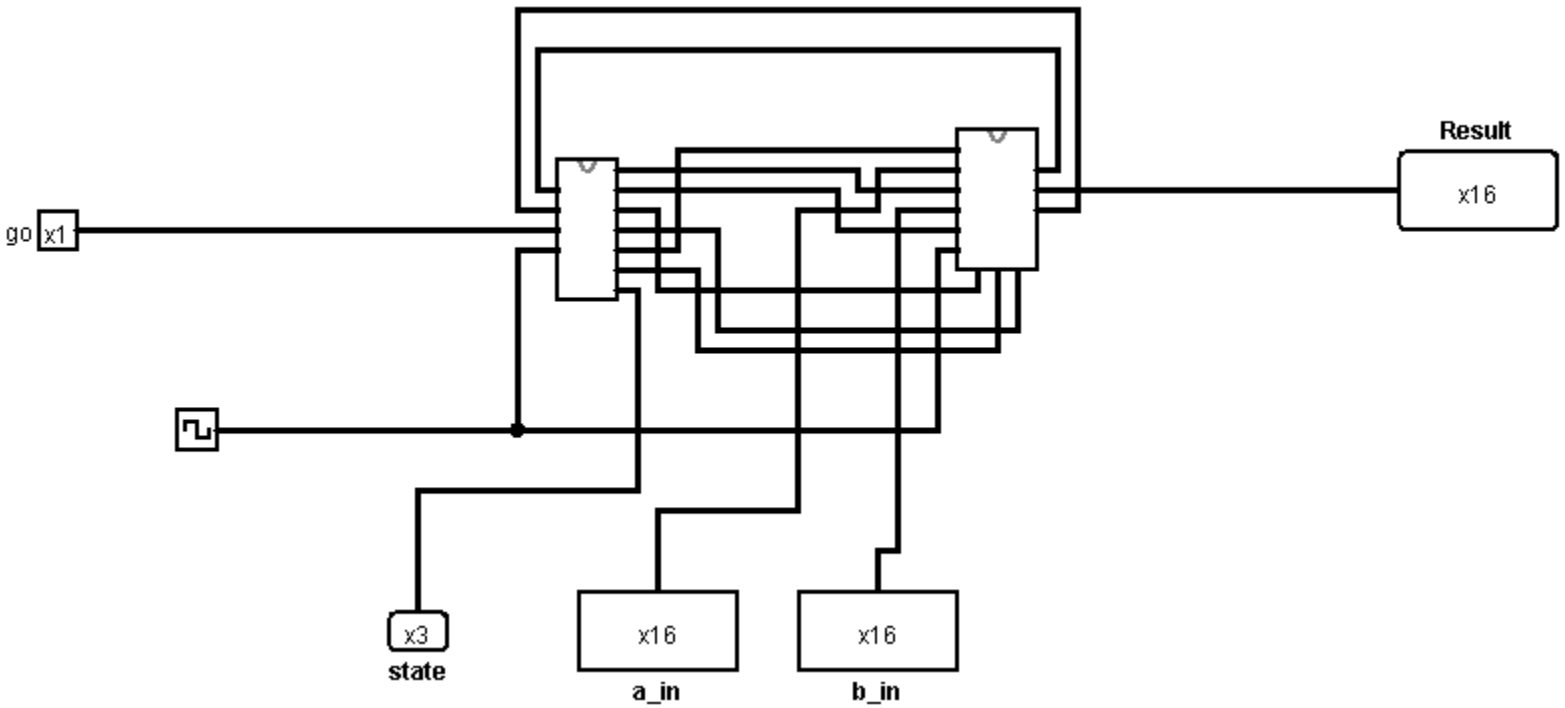
Datapath circuit



FSM circuit


gt
x1
eq
x1
go
x1
stateReg
reg
(3b)
en
CLK
x1
La
x1
Lb
x1
Lmult
x1
Lres
x1
Sa
x1
Sr
x1
state
x3

main circuit



Project Report:

The project is a 16bit number multiplier. The circuit can multiply any 16bit positive numbers. The circuit contains a datapath that uses adders an subtractors to calculate the product of two numbers