CS29003 ALGORITHMS LABORATORY
ASSIGNMENT 2
Date: 25 – July – 2019

Designing a Reverse-Polish Notation Calculator

Let's evaluate the expression 11%3*(10-3-2)/2

Exercise 1: Convert the given arithmetic expression into Reverse-Polish Notation - Working of the Operator Stack

Next Token	Operation on Stack	Stack	Reverse-Polish Expression
11			11
%	Push '%'	%	11
3			11 3
*	Pop		11 3 %
	Push '*'	*	11 3 %
(	Push '('	* (	11 3 %
10		* (	11 3 % 10
-	Push '-'	* (-	11 3 % 10
3		* (-	11 3 % 10 3
-	Pop	* (	11 3 % 10 3 -
	Push '-'	* (-	11 3 % 10 3 -
2		* (-	11 3 % 10 3 - 2
)	Pop	* (	11 3 % 10 3 - 2 -
	Pop	*	11 3 % 10 3 - 2 -
/	Pop		11 3 % 10 3 - 2 - *
	Push '/'	/	11 3 % 10 3 - 2 - *
2		/	11 3 % 10 3 - 2 - * 2
	Pop		11 3 % 10 3 - 2 - * 2 /

Table 1: Working of the Operator Stack - Rightmost token is the Stack Top

Therefore, the obtained expression in Reverse-Polish Notation is: **11 3 % 10 3 - 2 - * 2 /**

Let's calculate the value of the Reverse-Polish expression 11 3 % 10 3 - 2 - * 2 /

Exercise 2: Evaluate the obtained arithmetic expression in Reverse-Polish Notation - Working of the Operand Stack

Next Token	**Operation on Stack**	**Stack**
11	Push	11
3	Push	11 3
%	Pop	11
	Pop	
	Calculate and Push	2
10	Push	2 10
3	Push	2 10 3
-	Pop	2 10
	Pop	2
	Calculate and Push	2 7
2	Push	2 7 2
-	Pop	2 7
	Pop	2
	Calculate and Push	2 5
*	Pop	2
	Pop	
	Calculate and Push	10
2	Push	10 2
/	Pop	10
	Pop	
	Calculate and Push	5
	Pop	

Table 2: Working of the Operand Stack - Rightmost token is the Stack Top

Therefore, the value of the given arithmetic expression is **5**