

Informatics 1

Computation and Logic

A Traffic-Light Controller

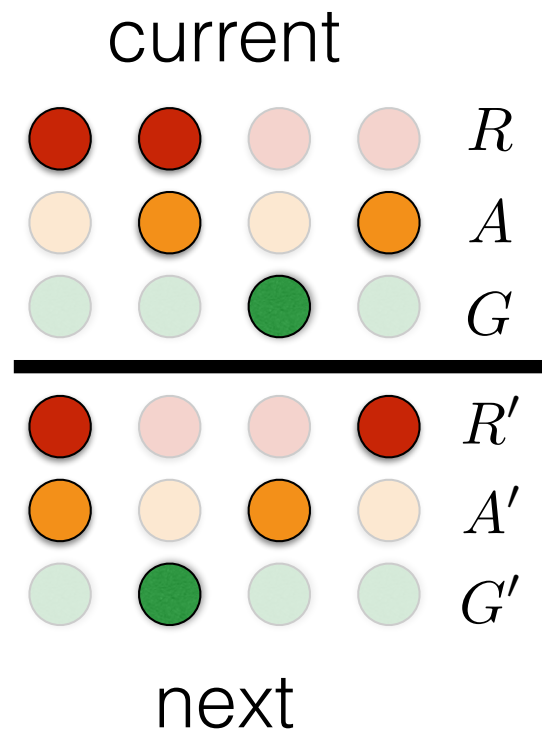
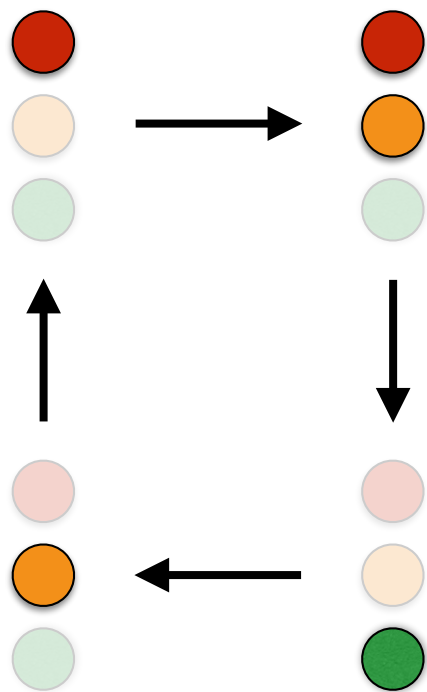
Michael Fourman

