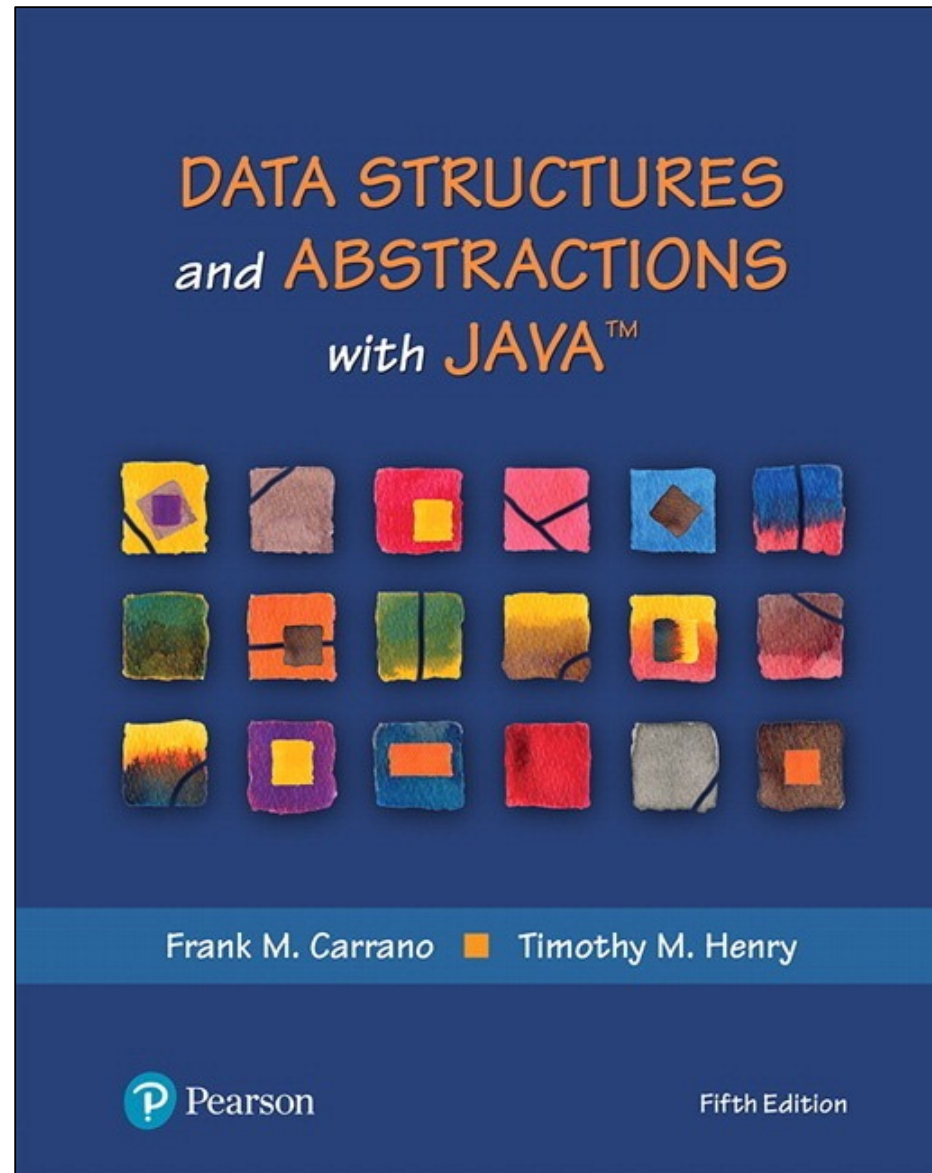
