Prompt

Postfix notation is an unambiguous way of writing an arithmetic expression without parentheses. It is defined so that if "(exp_1)**op**(exp_2)" is a normal, fully parenthesized expression whose operation is **op**, the postfix version of this is "$pexp_1\, pexp_2$**op**", where $pexp_1$ is the postfix version of exp_1 and $pexp_2$ is the postfix version of exp_2. The postfix version of a single number or variable is just that number or variable. For example, the postfix version of "$((5 + 2) * (8 - 3))/4$" is "5 2 + 8 3 − ∗ 4 /". Describe a nonrecursive way of evaluating an expression in postfix notation.

Discussion

See the solution for Exercise 6.34.

Algorithm 1: EvaluatePostfix(P, S)

Input **:** Postfix expression P, Stack S
***Output*:** The evaluated value of P

for *each token t in P* **do**
    if *t is a value* **then**
        Push t onto S;
    else if *t is an operator* **then**
        $operand2 \leftarrow S.pop()$;
        $operand1 \leftarrow S.pop()$;
        $value \leftarrow (operand1\ t\ operand2)$;
        $S.push(value)$;
    end
end

return S.pop()