CSE 232 SPRING 2020 PROJECT 2

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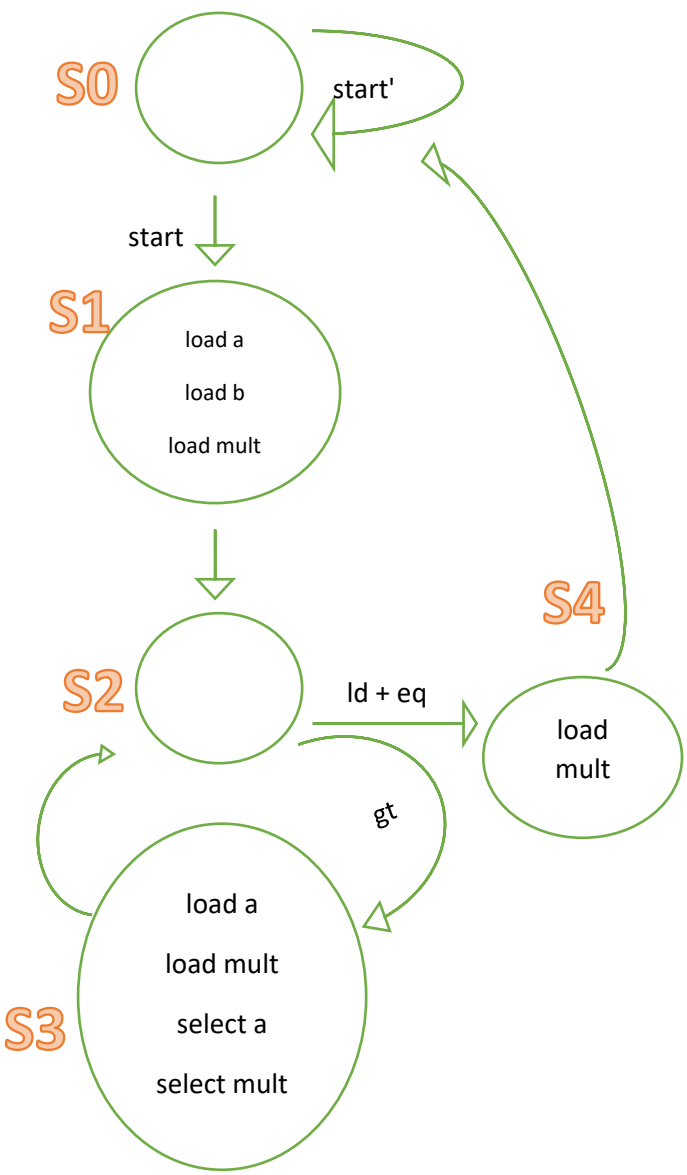
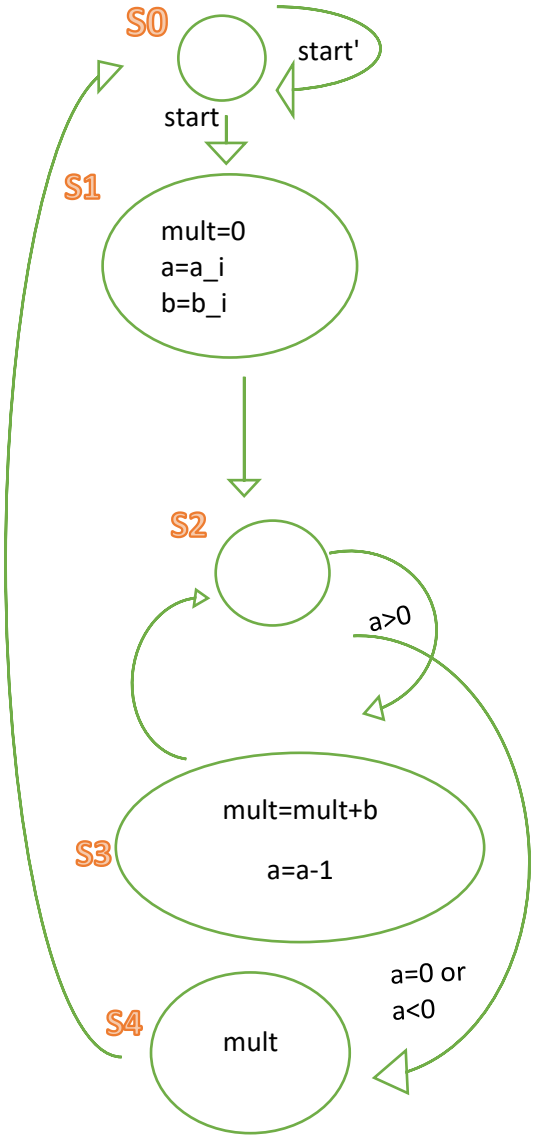
C code with my machine;

