PROGRAMMING FOUNDATIONS 2

Title: Homework 6

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Things Observed:

* Reading user input.
* String manipulation
* Expression handling
* Handling user input
* Error handling

Things Learned:

* Creating a symbol table
* Converting prefix, infix and postfix notation
* Manipulating the stack
* Program design
* Receiving user input
* Enumerating states

Things Understood:

* Memory management
* Data structure manipulation
* String manipulation
* Data representation
* Data structure traversal
* Syntax checking

Test Case 1:

=== expression evaluation program starts ===

input: 2+3;

action: =

2+3 = 5

action: >

prefix of 2+3 is: + 2 3

action: <

postfix of 2+3 is: 2 3 +

action: c

input: (2+3)\*4;2+3\*4;

action: =

(2+3)\*4 = 20

2+3\*4 = 14

2+3 = 5

action: >

prefix of (2+3)\*4 is: \* + 2 3 4

prefix of 2+3\*4 is: + 2 \* 3 4

prefix of 2+3 is: + 2 3

action: <

postfix of (2+3)\*4 is: 2 3 + 4 \*

postfix of 2+3\*4 is: 2 3 4 \* +

postfix of 2+3 is: 2 3 +

action: s

input: a+b-c\*d/e;a=1;b=2;c=3;d=4;e=5;

action: =

cannot evaluate a=1 which is not an arithmetic expression, but assignment.

cannot evaluate b=2 which is not an arithmetic expression, but assignment.

cannot evaluate c=3 which is not an arithmetic expression, but assignment.

cannot evaluate d=4 which is not an arithmetic expression, but assignment.

cannot evaluate e=5 which is not an arithmetic expression, but assignment.

a+b-c\*d/e = 1

action: >

prefix of a+b-c\*d/e is: + a - b \* c / d e

no prefix of a=1 which is not an aritmetic expression, but assignment.

no prefix of b=2 which is not an aritmetic expression, but assignment.

no prefix of c=3 which is not an aritmetic expression, but assignment.

no prefix of d=4 which is not an aritmetic expression, but assignment.

no prefix of e=5 which is not an aritmetic expression, but assignment.

action: <

postfix of a+b-c\*d/e is: a b + c d \* e / -

no postfix of a=1 which is not an aritmetic expression, but assignment.

no postfix of b=2 which is not an aritmetic expression, but assignment.

no postfix of c=3 which is not an aritmetic expression, but assignment.

no postfix of d=4 which is not an aritmetic expression, but assignment.

no postfix of e=5 which is not an aritmetic expression, but assignment.

action: q

=== expression evaluation program ends ===

RUN SUCCESSFUL (total time: 8m 21s)

Test Case 2:

=== expression evaluation program starts ===

input: 5+6; 7+8 6\*9;5+;

action: =

5+6 = 11

cannot evaluate 7+8 6\*9 which is an invalid expression.

5+ no result, some variables have undefined value.

action: >

prefix of 5+6 is: + 5 6

no prefix of 7+8 6\*9 which is an invalid expression.

prefix of 5+ is: + 5

action: <

postfix of 5+6 is: 5 6 +

no postfix of 7+8 6\*9 which is an invalid expression.

postfix of 5+ is: 5 +

action: f

fully parenthesizing of 5+6 is: (5+6)

no fully parenthesizing of 7+8 6\*9 which is an invalid expression.

fully parenthesizing of 5+ is: (5+)

action: q

=== expression evaluation program ends ===

RUN SUCCESSFUL (total time: 59s)

Test case 3:

=== expression evaluation program starts ===

input: a+b+c;a=2;b=3;c=4;

action: =

cannot evaluate a=2 which is not an arithmetic expression, but assignment.

cannot evaluate b=3 which is not an arithmetic expression, but assignment.

cannot evaluate c=4 which is not an arithmetic expression, but assignment.

a+b+c = 9

action: c

input: d=45;

action: c

input: a+d;

action: =

cannot evaluate d=45 which is not an arithmetic expression, but assignment.

cannot evaluate a=2 which is not an arithmetic expression, but assignment.

cannot evaluate b=3 which is not an arithmetic expression, but assignment.

cannot evaluate c=4 which is not an arithmetic expression, but assignment.

a+d = 47

a+b+c = 9

action: c

input: 10\*5+4-5;

action: =

10\*5+4-5 = 49

cannot evaluate d=45 which is not an arithmetic expression, but assignment.

cannot evaluate a=2 which is not an arithmetic expression, but assignment.

cannot evaluate b=3 which is not an arithmetic expression, but assignment.

cannot evaluate c=4 which is not an arithmetic expression, but assignment.

a+d = 47

a+b+c = 9

action: >

prefix of 10\*5+4-5 is: + \* 10 5 - 4 5

prefix of a+d is: + a d

no prefix of d=45 which is not an aritmetic expression, but assignment.

prefix of a+b+c is: + a + b c

no prefix of a=2 which is not an aritmetic expression, but assignment.

no prefix of b=3 which is not an aritmetic expression, but assignment.

no prefix of c=4 which is not an aritmetic expression, but assignment.

action: <

postfix of 10\*5+4-5 is: 10 5 \* 4 + 5 -

postfix of a+d is: a d +

no postfix of d=45 which is not an aritmetic expression, but assignment.

postfix of a+b+c is: a b + c +

no postfix of a=2 which is not an aritmetic expression, but assignment.

no postfix of b=3 which is not an aritmetic expression, but assignment.

no postfix of c=4 which is not an aritmetic expression, but assignment.

action: q

=== expression evaluation program ends ===

RUN SUCCESSFUL (total time: 2m 9s)