Mihir sahu

1nt21is093

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Algorithm to evaluate the postfix expression

1. Create a stack to store operands.

2. Scan the given expression from left to right.

3. a) If the scanned character is an operand, push it into the stack.

b) If the scanned character is an operator, POP 2 operands from stack and perform operation and PUSH the result back to the stack.

4. Repeat step 3 till all the characters are scanned.

5. When the expression is ended, the number in the stack is the final result.

Code:

#include<stdio.h>

  int stack[20];                        //   for max size of stack

int top = -1 ;                          // declare stack and its top pointer to be used during postfix

void push(int x)                    // define push operation

{

    stack[++top] = x;

}

int pop()                          // define pop operation

{

    return stack[top--];

}

int main()                           // call main function

{

    char exp[20];

    char \*e;

    int n1,n2,n3,num;

    printf("Enter the expression :: ");

    scanf("%s",exp);

    e = exp;

    while(\*e != '\0')                      // using while loop

    {

        if(isdigit(\*e))

        {

            num = \*e - 48;

            push(num);

        }

        else

        {

            n1 = pop();

            n2 = pop();

            switch(\*e)                                 // using switch statement

            {

            case '+':

            {

                n3 = n1 + n2;

                break;

            }

            case '-':

            {

                n3 = n2 - n1;

                break;

            }

            case '\*':

            {

                n3 = n1 \* n2;

                break;

            }

            case '/':

            {

                n3 = n2 / n1;

                break;

            }

            }

            push(n3);

        }

        e++;

    }

    printf("\nThe result of expression %s  =  %d\n\n",exp,pop());

    return 0;

}

O/P:

