Compiler Design

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Syntax Analyser

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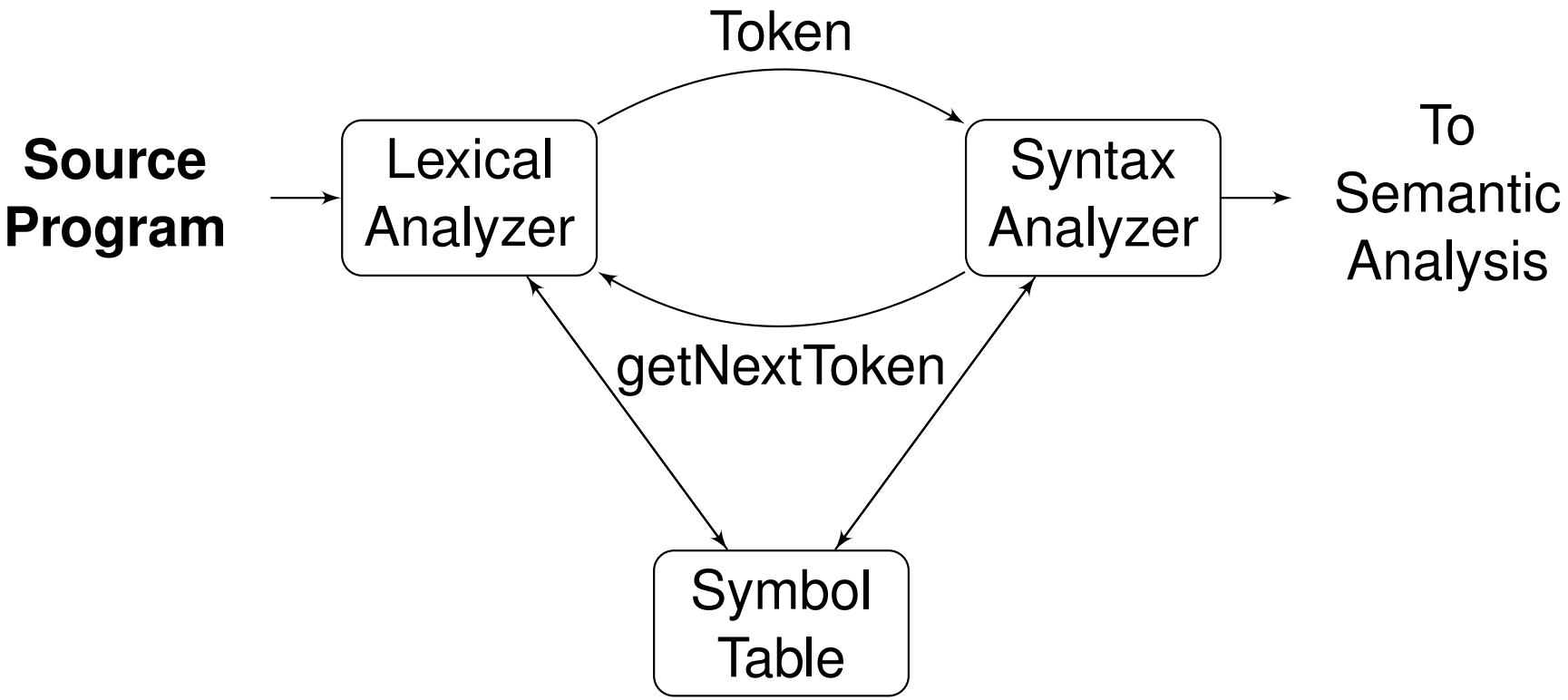
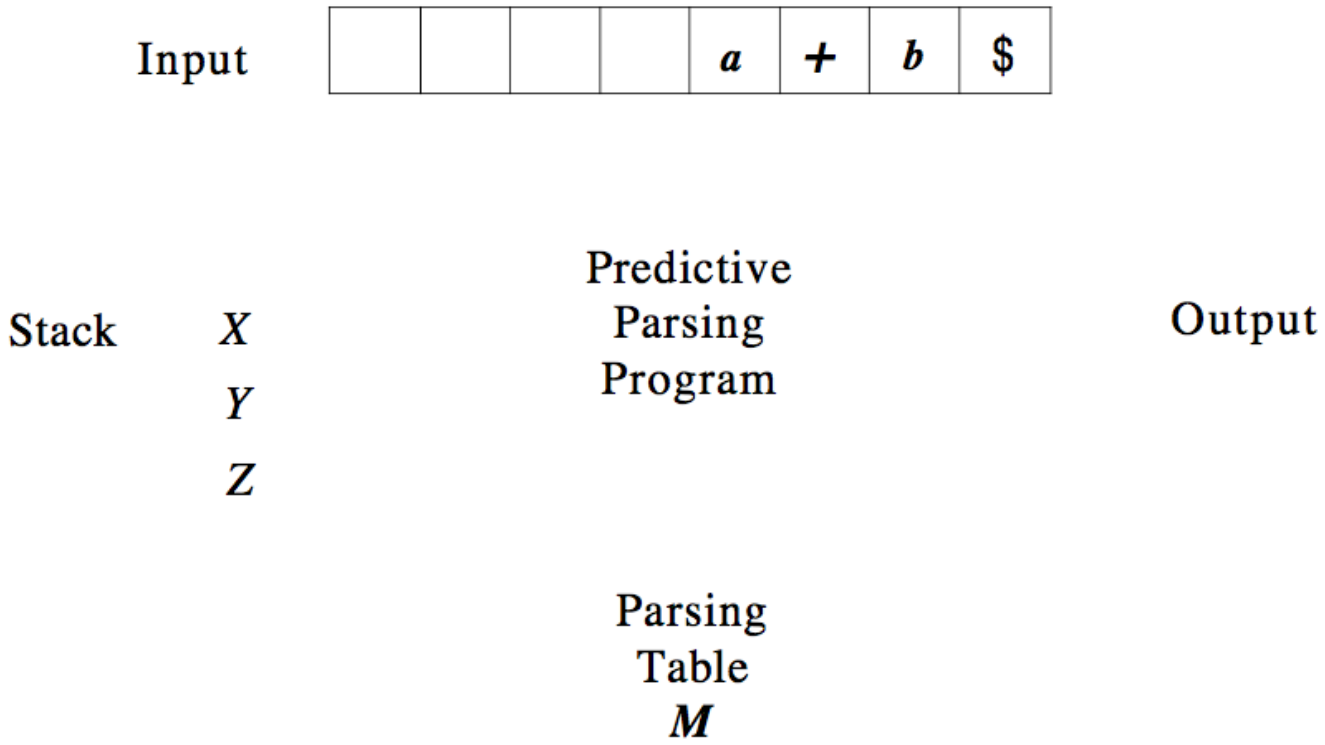


