

AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING
ICHEP – Junior Level – CESS
CSE439: Design of Compilers
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TINY LANGUAGE SCANNER AND PARSER

CASE#2

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Grammar Rules:

1. $\text{Exp} \rightarrow \text{Exp} \parallel \text{Term} \mid \text{Term}$
2. $\text{Term} \rightarrow \text{Term} \&\& \text{Factor} \mid \text{Factor}$
3. $\text{Factor} \rightarrow \text{Factor Comop Operand} \mid \text{Operand}$
4. $\text{Comop} \rightarrow > \mid = \mid <$
5. $\text{Operand} \rightarrow ! \text{Operand} \mid \text{identifier}$

Left Recursion Elimination:

$\text{exp} \rightarrow \text{term exp}'$
 $\text{exp}' \rightarrow \parallel \text{term exp}' \mid \epsilon$
 $\text{term} \rightarrow \text{factor term}'$
 $\text{term}' \rightarrow \&\& \text{factor term}' \mid \epsilon$
 $\text{factor} \rightarrow \text{operand factor}'$
 $\text{factor}' \rightarrow \text{comop operand factor}' \mid \epsilon$
 $\text{comop} \rightarrow > \mid = \mid <$
 $\text{operand} \rightarrow ! \text{operand} \mid \text{Identifier}$

First & Follow:

	First	Follow
exp	{ ! , Identifier }	{ \$ }
exp'	{ \parallel , ϵ }	{ \$ }
term	{ ! , Identifier }	{ \parallel , \$ }
term'	{ $\&\&$, ϵ }	{ \parallel , \$ }
factor	{ ! , Identifier }	{ $\&\&$, \parallel , \$ }
factor'	{ $>$, $=$, $<$, ϵ }	{ $\&\&$, \parallel , \$ }
comop	{ $>$, $=$, $<$ }	{ ! , Identifier }
operand	{ ! , Identifier }	{ $>$, $=$, $<$, $\&\&$, \parallel , \$ }

Parse Table:

	Identifier	>	=	<	&&		!	\$
exp	exp \rightarrow term exp'						exp \rightarrow term exp'	exp' $\rightarrow \epsilon$
exp'						exp' \rightarrow term exp'		
term	term \rightarrow factor term'						term \rightarrow factor term'	
term'					term' \rightarrow && factor term'	term' $\rightarrow \epsilon$		term' $\rightarrow \epsilon$
factor	factor \rightarrow operand factor'						factor \rightarrow operand factor'	
factor'		factor' \rightarrow comop operand factor'	factor' \rightarrow comop operand factor'	factor' \rightarrow comop operand factor'	factor' $\rightarrow \epsilon$	factor' $\rightarrow \epsilon$		factor' $\rightarrow \epsilon$
comop		comop \rightarrow >	comop \rightarrow =	comop \rightarrow <				
operand	operand \rightarrow ! operand						operand \rightarrow ! operand	