

Exercise Assignment #8
Hannah Roach
CSC 376

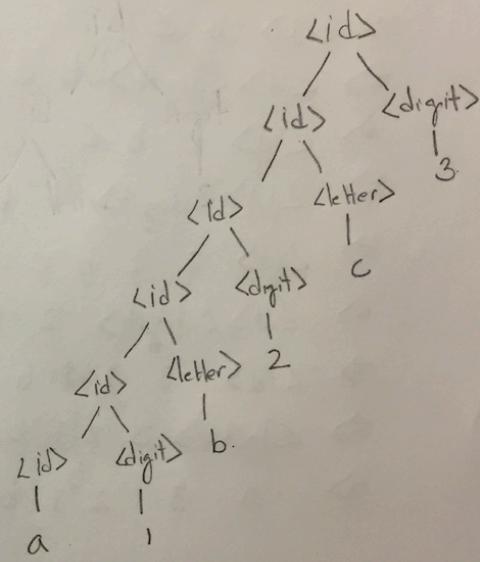
7.3

Derive the following string w/ the grammar of Fig 7.1 and draw the corresponding syntax tree.

b

a1b2c3

$\langle \text{id} \rangle \Rightarrow \langle \text{id} \rangle \langle \text{digit} \rangle$
 $\Rightarrow \langle \text{id} \rangle 3$
 $\Rightarrow \langle \text{id} \rangle \langle \text{letter} \rangle 3$
 $\Rightarrow \langle \text{id} \rangle C 3$
 $\Rightarrow \langle \text{id} \rangle \langle \text{digit} \rangle C 3$
 $\Rightarrow \langle \text{id} \rangle 2 C 3$
 $\Rightarrow \langle \text{id} \rangle \langle \text{letter} \rangle 2 C 3$
 $\Rightarrow \langle \text{id} \rangle b 2 C 3$
 $\Rightarrow \langle \text{id} \rangle \langle \text{digit} \rangle b 2 C 3$
 $\Rightarrow \langle \text{id} \rangle 1 b 2 C 3$
 $\Rightarrow a 1 b 2 C 3$



7.3

C

a 3 2 1 b c

$\langle \text{id} \rangle \Rightarrow \langle \text{id} \rangle \langle \text{letter} \rangle$

$\Rightarrow \langle \text{id} \rangle c$

$\Rightarrow \langle \text{id} \rangle \langle \text{letter} \rangle c.$

$\Rightarrow \langle \text{id} \rangle b c.$

$\Rightarrow \langle \text{id} \rangle \langle \text{digit} \rangle b c.$

$\Rightarrow \langle \text{id} \rangle 1 b c.$

$\Rightarrow \langle \text{id} \rangle \langle \text{digit} \rangle 1 b c.$

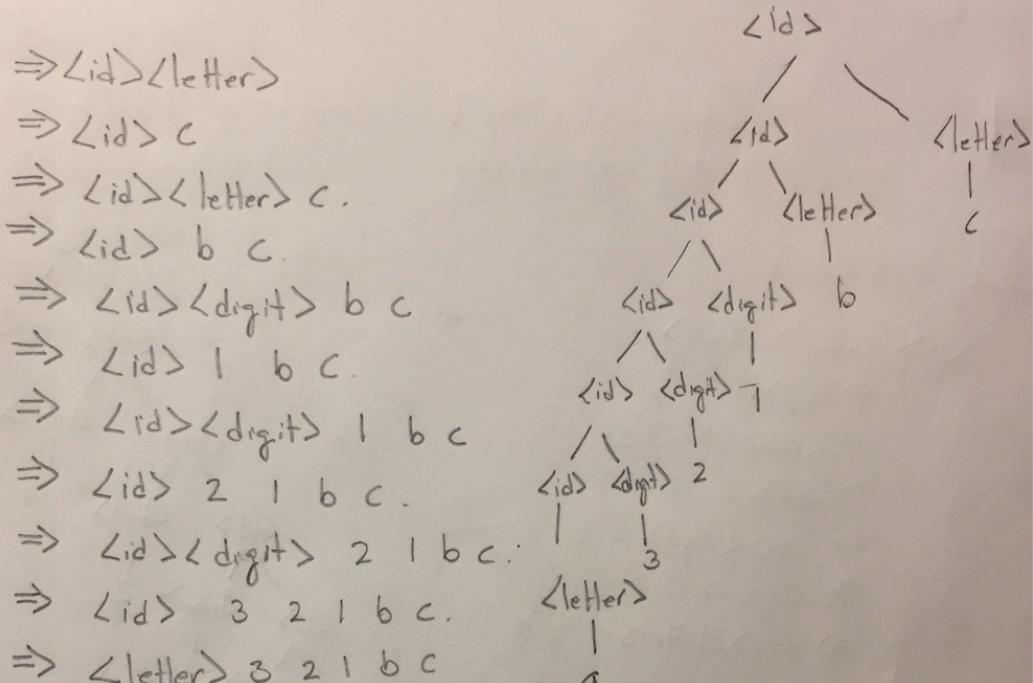
$\Rightarrow \langle \text{id} \rangle 2 1 b c.$

