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Week 1

Data Structures

Week 1

Discuss and ask questions about Week 1.

Go to forum

459 threads · Last post 3 days ago

Basic Data Structures



In this module, you will learn about the basic data structures used throughout the rest of this course. We start this module by looking in detail at the fundamental building blocks: arrays and linked lists. From there, we build up two important data structures: stacks and queues. Next, we look at trees: examples of how they're used in Computer Science, how they're implemented, and the various ways they can be traversed. Once you've completed this module, you will be able to implement any of these data structures, as well as have a solid understanding of the costs of the operations, as well as the tradeoffs involved in using each data structure.

Less

Learning Objectives

- List the basic data structures
- Analyze operations with data structures
- Choose appropriate basic data structure for a task at hand
- Apply basic data structures in programming challenges
- Develop a program that simulates network packet processing

Less



Coursera Lab Sandbox BETA

- Easily launch Coursera's preconfigured environment for C++, Java, and Python 3 programming
- Get access to all dependencies (libraries and packages) for VSCode—no local software installation required
- Practice C++, Java, and Python 3 programming, run test cases, and work on assignments from your browser



Open Lab Sandbox

Welcome



Reading: About University 10 min



Reading: Welcome 10 min



Reading: Rules on the academic integrity in the course 10 min



Pre-survey on HSE online courses 10 min

Resume

Arrays and Linked Lists



Video: Arrays 7 min



Video: Singly-Linked Lists 9 min



Video: Doubly-Linked Lists 4 min



Reading: Slides and External References 10 min

Stacks and Queues

- ▶ **Video:** Stacks 10 min
 - ▶ **Video:** Queues 7 min
 - 📖 **Reading:** Slides and External References 10 min
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Trees

- ▶ **Video:** Trees 11 min
 - ▶ **Video:** Tree Traversal 10 min
 - 📖 **Reading:** Slides and External References 10 min
 - 📖 **Practice Quiz:** Basic Data Structures 5 questions
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Programming Assignment 1

- 📖 **Reading:** Available Programming Languages 10 min
 - 📖 **Reading:** FAQ on Programming Assignments 10 min
 - 🔗 **Programming Assignment:** Programming Assignment 1: Basic Data Structures 2h Due Aug 2, 1:59 AM CDT
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Acknowledgements (Optional)

- 📖 **Reading:** Acknowledgements 10 min