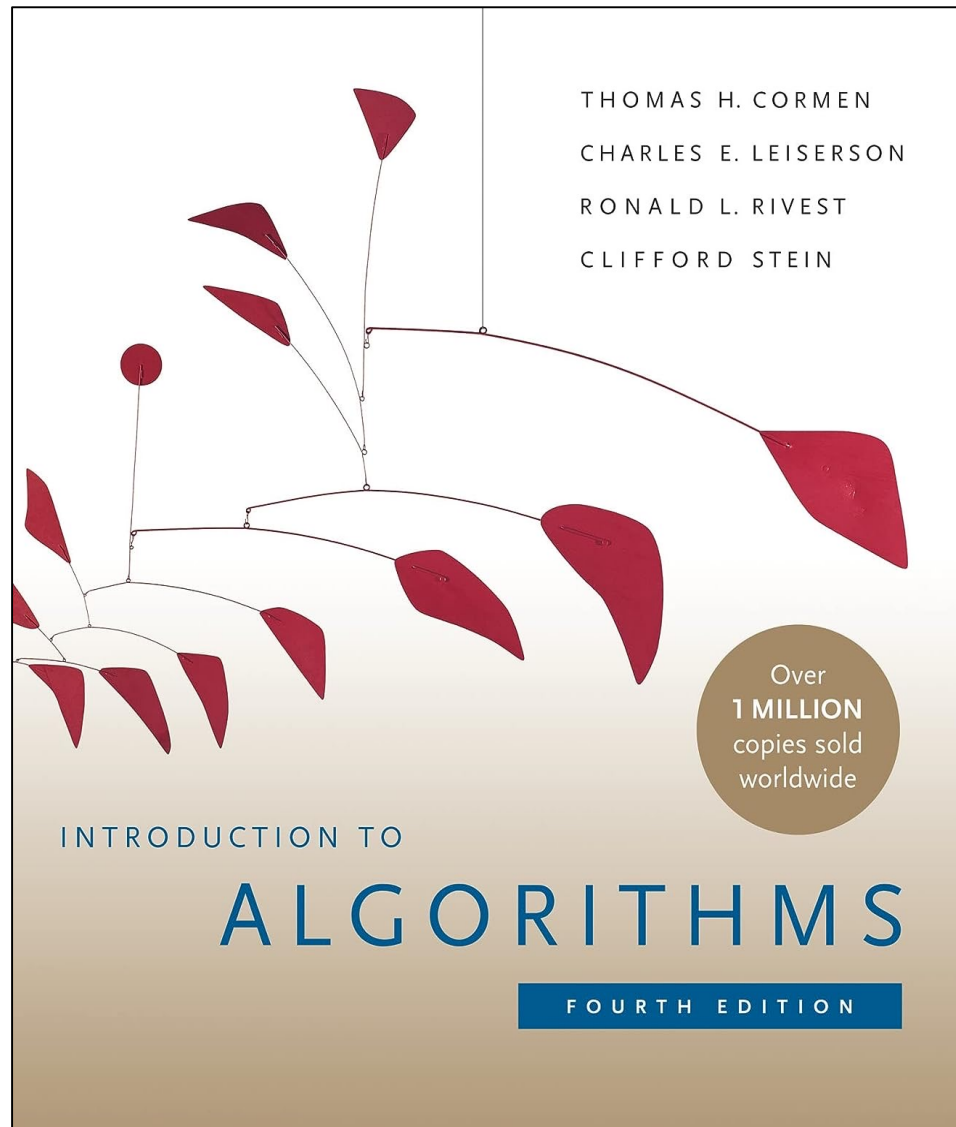


