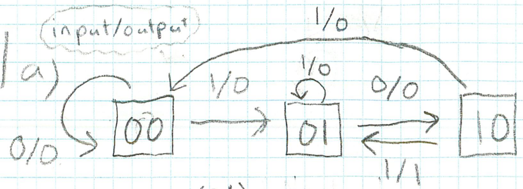
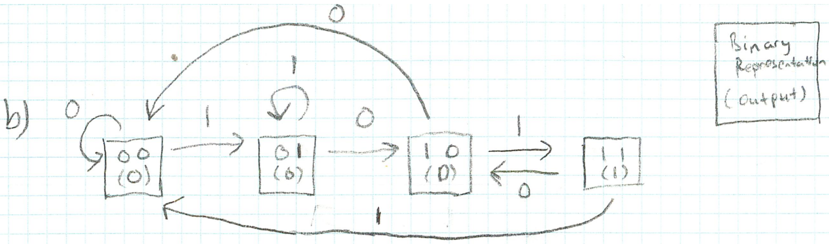
Bryant Har bjh254

Q1) a)



b)



c)

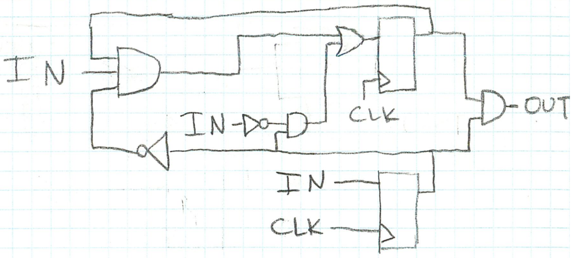
Current	Next (IN) 0	1	Output
00	00	01	0
01	10	01	0
10	00	11	0
11	10	01	1

d) K-Map for B_0

$B_0 B_1$ \ IN	0	1
00	0	0
01	1	0
11	1	0
10	0	1

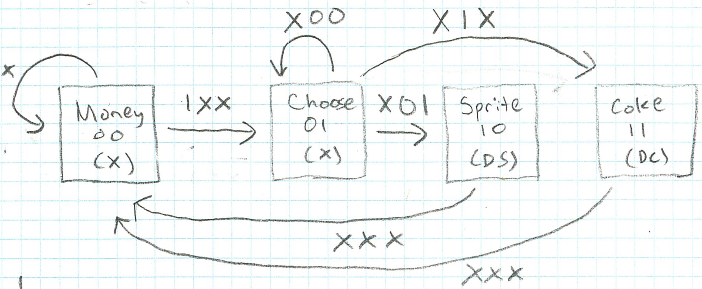
$B_{0,next} = IN' \cdot B_1 + IN \cdot B_1' \cdot B_0$

$B_{1,next} = IN$ clearly.



Q2) a)

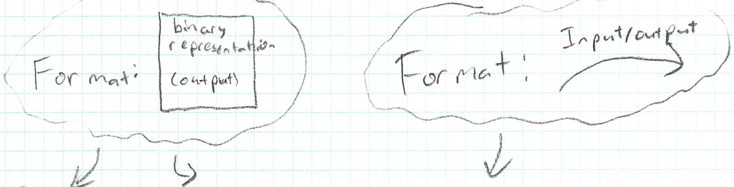
Input:
Money/Coke/Sprite



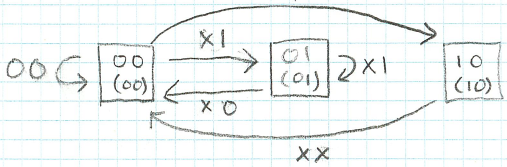
b)

Current	Next s' 000	001	010	011	100	101	110	111 ← IN	Output
00	00	00	00	00	01	01	01	01	X
01	XX	XX	XX	XX	01	10	11	11	X
10	00	00	00	00	00	00	00	00	DS
11	00	00	00	00	00	00	00	00	DC

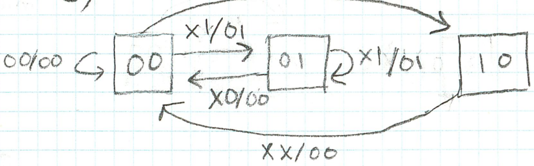
c) see second page



Q3) a) Format: Input = S1,S2 Output = O1,O2
State = D1,D2



b)



c)

Current	Next $D_1^* D_2^*$ 00	01	10	11	Output
00	00	01	10	01	00
01	00	01	00	01	01
10	00	00	00	00	10
11	XX	XX	XX	XX	XX
$S_1 S_2$					$D_1 D_2$

