Compilers & Programming Languages

SOFE 3960U

Assignment #1

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Regular Languages

(1.1)

1.

$L_a = \{a\}$

$L_b = \{b\}$

Kleene Algebra = $L_a^3 L_a^* L_b$

2.

ASSUMPTION: Can have a list of only one integer

ASSUMPTION: The list does not end with a comma

$L_I = \{0,1\ldots,9\}$

$L_w = \{\ \}$

$L_c = \{,\}$

Kleene Algebra = $L_I^+ (L_w^* L_c L_w^* L_I)^*$

3.

$L = \{a,b\}$

Kleene Algebra = L^4

(1.2)

1.

Regular expression = ^a{3,}b*

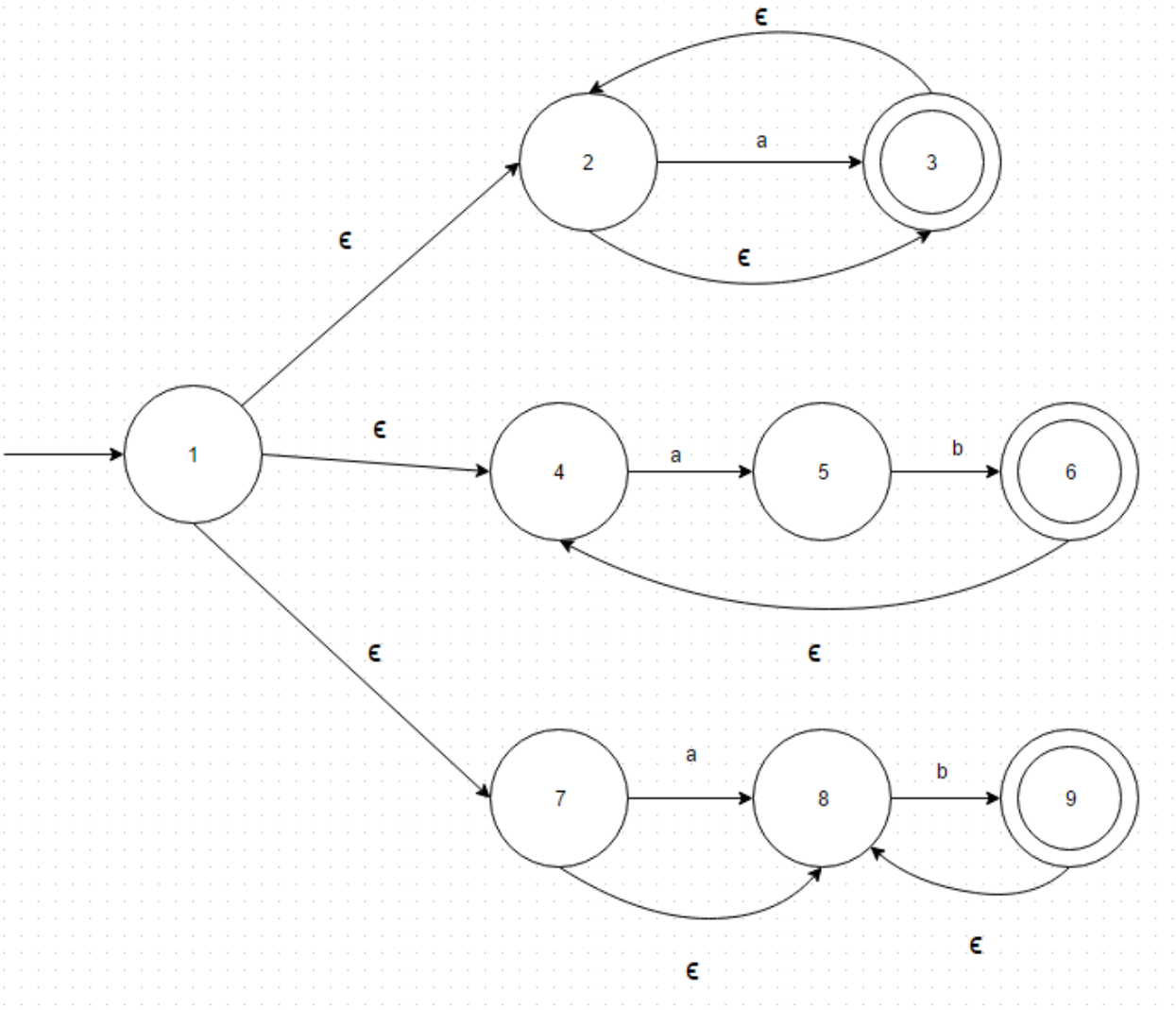
2.

Regular expression = [0-9]+(*, *[0-9]+)*

3.

Regular expression = [ab]{4}

1.3 NFA Diagram



1.4

A = {1,2,3,4,7,8}

Final State

a → {3,5,8} ϵ → {3,5,8,2} new state

b → {9} ϵ → {9,8} new state

B = {3,5,8,2}

Final State

a → {3} ϵ → {3,2} new state

b → {6,9} ϵ → {6,9,4,8} new state

C = {9,8}

Final State

a → {}

b → {9} ϵ → {9,8} old state

D = {3,2}

Final State

a → {3} ϵ → {3,2} old state

b → {}

E = {6,9,4,8}

Final State

a → {5} ϵ → {5} new state

b → {9} ϵ → {9,8} old state

F = {5}

Final State

a → {}

b → {6} ϵ → {6,4} new state

G = {6,4}

Final State

a → {5} ϵ → {5} old state

b → {}

DFA Diagram