

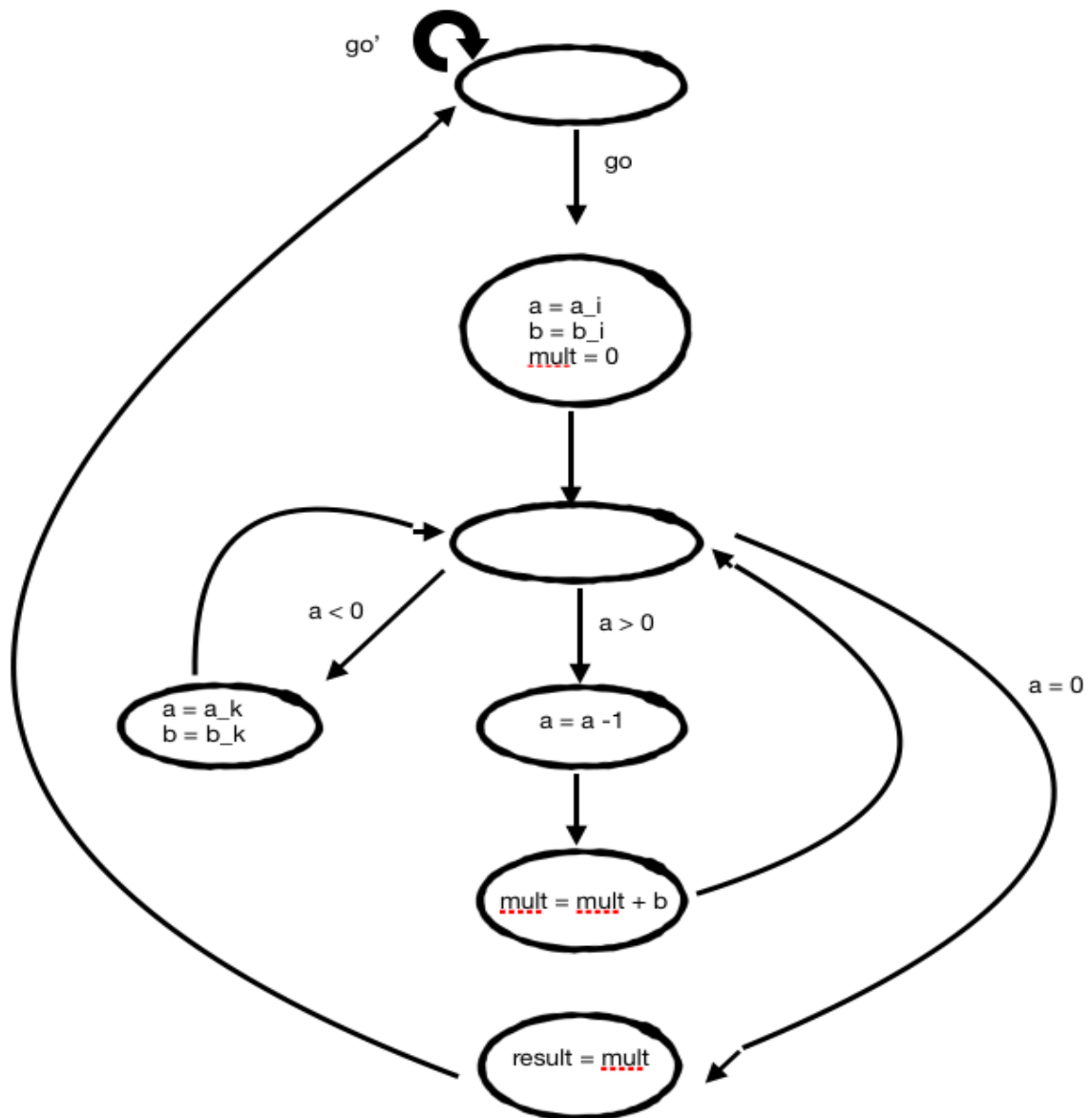
PROJECT 2

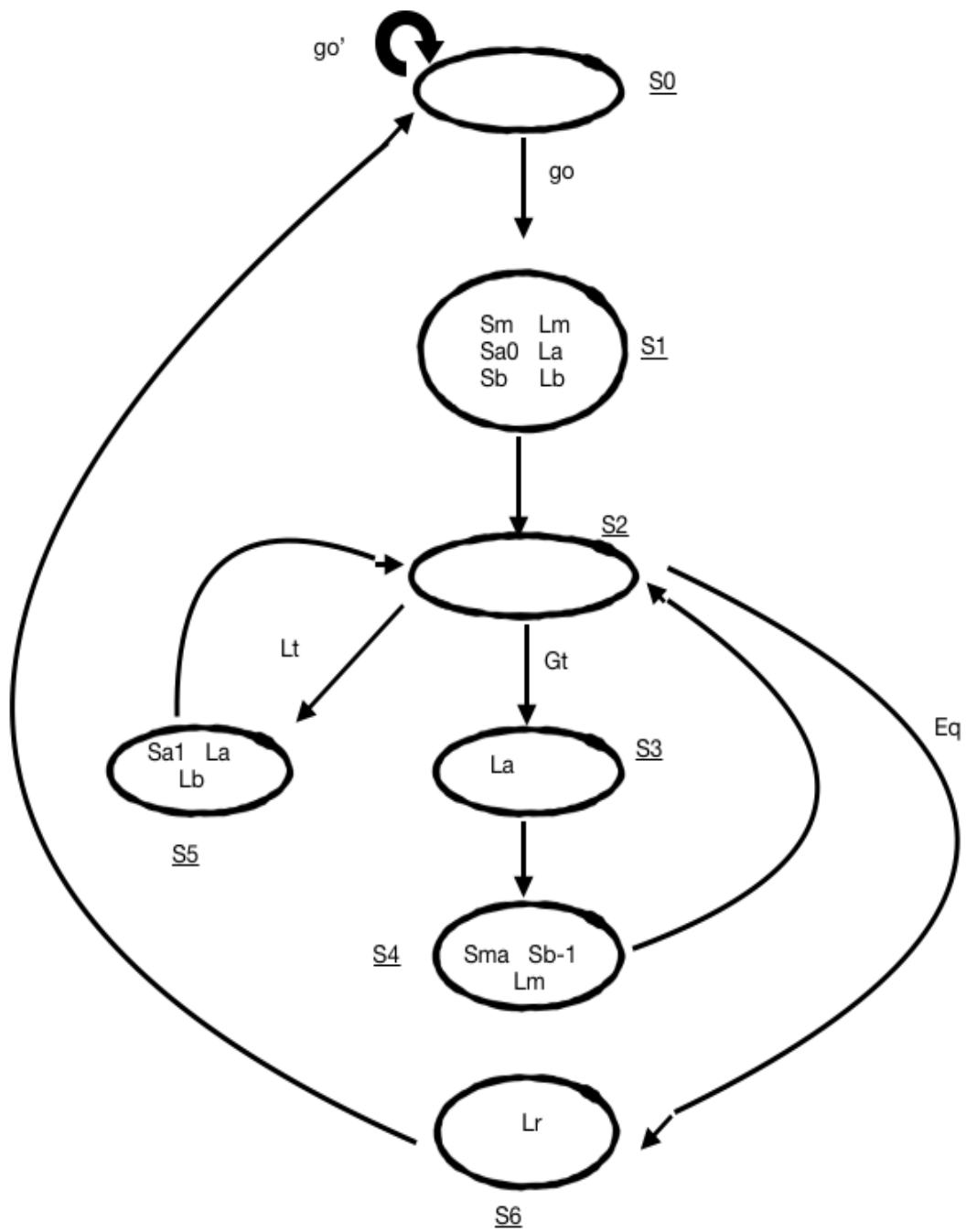
REPORT

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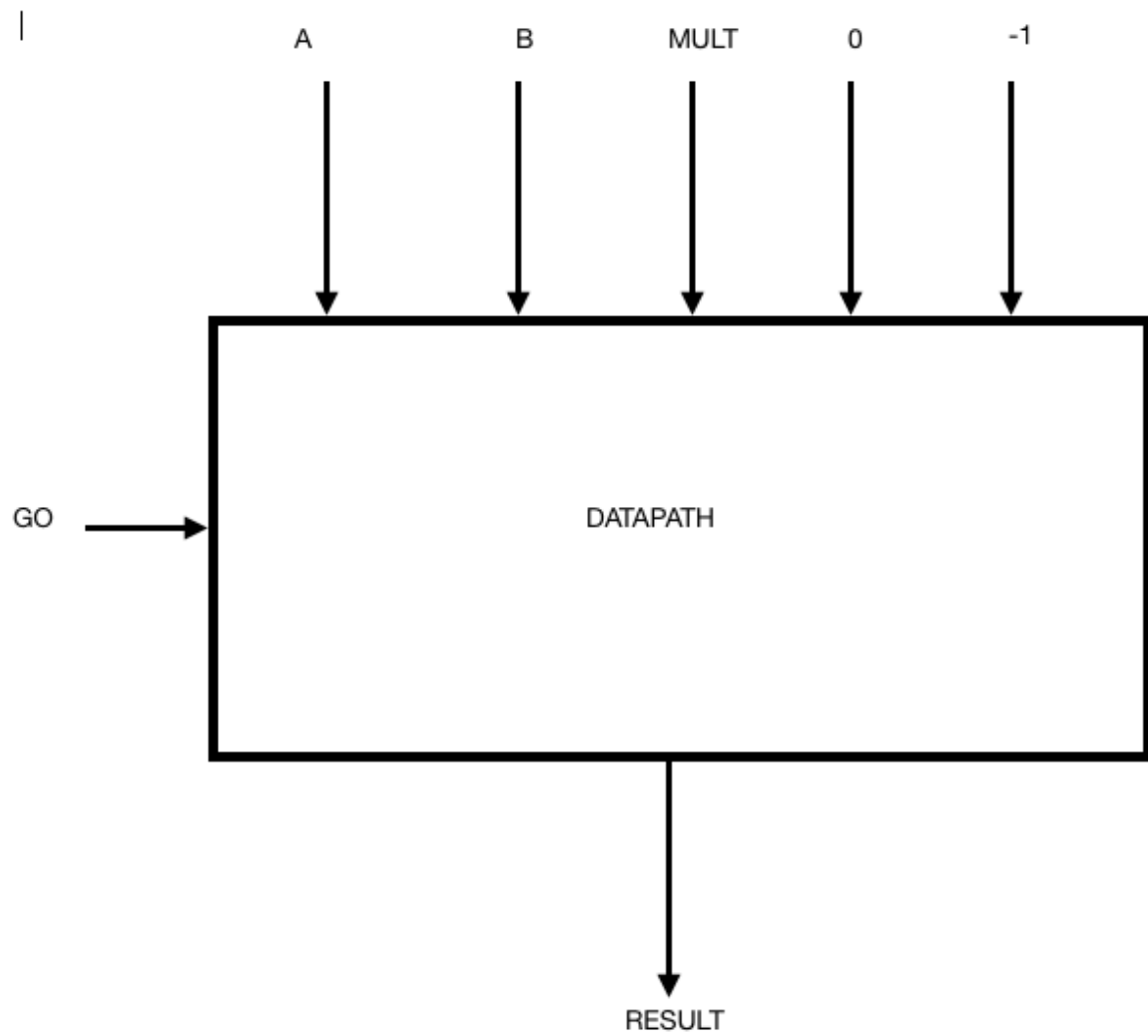
1. STATE DIAGRAM





Values that are 0 in the state diagram are not shown.

2. DATAPATH



3. TRUTH TABLE

INPUT			OUTPUT									
P2	P1	P0	Sm	Sa1	Sa0	Sb	Sma	Sb-1	Lm	La	Lb	Lr
S0			0	0	0	0	0	0	0	0	0	0
S1			1	0	1	1	0	0	1	1	1	0