Textbook



Supplementary Materials





Northeastern
University

Lecture 1: Introduction and Java Review - 1

Prof. Chen-Hsiang (Jones) Yu, Ph.D.
College of Engineering

Materials are edited by Prof. Jones Yu from

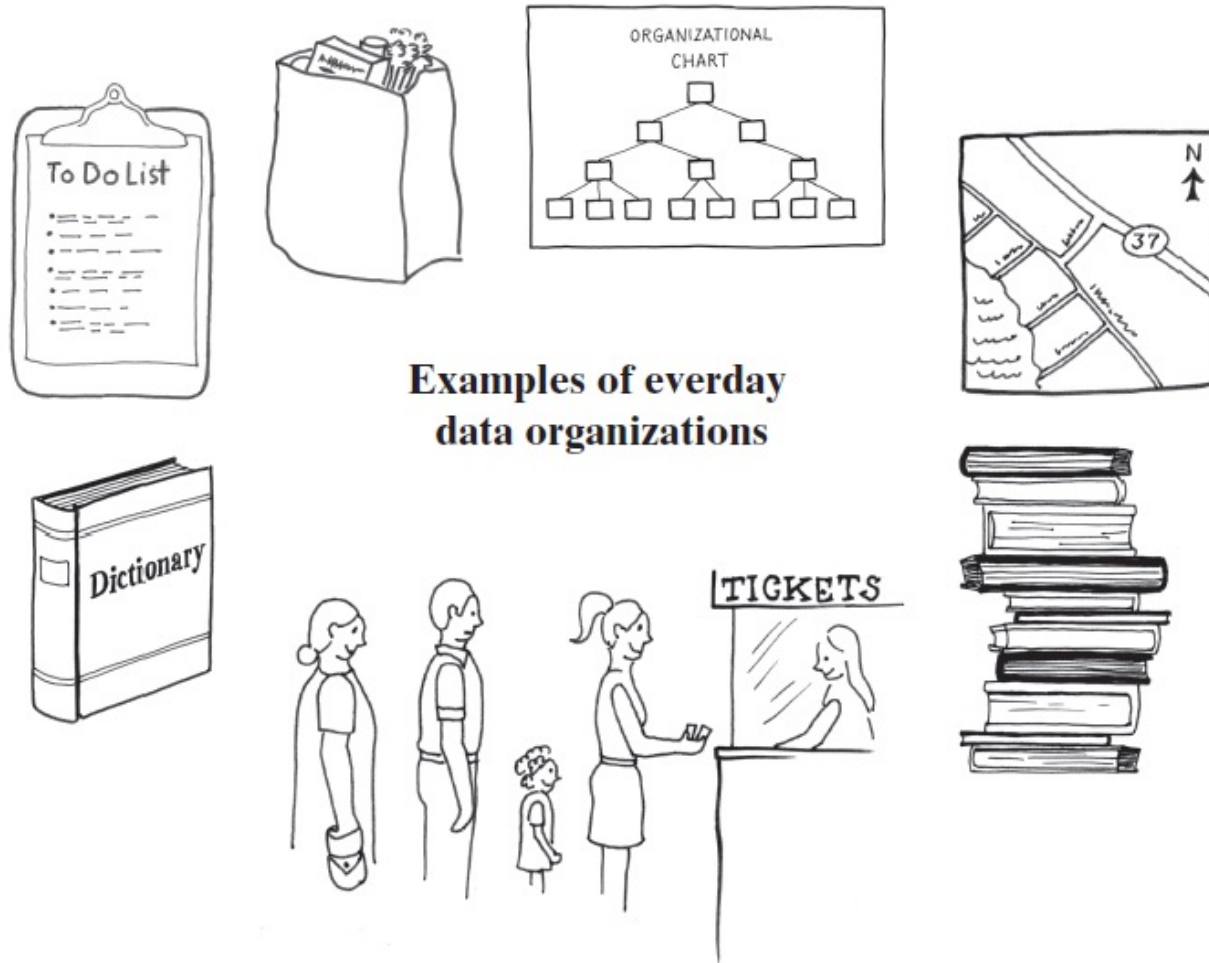
Data Structures and Abstractions with Java, 5th edition. By Frank M. Carrano and Timothy M. Henry.
ISBN-13 978-0-13-483169-5 © 2019 Pearson Education, Inc.

Outline

- Introduction
- Java Review - 1

Introduction

Data Organization



Data Organization in Life

- Standing in a line
- Stack of books
- To-Do list
- Dictionary
- Folders, directories on your computer
- Road map

Computer Data Organization

- Abstract Data Type (ADT)
 - » A specification that describes a data set and the operations on that data
 - » Does not indicate how to store the data or how to implement the operations
 - » Independent of any programming language
- Data Structure
 - » An implementation of an ADT within a programming language

Computer Data Organization (cont.)