$\Rightarrow \langle \text{id} \rangle \langle \text{digit} \rangle 2 1 b c.$

$\Rightarrow \langle \text{id} \rangle 3 2 1 b c.$

$\Rightarrow \langle \text{letter} \rangle 3 2 1 b c$

$\Rightarrow a 3 2 1 b c.$



7.4

Derive the following strings w/ the grammar of Fig 7.2 - draw
The corresponding syntax tree.

b

+ddd.

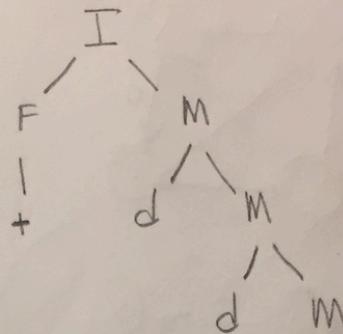
$$I \Rightarrow FM$$

$$\Rightarrow FdM$$

$$\Rightarrow FddM$$

$$\Rightarrow Fddd$$

$$\Rightarrow +ddd.$$

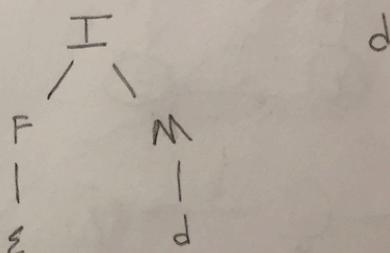


c

$$I \Rightarrow FM$$

$$\Rightarrow Fd$$

$$\Rightarrow \epsilon d$$

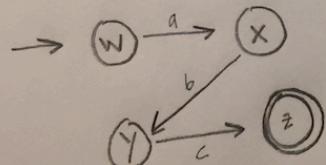


7.11

State if deterministic -

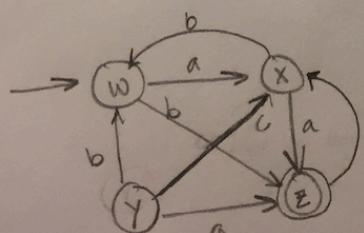
identify states that are inaccessible -

b



The machine is deterministic.
No inaccessible states.

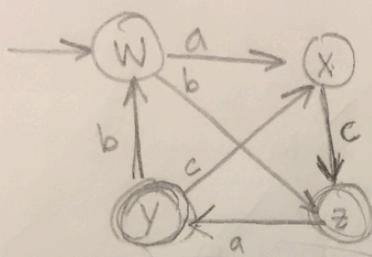
d



The machine is non deterministic.
Y is an inaccessible state.

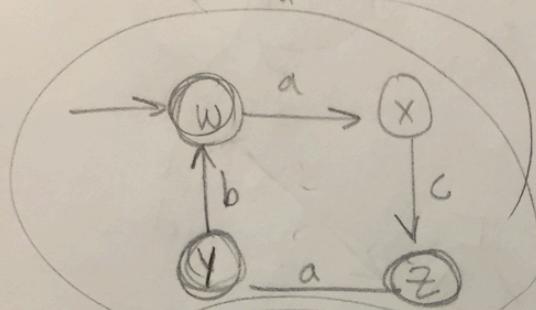
7.12 Remove the empty transitions to produce the equivalent machine for each of the finite state machines.

a.

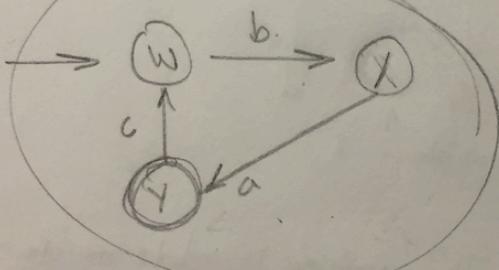


$$W \xrightarrow{a} X \xrightarrow{c} Z \xrightarrow{a} Y.$$

$$W \xrightarrow{b} Z \xrightarrow{c} Y \xrightarrow{a} W.$$

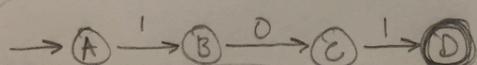


b.



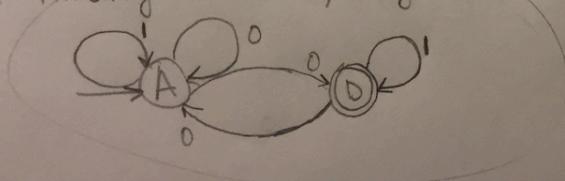
7.13

a.



b.

All strings of arbitrary length that end in 101.



7.13

d