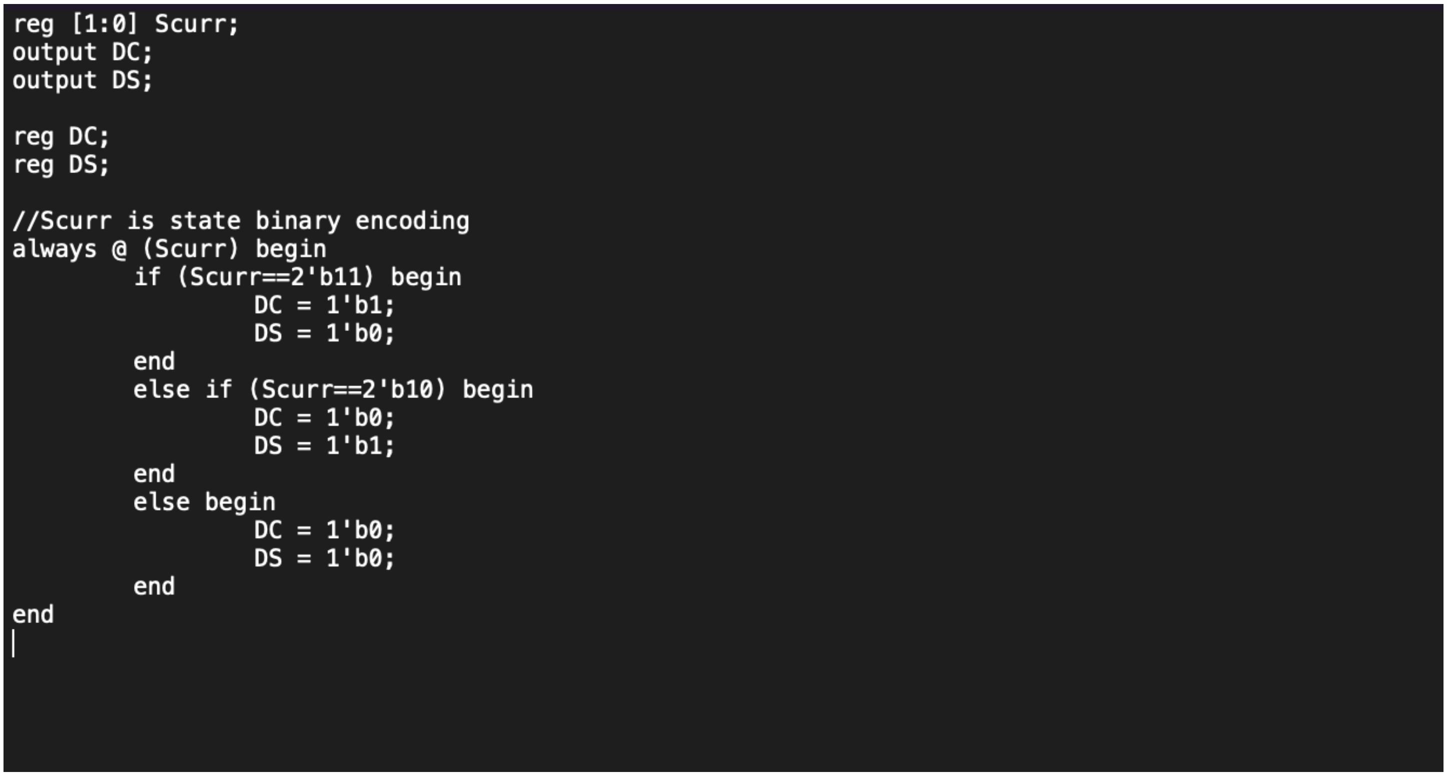
$D_1 D_2$ \ $S_1 S_2$	00	01	11	10
00	00	00	X	00
01	01	01	X	00
11	01	01	X	00
10	10	00	X	00

$D_{1,next} = S_1' \cdot D_2$

$D_{2,next} = S_1' \cdot S_2' \cdot D_1 \cdot D_2'$

equations for state transition and output are same since state encodings are the outputs

$O_1 = D_1$ $O_2 = D_2$



```
reg [1:0] Scurr;
output DC;
output DS;

reg DC;
reg DS;

//Scurr is state binary encoding
always @ (Scurr) begin
        if (Scurr==2'b11) begin
                DC = 1'b1;
                DS = 1'b0;
        end
        else if (Scurr==2'b10) begin
                DC = 1'b0;
                DS = 1'b1;
        end
        else begin
                DC = 1'b0;
                DS = 1'b0;
        end
end
```