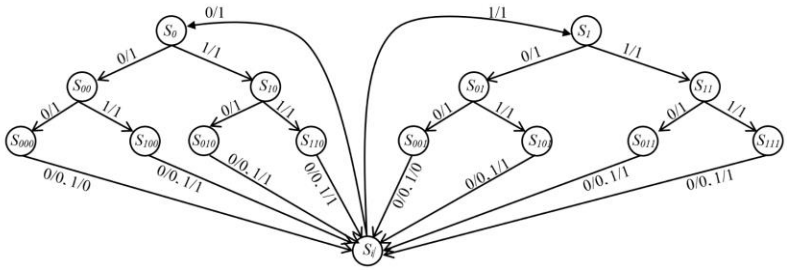
1. Mealy model example
    a. Design a circuit

    b. State transition diagram

2. Minimizing a Mealy model



a. P_1

b. P_2

c. P_3

d. P_4

e. P_5

3. Implementing the FSM

State transition diagram

Present State	Next State		Output	
	x = 0	x = 1	x = 0	x =1
i				
*****				
0*				
1*				
00*				
~(00*)				

State table

4. Optimal assignment of binary codes

a. Rule of thumb for state binary code assignments

b. Assign using the rules above

Present State	Next State		Output	
	x = 0	x = 1	x = 0	x =1
i	*	*	1	1
*****	0*	1*	1	1
0*	00*	~(00*)	1	1
1*	~(00*)	~(00*)	1	1
00*	*i*	*i*	0	0
~(00*)	*i*	*i*	0	1

Binary Code AB

C	**00**	**01**	**11**	**10**
0				
1				

c. Note that there may potentially be more than one valid code assignment that minimizes distance

d. Make state transition table from the above with assigned binary codes

Present State	Next State		Output	
	x = 0	x = 1	x = 0	x =1
i	*	*	1	1
*****	0*	1*	1	1
0*	00*	~(00*)	1	1
1*	~(00*)	~(00*)	1	1
00*	*i*	*i*	0	0
~(00*)	*i*	*i*	0	1

Binary Code	AB			
	00	**01**	**11**	**10**
C **0**	*i*	*	0*	00*
1	~(00*)	1*		

Present State	Binary Code	Present State			Input	Next State			Output
		A	***B***	***C***	***x***	***A'***	***B'***	***C'***	***z***
	000	0	0	0					
	000	0	0	0					
	001	0	0	1					
	001	0	0	1					
	010	0	1	0					
	010	0	1	0					
	011	0	1	1					
	011	0	1	1					
	100	1	0	0					
	100	1	0	0					
	101	1	0	1					
	101	1	0	1					
	110	1	1	0					
	110	1	1	0					
	111	1	1	1					
	111	1	1	1					

e. Create K-maps for each flip flop based on input and present state in table above
f. Create a K-Map based on flip-flops to determine the output combinational circuit

Present State	Binary Code	Present State			Input	Next State			Output
		A	*B*	*C*	*x*	*A'*	*B'*	*C'*	*z*
i	000	0	0	0	0	0	1	0	1
i	000	0	0	0	1	0	1	0	1
~(00*)	001	0	0	1	0	0	0	0	0
~(00*)	001	0	0	1	1	0	0	0	1
*****	010	0	1	0	0	1	1	0	1
*****	010	0	1	0	1	0	1	1	1
1*	011	0	1	1	0	0	0	1	1
1*	011	0	1	1	1	0	0	1	1
00*	100	1	0	0	0	0	0	0	0
00*	100	1	0	0	1	0	0	0	0
	101	1	0	1	0	d	d	d	d
	101	1	0	1	1	d	d	d	d
0*	110	1	1	0	0	1	0	0	1
0*	110	1	1	0	1	0	0	1	1
	111	1	1	1	0	d	d	d	d
	111	1	1	1	1	d	d	d	d

A' AB

Cx	00	01	11	10
00				
01				
11				
10				

B' AB

Cx	00	01	11	10
00				
01				
11				
10				

C' AB

Cx	00	01	11	10
00				
01				
11				
10				

z AB

Cx	00	01	11	10
00				
01				
11				
10				

g. Use derivations from the K-maps to design initial combinational circuit