CS6353 Homework Assignment 3

JXS200093

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I FIRST and FOLLOW

S → Aa
A → BD
B → b | ε
D → d | ε

	FIRST	FOLLOW
S	{b, ε}	{$}
A	{b, ε}	{a}
B	{b, ε}	{d, a}
D	{d, ε}	{a}

II LL Parsing

Stack	Input	Action
E$	a+a*a$	E → TA
TA$	a+a*a$	T → FB
FBA$	a+a*a$	F → a
aBA$	a+a*a$	terminal
BA$	+a*a$	B → ε
A$	+a*a$	A → +TA
+TA$	+a*a$	terminal
TA$	a*a$	T → FB
FBA$	a*a$	F → a
aBA$	a*a$	terminal
BA$	*a$	B → *FB
*FBA$	*a$	terminal
FBA$	a$	F → a
aBA$	a$	terminal
BA$	$	B → ε
A$	$	A → ε
$	$	ACCEPT

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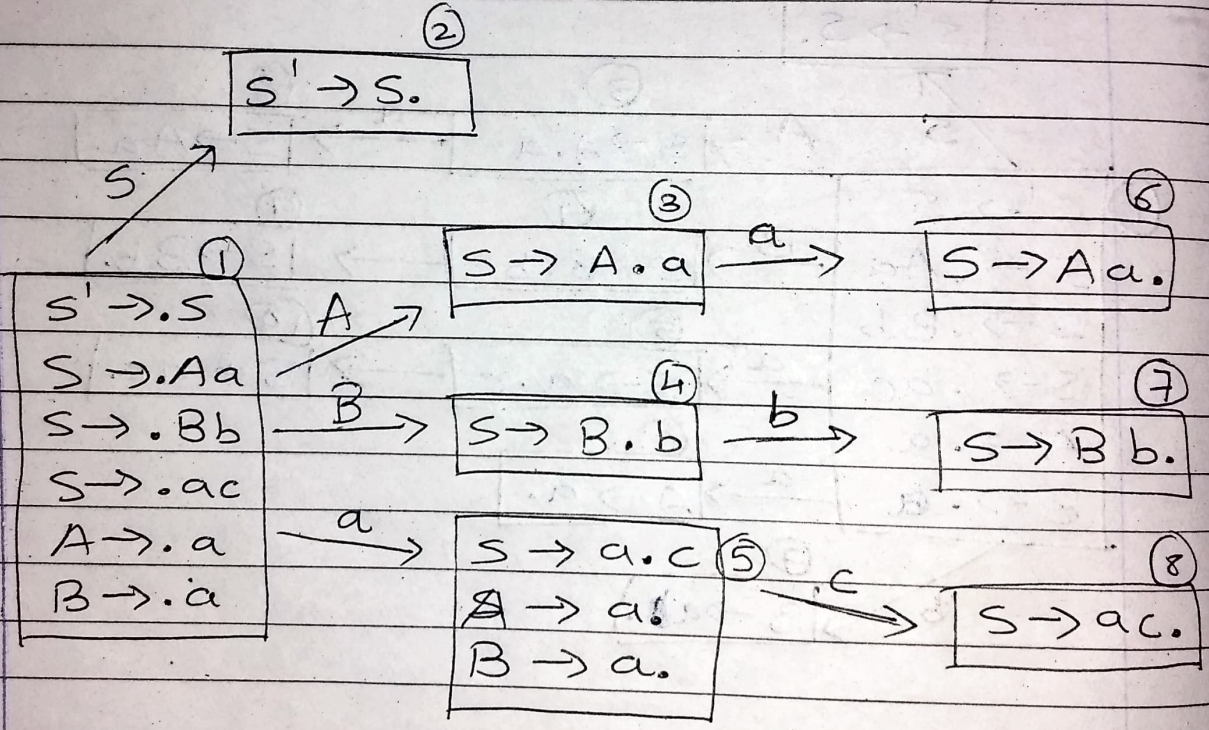
III LR Parsing

$S' \to S$
$S \to Aa$
$S \to Bb$
$S \to ac$
$A \to a$
$B \to a$



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IV Type System

1. if e1 has type int and e2 has type int then e1 * e2 has type int.

$$(e1 : int \wedge e2 : int) \Rightarrow e1 * e2 : int$$

$$\frac{\vdash e1 : int \qquad \vdash e2 : int}{\vdash e1 * e2 : int}$$

b.

$$\frac{\frac{[y \to t] \vdash y : int}{[x \to t] \vdash x : int}\ \text{Add}}{\frac{[x \to t; y \to t] \vdash x + t : int}{[x \to t] \vdash \lambda y : int \Rightarrow x + y : int \to int}\ \text{Def}}\ \text{Def}$$

$$[] \vdash \lambda x : int \Rightarrow (\lambda y : int \Rightarrow (x + y)) : int \to (int \to int)$$