Data Structures And Algorithms

PSO - 1

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Topics

- Stack Implementation
  - Array
  - Linked List
- Reverse Polish Notation
- RPN Calculator
- Function Plotter
Topics

- **Stack Implementation**
  - Array
  - Linked List
- Reverse Polish Notation
- RPN Calculator
- Function Plotter
Array Implementation

- Arrays [MAX_SIZE]
- Top Pointer
List Implementation

- Arbitrary size
- Slightly complex
Topics

• Stack Implementation
  ▪ Array
  ▪ Linked List
• Reverse Polish Notation
• RPN Calculator
• Function Plotter
Reverse Polish Notation

- Invented by Jan Łukasiewicz (1920's)
- Operators follow all of their operands
- Postfix notation
- Unambiguous
Infix Notation

• To avoid ambiguity
  ▪ Precedence rules
  ▪ Rules for association
  ▪ Parentheses

• Fully parenthesized expressions do not require
  ▪ Precedence rules
  ▪ Rules for association
RPN Notation

- Don't need
  - Precedence rules
  - Parentheses

- Example
  - "(5 + ((1 + 2) * 4) − 3)" is equivalent to
    "5 1 2 + 4 * + 3 -"
Topics

- Stack Implementation
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RPN Calculator

START

KEY IN NEXT NUMBER

CAN YOU PERFORM ANY ONE NUMBER OPERATION?

DO IT

ENTER

CAN YOU PERFORM ANY TWO NUMBER OPERATION?

YES

DO IT

NO
Example: $5 \ 1 \ 2 + 4 * + 3 -$
Topics

- Stack Implementation
  - Array
  - Linked List
- Reverse Polish Notation
- RPN Expression Evaluation
- RPN Calculator
- Function Plotter
Questions