- Collection

- » A general term for an ADT that contains a group of objects
- » Some allow duplicate items, some do not
- » Some arrange contents in a certain order, some do not

- Examples of collections

- Bag
- List
- Stack
- Queue
- Dictionary
- Tree
- Graph

Java Review - 1

Object Oriented Programming

- Encapsulation
- Inheritance
- Polymorphism

Encapsulation

- Information hiding
- Enclose **data** and **methods** within a class
- Hide **implementation details**
- Programmer receives only enough information to be able to use the class

Encapsulation

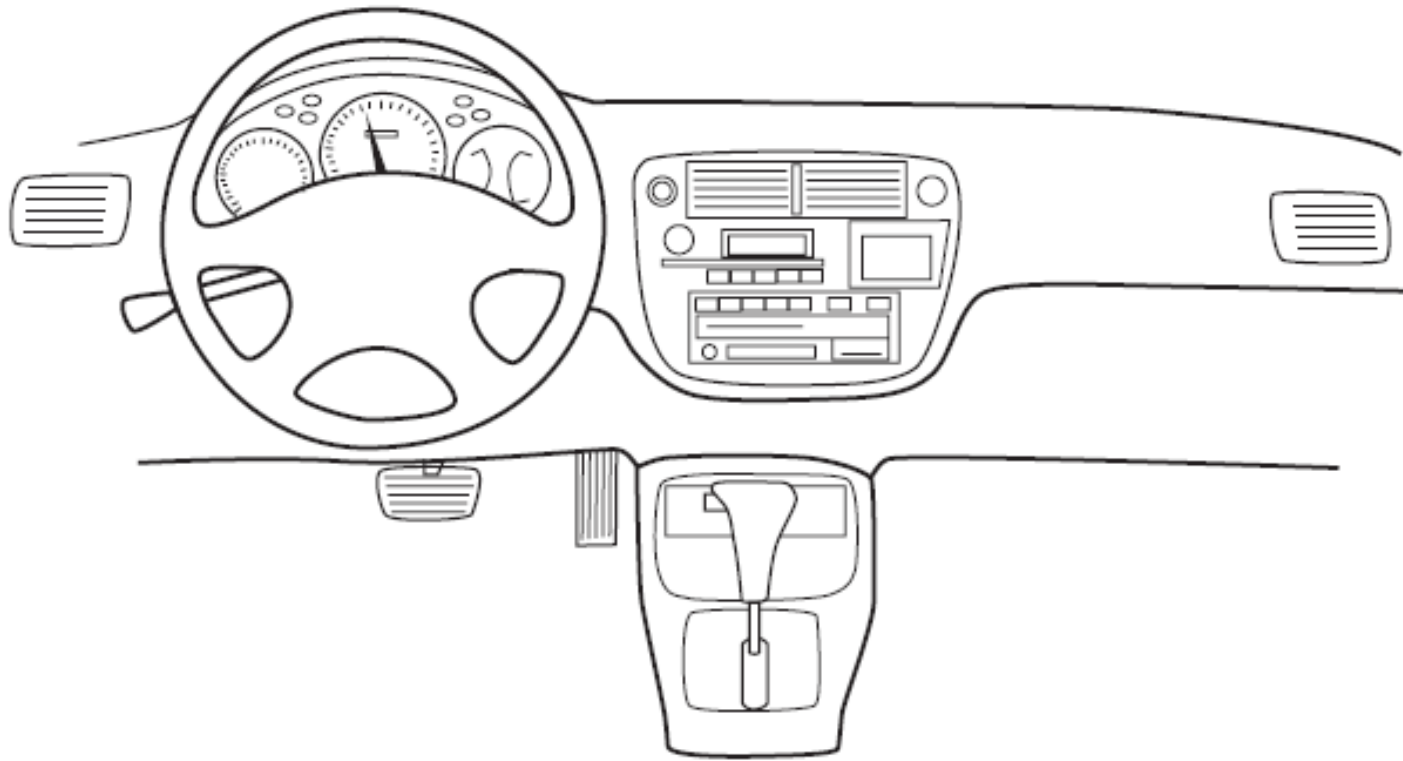


Figure P-1: An automobile's **controls** are visible to the driver, but its **inner workings** are hidden