S2			0	0	0	0	0	0	0	0	0	0
S3			0	0	0	0	0	0	0	1	0	0
S4			0	0	0	0	1	1	1	0	0	0
S5			0	1	0	0	0	0	0	1	1	0
S6			0	0	0	0	0	0	0	0	0	1

$Sm = S1$ $Sma = S4$ $Lb = S1 + S5$ $S1 = 001$ $S3 = 011$
 $Sa1 = S4$ $Sb-1 = S4$ $Lr = S6$ $S4 = 100$ $S5 = 101$
 $Sa0 = S1$ $Lm = S1 + S4$ $S6 = 110$
 $Sb = S1$ $La = S1 + S3 + s5$

Ps	INPUTS				Ns		
P2 P1 P0	Lt	Gt	Eq	Go	N2	N1	N0
000	-	-	-	0	0	0	0
000	-	-	-	1	0	0	1
001	-	-	-	-	0	1	0
010	1	0	0	-	1	0	1
101	-	-	-	-	0	1	0
010	0	1	0	-	0	1	1
011	-	-	-	-	1	0	0
100	-	-	-	-	0	1	0
010	0	0	1	-	1	1	0
110	-	-	-	-	0	0	0

$$N2 = P2'P1P0'Lt + P2'P1P0 + P2'P1P0'Eq$$

$$N1 = P2'P1'P0 + P2P1'P0 + P2'P1P0'Gt + P2P1'P0' + P2'P1P0'Eq$$

$$= P2'P1P0'(Gt + Eq) + P2P1' + P2'P1'P0$$

$$N0 = P2'P1'P0'Go + P2'P1P0'Lt + P2'P1P0'Gt$$

$$= P2'P1'P0'Go + P2'P1P0'(Lt + Gt)$$

The project finds the product of all negative and positive 16-bit numbers.