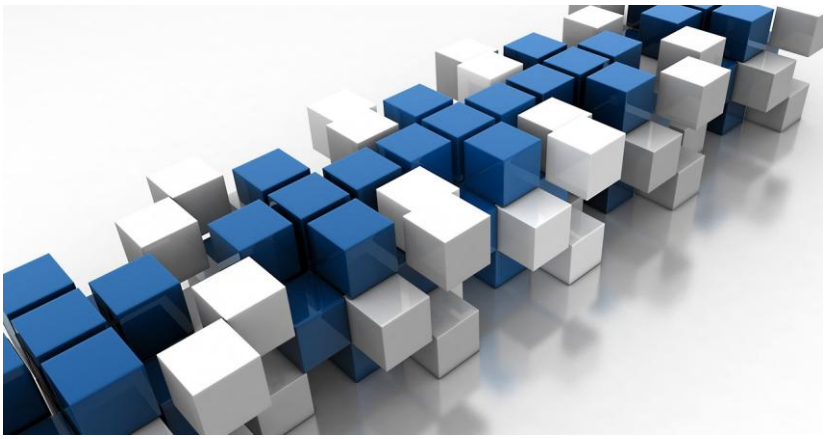

STACKS, QUEUES AND DEQUES

DATA STRUCTURES IN JAVA

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Contents

Stacks

A stack is a collection of elements that supports two primary operations: push and pop. The push operation adds an element to the top of the stack, while the pop operation removes the top element from the stack.

One of the key characteristics of a stack is that it follows a Last-In, First-Out (LIFO) ordering. This means that the most recently added element is always the first one to be removed. To visualize this, you can think of a stack as a pile of books or plates, where you can only add or remove items from the top of the pile.

Stacks are widely used in computer science and software engineering. They are used in programming languages to implement function calls, in web browsers to store the history of visited pages, and in operating systems to store information about processes and their state.

Queues

A queue is a collection of elements that supports two primary operations: enqueue and dequeue. The enqueue operation adds an element to the back of the queue, while the dequeue operation removes the element from the front of the queue.

One of the key characteristics of a queue is that it follows a First-In, First-Out (FIFO) ordering. This means that the first element added to the queue is always the first one to be removed. To visualize this, you can think of a queue as a line of people waiting for a bus or a rollercoaster, where the person who arrived first is the first one to board.

Queues are widely used in computer science and software engineering. They are used in operating systems to manage processes and their priority levels, in networking to handle packet traffic, and in video and audio streaming to buffer data.

Deques

A deque, short for double-ended queue, is a data structure that supports insertion and deletion of elements from both ends of the queue. This means that you can add elements to the front or the back of the deque and remove elements from the front or the back as well.