red

amber

green



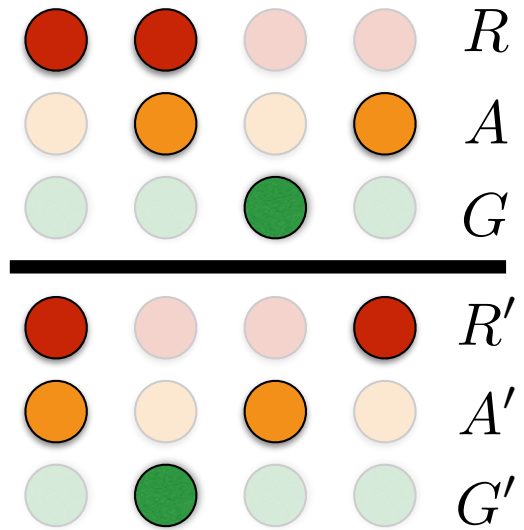


$$R' = R \text{ xor } A = R \oplus A$$

$$A' = \text{not } A = \neg A$$

$$G' = R \text{ and } A = R \wedge A$$

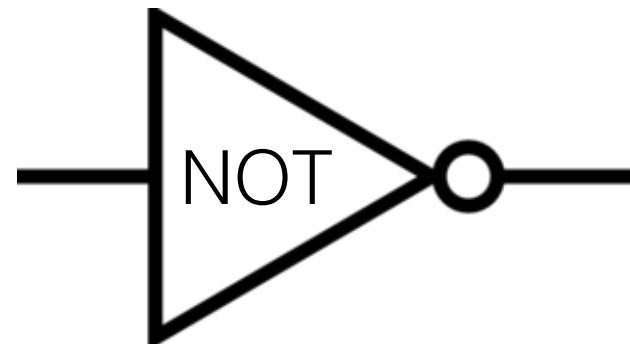
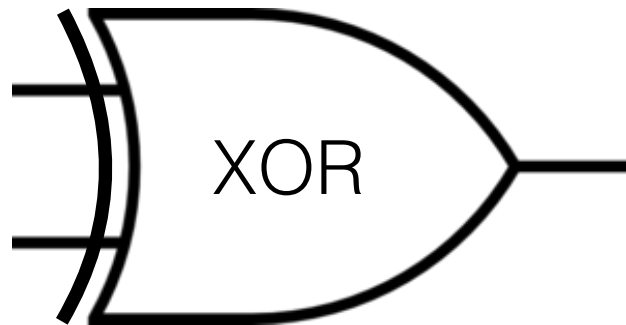
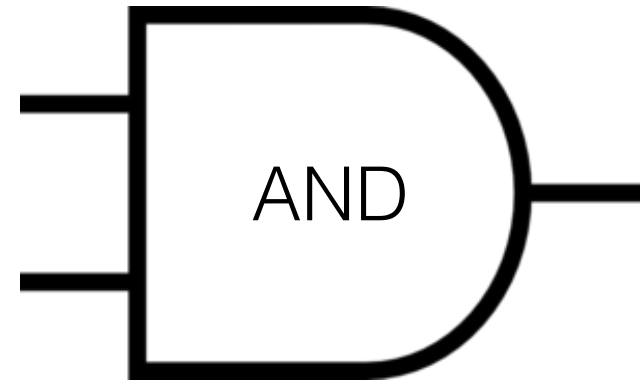
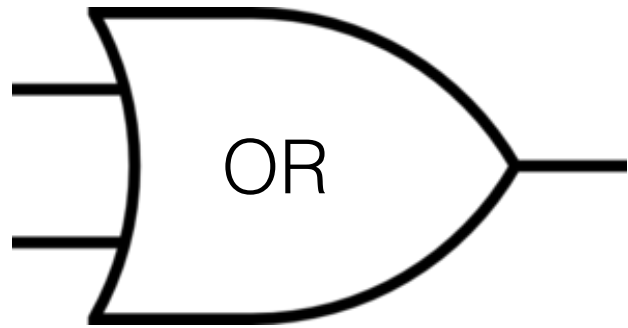
current

