



COMP 600.226: Data Structures

Jonathan Cohen

Johns Hopkins Department of Computer Science
Course 600.226: Data Structures, Professor: Jonathan Cohen



What this course is about

Data structures:

**conceptual and concrete ways to organize data
for efficient storage and manipulation**

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Why do we need them

Computers take on more and more complex tasks

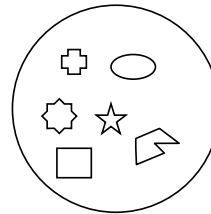
Software implementation and maintenance is difficult

Clean conceptual framework allows for more efficient & more correct code

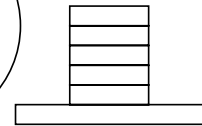
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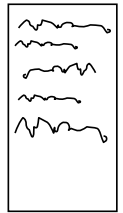
Some example data structures



Set



Stack



List/Sequence

(data + operations)

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What you will learn

What are some of the common data structures

What are some ways we can implement them

How can we analyze their efficiency

How can we use them to solve some practical problems

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Tool Box

Known data structures are tools for solving your future problems

Libraries and packages contain some debugged implementations of these structures

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Why do we study this?

Argument against:

- Packages are already written
- Why not just read documentation of their interfaces and use them?

Argument for:

- You tell me

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Some arguments for

The more you know, the better you can choose the tools

You can modify tools

You can create entirely new tools

You are to become the experts!

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Prerequisites

At least one semester of C++ or Java programming

Easier if you've got two semesters

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What you need

Textbook

- Goodrich and Tomassia. *Data Structures and Algorithms in Java, 3rd edition. 2004.*

Java references (handy, not required)

- Arnold, Gosling, and Holmes. *The Java Programming Language, 3rd edition. 1999.*
- Flanagan. *Java in a Nutshell, 3rd edition. 1999.*

Computer with Java installation

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What you'll be graded on

20% : Written assignments

40% : Programming assignments

15% : Mid-term

25% : Final

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What NOT to do

Plagiarism

Procrastination

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Pair Programming

Extreme programming

- “two minds are better than one”
- One person types/codes, the other watches over shoulder
- Switch roles every ½ hour or so

Divide and conquer

- Decide together how to split up tasks into roughly independent modules
- Code/debug modules independently
- Meet to merge modules and debug combination