

21 Custom Generic Data Structures

Objectives

In this chapter you'll:

- Form linked data structures using references, self-referential classes, recursion and generics.
- Create and manipulate dynamic data structures, such as linked lists, queues, stacks and binary trees.
- Learn various important applications of linked data structures.
- Create reusable data structures with composition.
- Organize classes in packages to promote reuse.

Outline

1. 21.1 Introduction
2. 21.2 Self-Referential Classes
3. 21.3 Dynamic Memory Allocation
4. 21.4 Linked Lists
 1. 21.4.1 Singly Linked Lists
 2. 21.4.2 Implementing a Generic List Class

3. 21.4.3 Generic Classes `ListNode` and `List`
 4. 21.4.4 Class `ListTest`
 5. 21.4.5 `List` Method `insertAtFront`
 6. 21.4.6 `List` Method `insertAtBack`
 7. 21.4.7 `List` Method `removeFromFront`
 8. 21.4.8 `List` Method `removeFromBack`
 9. 21.4.9 `List` Method `print`
 10. 21.4.10 Creating Your Own Packages
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5. 21.5 Stacks
 6. 21.6 Queues
 7. 21.7 Trees
 8. 21.8 Wrap-Up
 1. Summary
 2. Self-Review Exercises
 3. Answers to Self-Review Exercises
 4. Exercises
 5. Special Section: Building Your Own Compiler