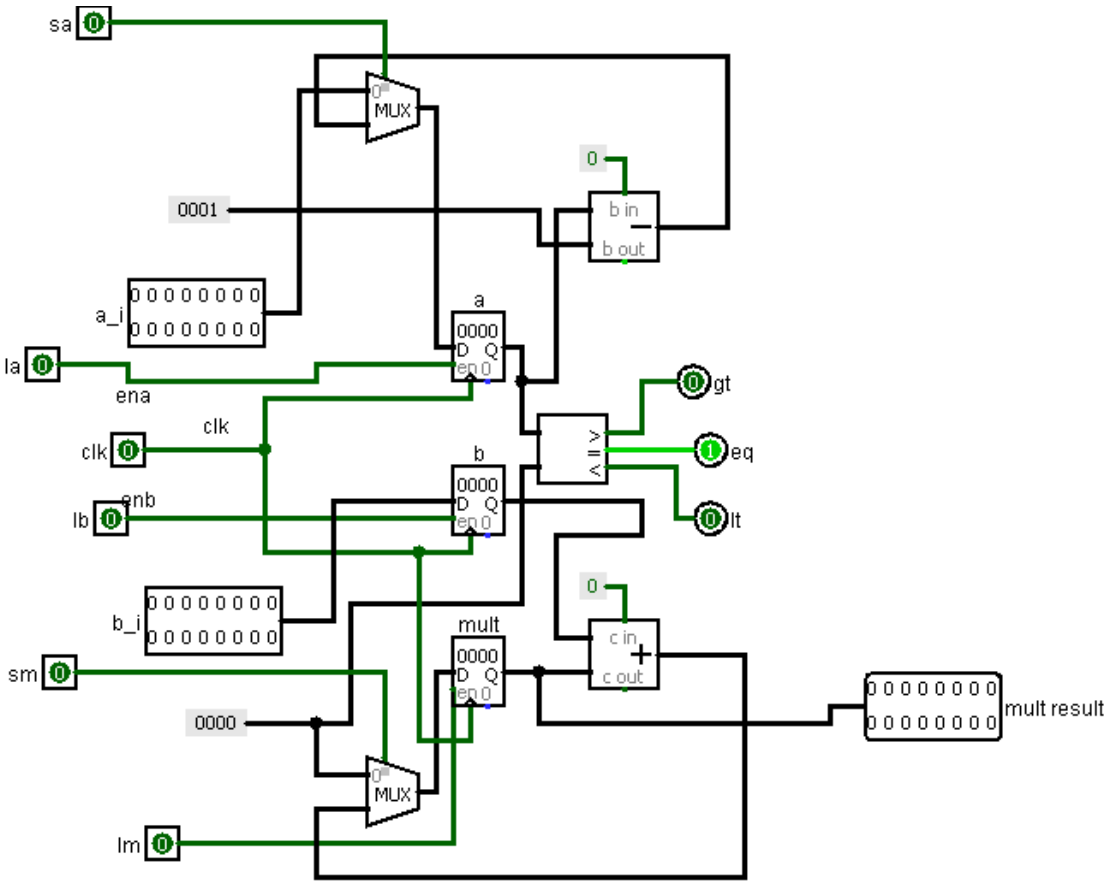
```
mult = 0;
while( a > 0 ){
mult = mult + b;
a = a – 1;
}
```

The state diagram for my FSM controller;





Datapath;



Truth tables;

Present	***States***		***Inputs***				***Next***	***States***	
P2	P1	P0	Lt	Gt	Eq	Start	N2	N1	N2
0	0	0	-	-	-	0	0	0	0
0	0	0	-	-	-	1	0	0	1
0	0	1	-	-	-	-	0	1	0
0	1	0	0	1	0	-	0	1	1
0	1	0	1	0	0	-	1	0	0
0	1	0	0	0	1	-	1	0	0
0	1	1	-	-	-	-	0	1	0
1	0	0	-	-	-	-	0	0	0

States			***Outputs***				
P2	P1	P0	Sa	La	Lb	Sm	Lm
0	0	0	0	0	0	0	0
0	0	1	0	1	1	0	1
0	1	0	0	0	0	0	0
0	1	1	1	1	0	1	1
1	0	0	0	0	0	0	1

Boolean expressions from the truth table;

N2=P0'P0'P1.Lt+P2'P0'P1.Eq=P2'P0'P1(lt+Eq)

N1=P2'P1'P0+P2'P0'P1gt+P2'P1P0=P2'(P1'P0+ P0'P1gt +P1P0)

N0=P2'P0'P1'.Start+P2'P0'P1Gt=P2'P0'(P1'Start+P1Gt)

Sa=S3

La=S1+S3

Lb=S1

Sm=S3

Lm=S1+S3+S4

	P2	*P1*	*P0*
S0	*0*	*0*	*0*
S1	*0*	*0*	*1*
S2	*0*	*1*	*0*
S3	*0*	*1*	*1*
S4	*1*	*0*	*0*