

Implementation of LL(1) Parser N. Anyana API9110010340

CSE C

1.) $S \rightarrow aBa$

$B \rightarrow bB \mid \epsilon$

	a	b	\$
S	$S \rightarrow aBa$		
B	$B \rightarrow \epsilon$	$B \rightarrow bB$	

(i) $S \rightarrow aBa$

$FIRST(aBa) = \{a\}$

(ii) $B \rightarrow bB$

$FIRST(bB) = \{b\}$

(iii) $B \rightarrow \epsilon$

$FIRST(\epsilon) = \{\epsilon\}$

$FOLLOW(B) = \{a\}$

$\{(\epsilon, \$)\}$	$\{(\epsilon, \$)\}$	$\{(\epsilon, \$)\}$
$\{(b, \$)\}$	$\{(b, \$)\}$	$\{(b, \$)\}$
$\{(a, \$)\}$	$\{(a, \$)\}$	$\{(a, \$)\}$
$\{(b, a)\}$	$\{(b, a)\}$	$\{(b, a)\}$
$\{(a, a)\}$	$\{(a, a)\}$	$\{(a, a)\}$
$\{(b, +)\}$	$\{(b, +)\}$	$\{(b, +)\}$
$\{(a, +)\}$	$\{(a, +)\}$	$\{(a, +)\}$
$\{(b, \$)\}$	$\{(b, \$)\}$	$\{(b, \$)\}$
$\{(a, \$)\}$	$\{(a, \$)\}$	$\{(a, \$)\}$

$$2.) E \rightarrow TE'$$

$$E' \rightarrow +TE' \mid \epsilon$$

$$T \rightarrow FT'$$

$$T' \rightarrow *FT' \mid \epsilon$$

$$F \rightarrow (E) \mid d$$

E' is represented as A ,

T' is represented as B to facilitate the push operation in the program.

The grammar is changed to:

$$E \rightarrow TA$$

$$A \rightarrow +TA \mid \epsilon$$

$$T \rightarrow FB$$

$$B \rightarrow *FB \mid \epsilon$$

$$F \rightarrow (E) \mid d$$

	FIRST	FOLLOW
E	$\{ (, d \}$	$\{ \$,) \}$
A	$\{ +, \epsilon \}$	$\{ \$,) \}$
T	$\{ (, id \}$	$\{ +, \$,) \}$
B	$\{ *, \epsilon \}$	$\{ +, \$,) \}$
F	$\{ (, id \}$	$\{ *, +, \$,) \}$

$$(i) \text{ FIRST}(TA) = \{c, d\} [E \rightarrow TA]$$

$$(ii) \text{ FIRST}(+TA) = \{+\} [E \rightarrow +TA]$$

$$(iii) \text{ FIRST}(\epsilon) = \{\epsilon\} [A \rightarrow \epsilon]$$

$$\text{ FOLLOW}(A) = \{\$, \epsilon\}$$

$$(iv) \text{ FIRST}(FB) = \{c, d\} [T \rightarrow FB]$$

$$(v) \text{ FIRST}(*FB) = \{*\} [T \rightarrow *FB]$$

$$(vi) \text{ FIRST}(\epsilon) = \{\epsilon\} [B \rightarrow \epsilon]$$

$$\text{ FOLLOW}(B) = \{+, \$, \epsilon\}$$

$$(vii) \text{ FIRST}((E)) = \{(\} [F \rightarrow (E)]$$

$$(viii) \text{ FIRST}(d) = \{d\} [F \rightarrow d]$$

	d	+	*	()	\$
E	$E \rightarrow TA$			$E \rightarrow TA$		
A		$A \rightarrow +TA$			$A \rightarrow \epsilon$	$A \rightarrow \epsilon$
T	$T \rightarrow FB$			$T \rightarrow FB$		
B		$B \rightarrow \epsilon$	$B \rightarrow *FB$		$B \rightarrow \epsilon$	$B \rightarrow \epsilon$
F	$F \rightarrow d$			$F \rightarrow (E)$		