Model of a Table driven Nonrecursive Predictive Parser.



Consider the following Grammar

$E \rightarrow TE'$

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

$T \rightarrow FT$

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

$F \rightarrow (E)|id$

Construct the Predictive parsing table.

FIRST(E) = FIRST(T) = FIRST(F) = {(, id}
FIRST(E') ={ +, ϵ}
FIRST(T') ={*,ϵ}
FOLLOW(E) = FOLLOW(E') ={),$}
FOLLOW(T)=FOLLOW(T')={+,),$ }
FOLLOW(F) = {*, +,), $}

Table: Predictive Parsing Table

Non Terminal	*id*	+	*	(	)	$
E	$E \rightarrow TE'$			$E \rightarrow TE'$		
E'		$E' \rightarrow +TE'$			$E' \rightarrow \epsilon$	$E' \rightarrow \epsilon$
T	$T \rightarrow FT'$			$T' \rightarrow FT'$		
T'		$T' \rightarrow \epsilon$	$T' \rightarrow *FT'$		$T' \rightarrow \epsilon$	$T' \rightarrow \epsilon$
F	$F \rightarrow id$			$F \rightarrow (E)$		

Nonrecursive Predictive Parsing

1. If $X = a = \$$, the parser halts and announces successful completion of parsing.
2. If $X = a \neq \$$ the parser pops off the stack and advances the pointer to the next input symbol.
3. If X is a non terminal, the program consults $M[X, a]$ of parsing table M. The entry will be either an X-production of the grammar or an error entry.
   For example, If M[X,a] = $\{X \rightarrow UVW\}$, the parser replaces X on top of the stack by WVU (with U on top).

Table: Parsing: id+id*id

Stack	Input	Output
$E	id+id*id$	
$E'T	id+id*id$	$E \rightarrow TE'$
$E'T'F	id+id*id$	$T \rightarrow FT'$
$E'T'id	id + id * id $	$F \rightarrow id$
$E'T'	+id*id $	
$E'	+id*id$	$T' \rightarrow \epsilon$
⋮	⋮	⋮
$	$	Accept

Implement a predictive parser using C program.

LL(1) Grammar:

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A grammar whose parsing table has no any multiply defined entries is said to be LL(1). The first L in **L**L(1) stands for scanning the input from left to right, the second “L” for producing left most derivation and the “1” for using one input symbol of lookahead at each step to make parsing action decision.