

Stacks

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Outline

- ▶ What are stacks?
- ▶ How can we implement them in Java?

Stacks

- ▶ Stacks are a useful data structure for storing a *collection* of elements.
- ▶ They are like a *pile* of plates or books or papers.
- ▶ We add new elements to the top; and when we remove elements, we also take them from the top
- ▶ This is referred to as *FIFO* – which stands for “first in, last out”.

Implementing stacks

- ▶ To implement a stack, we can use any collection that stores data in order, such as an array or a linked list.
- ▶ We will come back to linked lists later.
- ▶ We also need methods to *add* and *remove* items from the stack.
 - ▶ These operations are called *push* (for adding) and *pop* (for removing).

Stacks in Java

- ▶ We will look at a code example.
- ▶ We define
 - ▶ a *class*;
 - ▶ variables to hold data
 - ▶ methods, which implement *operations*

Limitations of the sample code

- ▶ One limitations of this code is that the stack has a fixed maximum capacity.
- ▶ Later we will explore some ways to fix this problem.