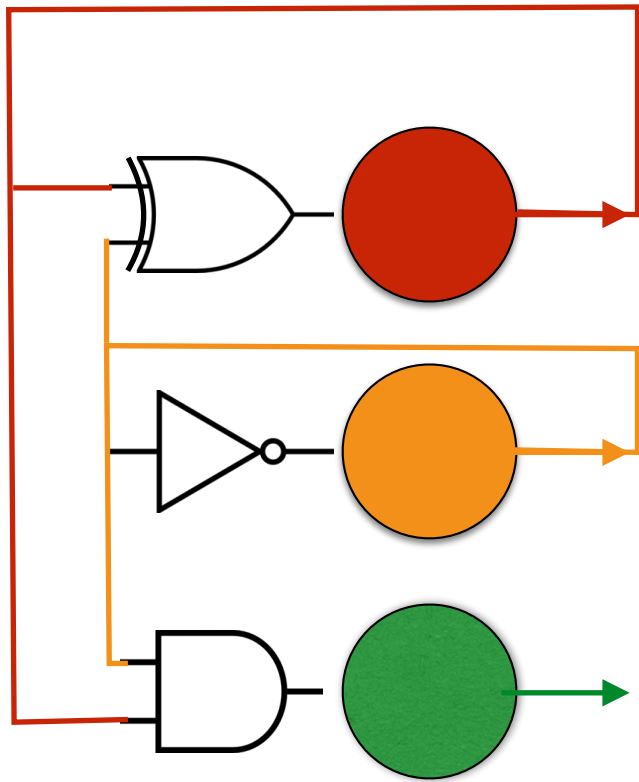


next

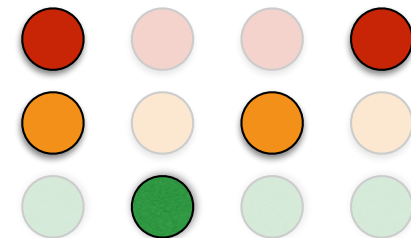
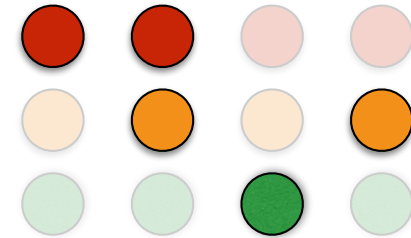
R	A	$R \wedge A$	$R \oplus A$
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	0

