

BLG 311E – FORMAL LANGUAGES AND AUTOMATA  
SPRING 2014  
QUIZ 1

Transform the incompletely specified Mealy machine below into the Moore model and reduce the states of the new machine using complete cover.

	00	01	11	10
a	a / 0	b / 0	c / 0	d / 1
b	b / 0	- / -	c / 0	- / -
c	a / 0	f / 0	c / 0	- / -
d	d / 0	- / -	e / 0	a / 0
e	e / 0	g / 0	d / 0	b / 0
f	- / -	f / 0	- / -	a / 0
g	- / -	g / 0	e / 0	c / 0

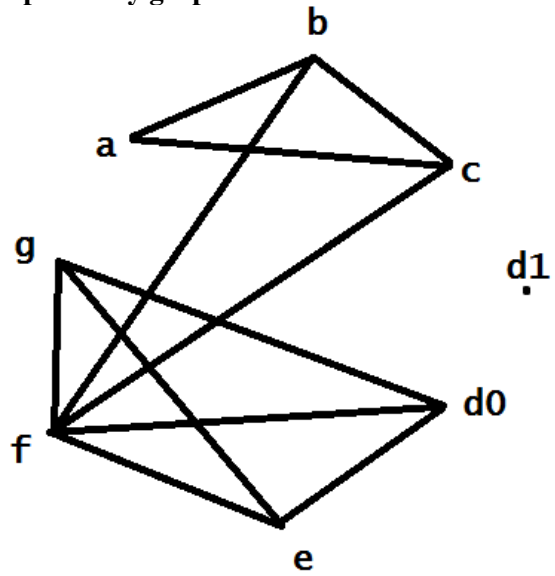
### SOLUTION

### Mealy $\rightarrow$ Moore:

	00	01	11	10	Output
<b>a</b>	a	b	c	d <sub>1</sub>	0
<b>b</b>	b	-	c	-	0
<b>c</b>	a	f	c	-	0
<b>d<sub>0</sub></b>	d <sub>0</sub>	-	e	a	0
<b>e</b>	e	g	d <sub>0</sub>	b	0
<b>f</b>	-	f	-	a	0
<b>g</b>	-	g	e	c	0
<b>d<sub>1</sub></b>	d <sub>0</sub>	-	e	a	1

[illegible]

Dependency graph:



Complete cover:

$$S_1 = \{a, b, c\}$$

$$S_2 = \{d_0, e, f, g\}$$

$$S_3 = \{b, c, f\}$$

$$S_4 = \{d_1\}$$

Reduced State Transition Table:

	00	01	11	10	Output
S1	S1	S3	S1,S3	S4	0
S2	S2	S2	S2	S1	0
S3	S1	S2,S3	S1,S3	S1	0
S4	S2	-	S2	S1	1