

COL-216 Assignment-2

Mohit Thakur 2019CS10373
Sidharth Agarwal 2019CS50661

February 28, 2021

Aim

Write a MIPS Assembly Program for evaluating an expression in postfix format.

Approach

1. We realized that the stack will be the most handy data structure to evaluate the postfix expressions.
2. We took the input with one character at a time and if it is integer, we added it to stack. If an operator, we operate it on the top 2 elements(if available). If an newline character then terminate the program with suitable output.

Design Decisions

Error handling : We raised error for the cases:

1. Input character is neither a digit nor an operand.
2. If input is operator and stack has less than 2 elements.
3. If the character is newline and the stack has more than one element than or no element.

Testing

We tested the compiled code by manually typing inputs in the console window. We checked if it is calculating correctly for some testcases also checked if it raises the appropriate errors. We tried following inputs:

1. input: "325*+" Output: 13
2. input: "012*3*+45*+6-7+89*-" Output: -45
3. input: "0123456789+++++++" Output: 45
4. input: "3" Output: 3
5. input: "32+=" Output: "Invalid character"
6. input: "" Output: "Unbalanced postfix expression"
7. input: "3+5" Output: "Unbalanced postfix expression"
8. input: "3x+" Output: "Invalid character"