A	$\neg A$
0	1
1	0





current

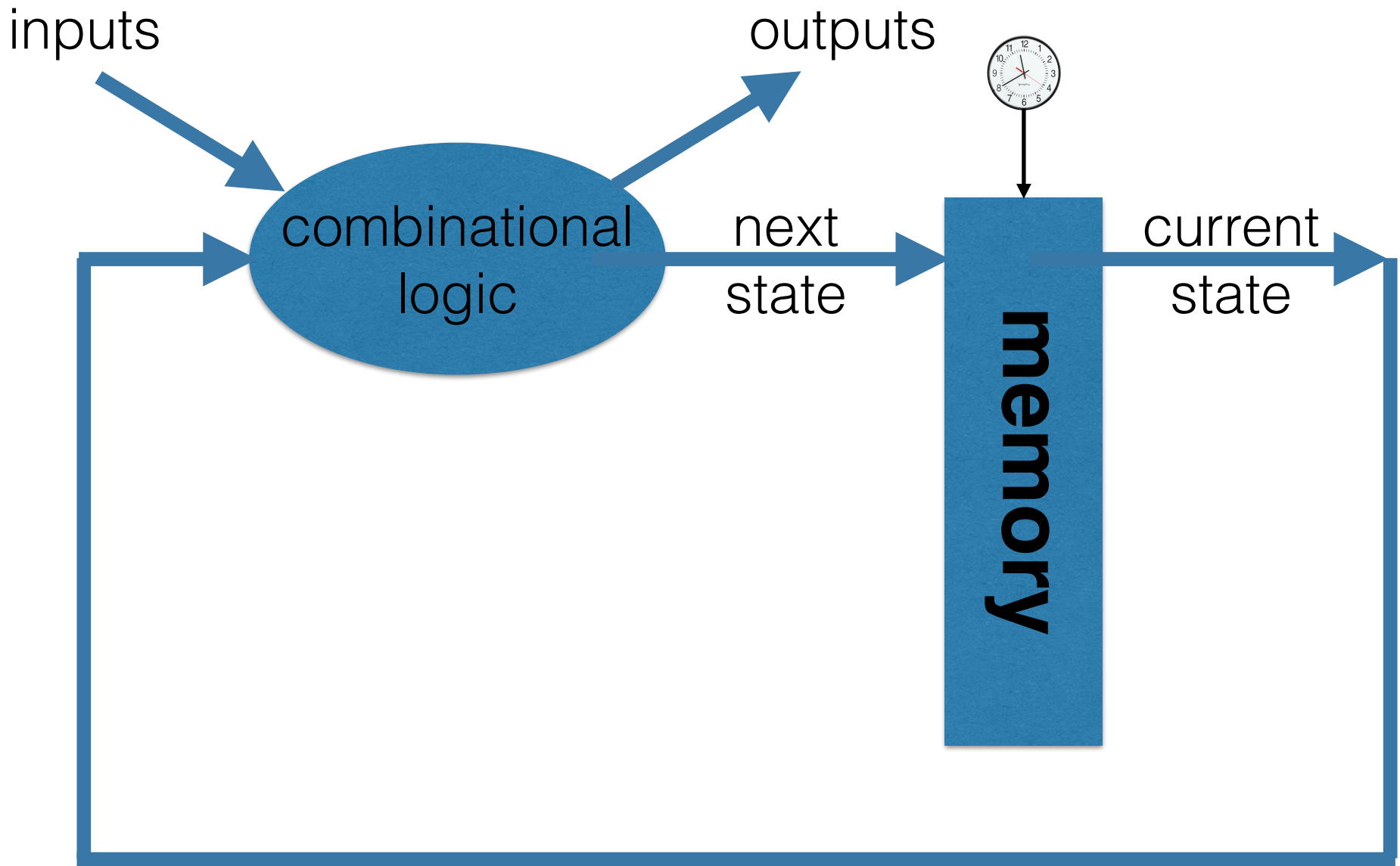


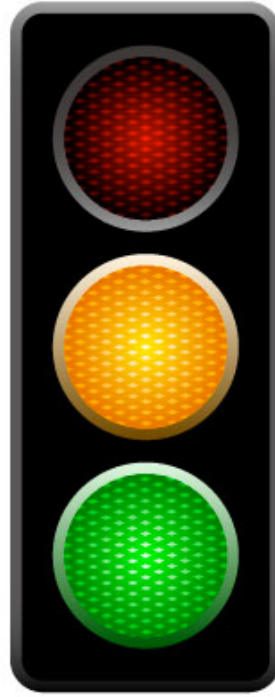
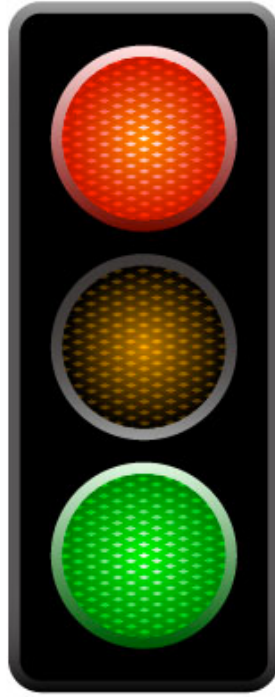
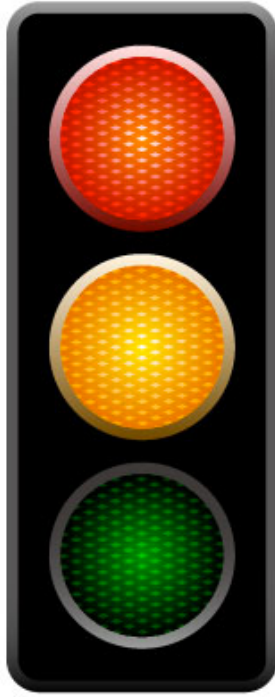
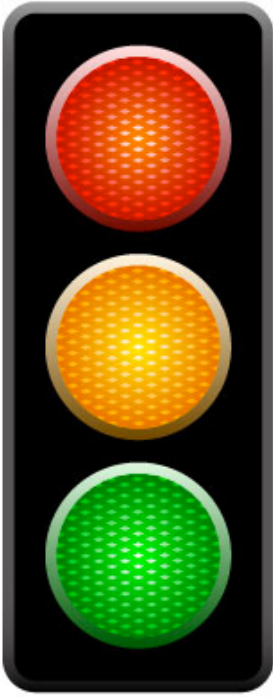
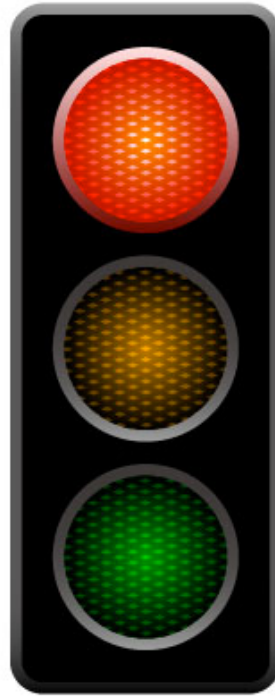
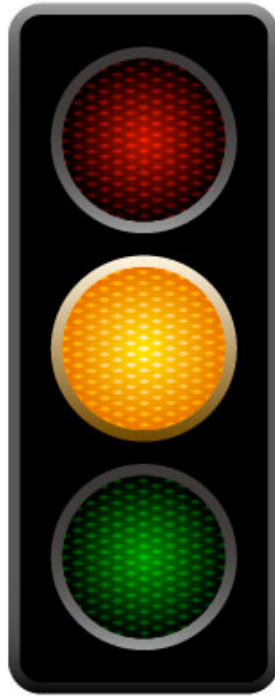
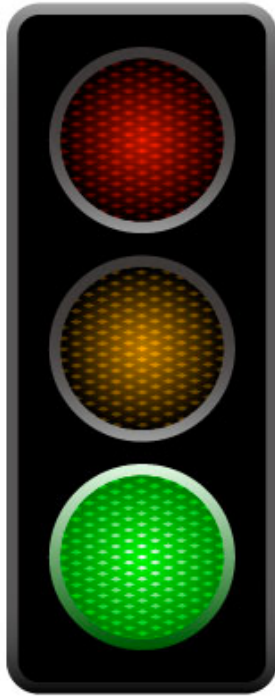
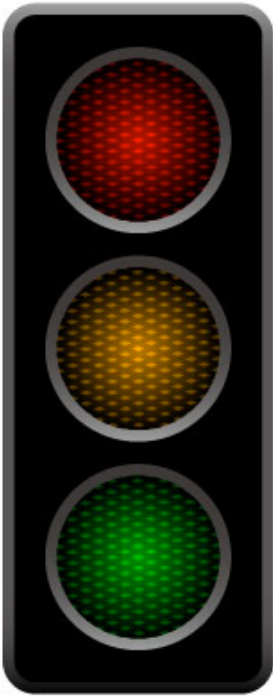
next

