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NATIONAL INSTITUTE OF TECHNOLOGY SILCHAR

ASSAM, CACHER, INDIA

LABORATORY WORK : DATA STRUCTURE

CS-211

B. TECH. III rd SEM

COMPUTER SCIENCE AND ENGINEERING

NAME : Subhojit Ghimire

SCH. ID. : 1912160

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* EVALUATION OF infix and postfix expressions

Q. Convert the given infix notation to an equivalent postfix notation of expression using stack table:

((A+B) * C) -(D / E))

→

Step	Input	Action	Stack	(Expression) Output.
1.	(	PUSH	(	
2.	(	PUSH	((	
3.	(	PUSH	(((	
4.	A	PRINT	(((	A
5.	+	PUSH	(((+	A
6.	B	PRINT	(((+	AB
7.	)	POP	((	AB+
8.	*	PUSH	((*	AB+
9.	C	PRINT	((*	AB+C
10.	)	POP	(	AB+C*
11.	-	PUSH	(-	AB+C*
12.	(	PUSH	(-(	AB+C*
13.	D	PRINT	(-(	AB+C*D
14.	/	PUSH	(-(/	AB+C*D
15.	E	PRINT	(-(/	AB+C*DE
16.	)	POP	(-	AB+C*DE/
17.	)	POP	EMPTY	AB+C*DE/-

∴ Postfix for (A+B) * C - D/E is AB+C*DE/-

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Q. Convert the given postfix expression to infix notation.

AB+C*DE/-

→

Step	Input	Action	Stack	Expression Output
1.	A	PUSH	A	
2.	B	PUSH	A,B	
3.	+	POP		(A+B)
4.	●	PUSH	(A+B)	
5.	C	PUSH	(A+B), C	
6.	*	POP		((A+B)*C)
7.		PUSH	((A+B)*C)	
8.	D	PUSH	((A+B)*C)), D	
9.	E	PUSH	((A+B)*C)), D, E	
10.	/	POP	((A+B)*C))	D/E
11.		PUSH	((A+B)*C)), (D/E)	
12.	-	POP	EMPTY	(((A+B)*C))-(D/E))

∴ Infix for AB+C*DE/- is (((A+B)*C))-(D/E))

= (A+B)*C-D/E

Q. EVALUATE USING STACK TABLE (SIMPLE STACK TABLE)

12, 7, 3, -, /, 2, 1, 5, +, *, +

→

INPUT	STACK
12	12
7	12,7
3	12,7,3
-	12,4
/	3
2	3,2
1	3,2,1
5	3,2,1,5
+	3,2,6
*	3,12
+	15

∴ Answer = 15

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Q. EVALUATE USING STACK TABLE (Complex)

12, 7, 3, -, 1, 2, 1, 5, +, *, +

→

Steps	Input	Action	Stack	Output (Evaluations)
1.	12	PUSH	12	
2.	7	PUSH	12,7	
3.	3	PUSH	12,7,3	
4.	-	POP	12	7-3=4
5.		PUSH	12,4	
6.	/	POP		12/4=3
7.		PUSH	3	
8.	2	PUSH	3,2	
9.	1	PUSH	3,2,1	
10.	5	PUSH	3,2,1,5	
11.	+	POP	3,2	1+5=6
12.		PUSH	3,2,6	
13.	*	POP	3,	2*6=12
14.		PUSH	3,12	
15	+	POP	EMPTY	3+12=15

∴ Answer = 15

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Q. Evaluate Using Stack Table:

TRUE, FALSE, NOT, AND, TRUE, TRUE, AND, OR

→

Steps	Input	Action	Stack	~~(output)~~ Evaluation
1.	TRUE	PUSH	TRUE	
2.	FALSE	PUSH	TRUE, FALSE	
3.	NOT	POP	TRUE	NOT FALSE = TRU
4.		PUSH	TRUE, TRUE	
5.	AND	POP		T AND T = T
6.		PUSH	TRUE	
7.	TRUE	PUSH	TRUE, TRUE	
8.	TRUE	PUSH	T, T, T	
9.	AND	POP	TRUE	T AND T = T
10.		PUSH	TRUE, TRUE	
11.	OR	POP	EMPTY.	T OR T = T

∴ Final Output = TRUE