CISP 440

Austin Smothers

Homework 13

# Section 10.1

b/0

a/0

a/1

b/1

b/1

a/1

a/2

b/0

c/1

c/2

a/2

b/0

c/2

c/0

b/0

a/1

1. *I*: {a, b} *O*: {0, 1} *S*: {A, B} Initial state: A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **f** | | **g** | |
| *I* | **a** | **b** | **a** | **b** |
| *S* |
| A | A | B | 0 | 1 |
| B | A | C | 0 | 1 |
| C | C | A | 1 | 0 |

1. *I*: {a, b, c} *O*: {0, 1, 2} *S*: {A, B, C, D} Initial State: B

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **f** | | | **g** | | |
| *I* | **a** | **b** | **c** | **a** | **b** | **c** |
| *S* |
| A | B | A | C | 1 | 0 | 2 |
| B | A | D | D | 2 | 0 | 0 |
| C | A | C | D | 0 | 1 | 2 |
| D | D | C | A | 2 | 2 | 0 |

# Section 10.1 continued…

1. *abba* (Exercise 2) 🡪 **0100**
2. *aaa* (Exercise 6) 🡪 **011**
3. *aabbabaab* (Exercise 7) 🡪 **001110001**
4. *bbababbabaaa* (Exercise 9) 🡪 **010000000001**
5. Outputs 1 if *k* 1’s have been input, where *k* is a multiple of 3; otherwise, outputs 0

0/0

0/0

1/0

1/1

1/0

0/0

1. Outputs 1 when it sees 101 and thereafter; otherwise, outputs 0

0/0

1/0

1/1

0/1

0/0

1/1

1/0

0/0

# Section 10.2

a

b

a

b

b

a

1. *aabaaabb* (Figure 10.2.5)

0000001 = **accepted**

1. Contains *m* a’s, where *m* is a multiple of 3

a

b

b

b

a

b

a

a

1. Every *b* is followed by *a*

b

a

a

b

b

a