$$R' = R \text{ xor } A$$

$$A' = \text{not } A$$

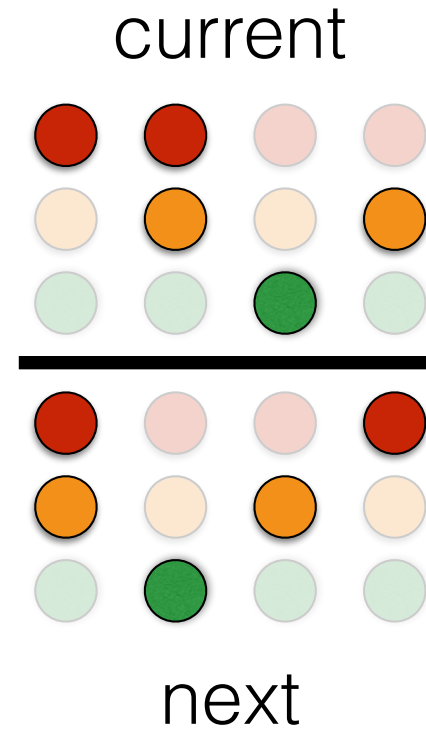
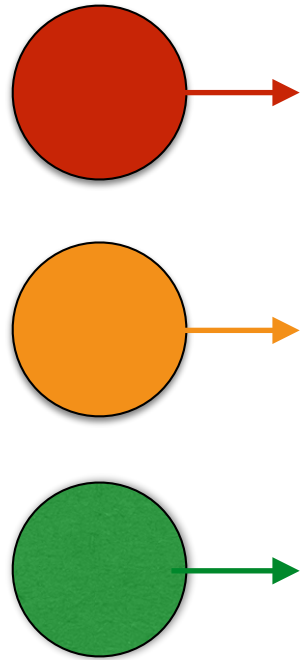
$$G' = R \text{ and } A$$







Exercise 1.1



$$R' = R \text{ xor } A$$

$$A' = G \text{ or } (R \text{ and not } A)$$

$$G' = R \text{ and } A$$

Exercise 1.2

1	1
1	1

$A \vee B$

0	1
1	1

1	1
1	0

1	0
1	1

1	1
0	1

$A \rightarrow B$

$\neg A$

1	1
0	0

0	0
1	1

0	1
1	0

1	0
0	1

1	0
1	0

0	1
0	1

B

0	1
0	0

0	0
1	0

1	0
0	0

0	0
0	1

$A \wedge B$

0	0
0	0

11

Exercise 1.3

