1. Arithmetic Notation Using Stack
2. (A + B) \* (C / (D - E)) + F ^ G

Postfix

|  |  |  |
| --- | --- | --- |
| Symbol | Stack | Postfix String |
| ( | ( |  |
| A | ( | A |
| + | ( + | A |
| B | ( + | A B |
| ) |  | A B + |
| \* | \* | A B + |
| ( | \* ( | A B + |
| C | \* ( | A B + C |
| / | \* ( / | A B + C |
| ( | \* ( / ( | A B + C |
| D | \* ( / ( | A B + C D |
| - | \* ( / ( - | A B + C D |
| E | \* ( / ( - | A B + C D E |
| ) | \* ( / | A B + C D E - |
| ) | \* | A B + C D E - / |
| + | + | A B + C D E - / \* |
| F | + | A B + C D E - / \* F |
| ^ | + ^ | A B + C D E - / \* F |
| G | + ^ | A B + C D E - / \* F G |
|  |  | A B + C D E - / \* F G ^ + |

Prefix

|  |  |  |
| --- | --- | --- |
| Symbol | Stack | Prefix String |
| G |  | G |
| ^ | ^ | G |
| F | ^ | F G |
| + | + | ^ F G |
| ) | + ) | ^ F G |
| ) | + ) ) | ^ F G |
| E | + ) ) | E ^ F G |
| - | + ) ) - | E ^ F G |
| D | + ) ) - | D E ^ F G |
| ( | + ) | - D E ^ F G |
| / | + ) / | - D E ^ F G |
| C | + ) / | C - D E ^ F G |
| ( | + | / C – D E ^ F G |
| \* | + \* | / C – D E ^ F G |
| ) | + \* ) | / C – D E ^ F G |
| B |  | B / C – D E ^ F G |
| + | + \* ) + | B / C – D E ^ F G |
| A | + \* ) + | A B / C – D E ^ F G |
| ( | + \* | + A B / C – D E ^ F G |
|  |  | + \* + A B / C – D E ^ F G |

1. Evaluate

Prefix:

\* / \* 2 + 5 4 ^ 3 2 – 8 6

|  |  |
| --- | --- |
| Symbol | Stack |
| 6 | 6 |
| 8 | 6 8 |
| - | 2 |
| 2 | 2 2 |
| 3 | 2 2 3 |
| ^ | 2 9 |
| 4 | 2 9 4 |
| 5 | 2 9 4 5 |
| + | 2 9 9 |
| 2 | 2 9 9 2 |
| \* | 2 9 18 |
| / | 2 2 |
| \* | 4 |

Postfix:

3 7 + 5 / 2 3 ^ 1 3 + - +

|  |  |
| --- | --- |
| Symbol | Stack |
| 3 | 3 |
| 7 | 3 7 |
| + | 10 |
| 5 | 10 5 |
| / | 2 |
| 2 | 2 2 |
| 3 | 2 2 3 |
| ^ | 2 8 |
| 1 | 2 8 1 |
| 3 | 2 8 1 3 |
| + | 2 8 4 |
| - | 2 4 |
| + | 6 |

1. Hashing and Hash Table
2. Complete hashFunction using division method

A screen shot of a computer program

Description automatically generated

1. Insert using linear probing

Key of each data

* yve : 121 + 118 + 101 = 340 % 9 = 7
* pharsa : 112 + 104 + 97 + 114 + 115 + 97 = 639 % 9 = 0
* estes : 101 + 115 + 116 + 101 + 115 = 548 % 9 = 8
* miya : 109 + 105 + 121 + 97 = 432 % 9 = 0
* aulus : 97 + 117 + 108 + 117 + 115 = 554 % 9 = 5
* lylia : 108 + 121 + 108 + 105 + 97 = 539 % 9 = 8
* gusion : 103 + 117 + 115 + 105 + 111 + 110 = 661 % 9 = 4

|  |  |
| --- | --- |
| Index | Data |
| 0 | pharsa |
| 1 | miya |
| 2 | lylia |
| 3 |  |
| 4 | gusion |
| 5 | aulus |
| 6 |  |
| 7 | yve |
| 8 | estes |

1. Binary Search Tree
2. Complete code

A screen shot of a computer code

Description automatically generated

1. Simulate insertion: 26, 19, 75

26

start

A diagram of a network

Description automatically generated



26 < 53

A diagram of a network

Description automatically generated



26 < 33

A diagram of a network

Description automatically generated



26 < 33

A diagram of a network

Description automatically generated

19

start

A diagram of a network

Description automatically generated



19 < 53

A diagram of a network

Description automatically generated



19 < 21

A diagram of a network

Description automatically generated



19 > 10

A diagram of a network

Description automatically generated

75

start

A diagram of a network

Description automatically generated



75 > 53

A diagram of a network

Description automatically generated



75 < 79

A diagram of a network

Description automatically generated



75 > 62

A diagram of a network

Description automatically generated



75 > 68

A diagram of a network

Description automatically generated

Deletion: 33 and 79 using left most child of right subtree approach

33

start

A diagram of a diagram

Description automatically generated



33 < 53

A diagram of a diagram

Description automatically generated



33 > 21

33 Found

A diagram of a diagram

Description automatically generated



Find left most child of right subtree

A diagram of a diagram

Description automatically generated



Replace 33 with 48

A diagram of a diagram

Description automatically generated

79

start

A diagram of a diagram

Description automatically generated



79 > 53

79 Found

A diagram of a diagram

Description automatically generated



A diagram of a diagram

Description automatically generated