DATA STRUCTURES

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RESOURCES

- http://javatpoint.com/

OUTLINE

- Applications of Stacks
- Evaluation of Arithmetic Expressions

EVALUATION OF ARITHMETIC EXPRESSIONS

- A stack data structure can be used for evaluating arithmetic expressions.
- There are three standard notations for arithmetic expressions:
  - Infix Notation
  - Prefix Notation
  - Postfix Notation

TRANSFORMING INFIX INTO POSTFIX

- Create an empty stack to store operators.
- Create an empty string to store the output (postfix) expression.
- Scan the infix expression from left to right.
- If the current token is an operand (a number or variable), add it to the output string.
- If the current token is a left parenthesis, push it onto the operator stack.
- If the current token is a right parenthesis, pop operators from the stack and add them to the output string until a left parenthesis is encountered. Discard the left parenthesis.
- If the current token is an operator, pop operators from the stack and add them to the output string while they have equal or higher precedence than the current operator, and the stack is not empty. Then, push the current operator onto the stack.
- After scanning the entire infix expression, pop any remaining operators from the stack and add them to the output string.
- The resulting string is the postfix (also known as Reverse Polish notation) expression.

EXAMPLE

- Transform the following arithmetic operation into postfix notation:
- 2 + 3 * 4 - 2

SOLVING ARITHMETIC EXPRESSIONS

- Transform the infix arithmetic expression into postfix notation.
- Read expression from left to right until the end of the expression.
  - If token is an operand push it into the stack.
  - If the token is an operator
    - Pop the second operand
    - Pop the first operand
    - Evaluate the operator using the two poped operands.
    - Push the result into the stack.

ASSIGNMENT

- Implement infix to postfix expression transformation.
- Implement postfix expression evaluation.

THANK YOU

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