

1. What Does This Program Do?

LEN (B\$) = 100
 LEN (MID\$(A\$,52,12)) = 12
 LEN (MID\$(B\$,26,13)) = 13
 LEN (C\$) = 12 + 13 = 25
 LEN (D\$) = 13
 LEN (E\$) = 100 + 25 + 13 = 138

1. 138

2. Prefix-Infix-Postfix

A (B + D) / (C - E) translates as follows:
 A * (B + D) / (C - E) = A * (B D +) / (C - E) =
 (A B D + *) / (C E -) = ABD + * C E - /

2. ABD + * C E - /

3. Prefix-Infix-Postfix

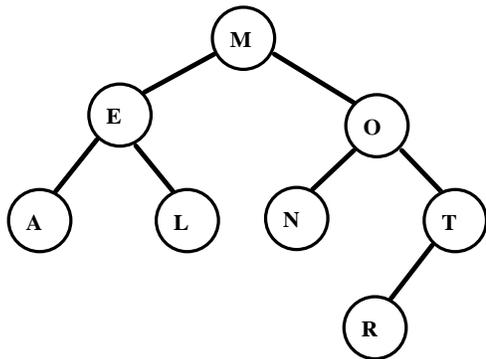
Converting + - + A * B C + A C C to infix gives:
 + - + A (B * C) (A + C) C = ((A + B C) - (A + C)) + C =
 (A + B C) - (A + C) + C . Substituting the given values gives:
 (2 + 4 * 8) - (2 + 8) + 8 = 34 - 10 + 8 = 32

3. 32

4. Data Structures

The tree is formed as shown and has an internal path length of 13.
 $13 = 2(1) + 4(2) + 3$

4. 13



5. Data Structures

A stack processes commands in LIFO order (Last In – First Out). The five items POPPED in order are B, C, A, F and E. The only item left in the stack is D.

5. D

6. Digital Electronics

The circuit translates to $A(B + \bar{B})$. This simplifies to A . The circuit is TRUE for (1, 0) and (1, 1). It is FALSE for (0, 1) and (0, 0).

6. D

7. Prefix/Postfix

The given expression converts to infix as follows:

$$A((A + B) / (C - (A / B)))$$

This converts to prefix as follows:

$$* A / + AB - C / AB$$

7. * A / + AB - C / AB

8. Prefix/Postfix

Converting the formula to infix produces the following:

$$V = 4 / 3 * \pi * R \uparrow 3$$

This converts to prefix as follows

$$= V * * / 4 3 \pi \uparrow R 3$$

8. = V * * / 4 3 \pi \uparrow R 3

9. Data Structures

The following is the result after each operation:

B, BI, BIN, IN, IND, ND, NDS, DS

The next item to be popped would be the D

9. D

10. Data Structures

Vulcan becomes the right child of VENUS. The values to be added are:

$$2+3+3+3+3+4+4+4+4 = 30$$

10. 30