Module Two

Learning Objective

By the end of this module, you will meet this learning objective:

- [x] Describe the functional differences between data structures

Module Overview

Welcome to Module Two! The data structures we will be learning about in this class are the common data structures that are used as the building blocks for more complex structures.

- **A data structure** is just a way of organizing, storing, and performing operations on data.

Some of the more common data structures include arrays, linked lists, binary trees, hash tables, heaps, and graphs. This is by no means an exhaustive list of data structures, as programmers create new data structures all the time based on the needs of a program.

A data structure is typically created as a class in object-oriented languages, and generally speaking, any class that stores data could be considered a data structure. Data structures are differentiated based on how the data is stored, what functionality can be performed on the data, how fast each of the pieces of functionality can be performed, and how much space is required to perform the functionality.

Two types of algorithms that are very commonly used are searching and sorting. Searching is the process of finding out whether an element exists in a data structure, and sorting is putting all the elements in a data structure in order. Sorting algorithms are much more varied than searching algorithms. There are countless sorting algorithms that exist, from not-so-efficient to super-efficient. The way the algorithms work and the number of comparisons needed to solve an algorithm are what make the functionality different.

Module at a Glance

This is the recommended plan for completing the reading assignments and activities within the module. Additional information can be found in the module Resources section and on the module table of contents page.

1. Review the Module Two resources.
2. Post your initial response to this week's discussion.
3. Complete the Module Two activities in zyBooks.
4. Complete the Module Two assignment.
5. Post peer responses to the discussion.