

Stack Java Class and Test Documentation

Software Name

Java Stack Implementation

Purpose

This software provides a simple **stack data structure** implementation in Java, following the **Last In, First Out (LIFO)** principle. It includes the Stack class to perform standard stack operations (push, pop, top, size) and a StackTest class for unit testing these operations using JUnit.

Install

To use or test this stack implementation:

1. **Java Development Kit (JDK)**: Ensure you have JDK 8 or above installed.
2. **JUnit 5**: Ensure JUnit 5 is available in your project dependencies (via Maven, Gradle, or manually).

Usage

Stack Class

The Stack class includes the following methods for stack operations:

- **Constructor:**
 - Stack(int size): Initializes a stack with the specified maximum size.
- **Methods:**
 - boolean isEmpty(): Returns true if the stack is empty, otherwise false.
 - int pop(): Removes and returns the top element of the stack, or -1 if the stack is empty.
 - void push(int element): Adds an element to the stack. Throws StackOverflowError if the stack is full and IllegalArgumentException if element is negative.
 - int top(): Returns the top element without removing it, or -1 if the stack is empty.
 - int size(): Returns the current number of elements in the stack.

StackTest Class

The StackTest class contains unit tests for the Stack class methods, ensuring that stack operations perform as expected. The tests cover scenarios for both normal and edge cases.

Contributing

To contribute:

1. Fork the repository.
2. Create a new branch for your feature or bug fix.
3. Commit your changes with descriptive messages.
4. Create a pull request, detailing the modifications you made.

Please ensure that all contributions maintain code readability and consistency.

Citation Hint

If you use this stack implementation in academic or educational projects, please include a citation to acknowledge its use.

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