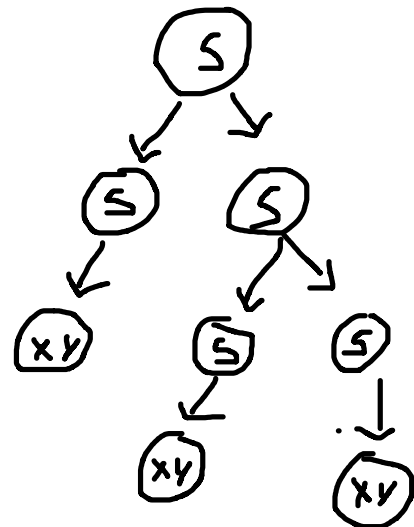
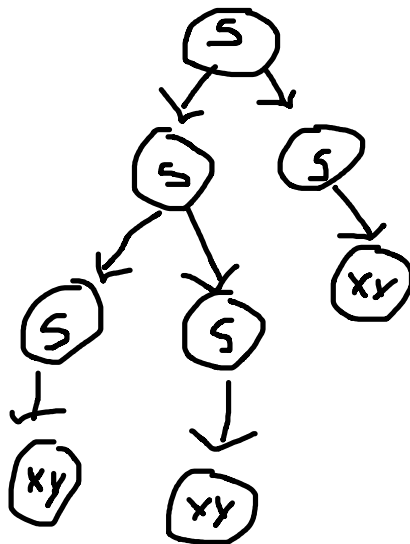


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 CSCE A331
 Programming Language Concepts
 Assignment 1

- A) Fifty fearless firefighters found foliage for friendly florists.
- B) C++ type checking is static, meaning types are checked before runtime.
- C) 1, 3, 5
- D) This language contains strings with either zero or multiples of 2 x's followed by either zero or multiples of 2 y's.
- E) 3, 4, 5, 7
- F) $a(a|b)^*$
- G)

- a. Leftmost
 - i. $S \rightarrow SS, (SS)$
 - ii. $S \rightarrow A, (AS)$
 - iii. $A \rightarrow xy, (xyS)$
 - iv. $S \rightarrow A, (xyA)$
 - v. $A \rightarrow xy, (xyxy)$
- b. Rightmost
 - i. $S \rightarrow SS, (SS)$
 - ii. $S \rightarrow A, (SA)$
 - iii. $A \rightarrow xy, (Sxy)$
 - iv. $S \rightarrow A, (Axy)$
 - v. $A \rightarrow xy, (xyxy)$
- c. $xyxyxy$



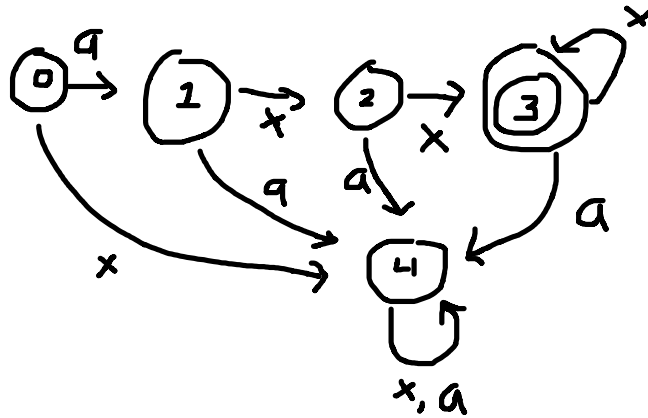
- d. Non-ambiguous
 - i. $S \rightarrow xyS$

ii. $S \rightarrow \epsilon$

H)

a. $axx(x)^*$

b. DFA



c.

i. $\langle a \rangle ::= "a"$

ii. $\langle x \rangle ::= "x"$

iii. $\langle \text{words} \rangle ::= \langle a \rangle \langle x \rangle \langle x \rangle \{ \langle x \rangle \}$

d. Yes, it doesn't dictate in which order the 0 or more x 's at the end of the words are expanded out.