

Data Structures and Algorithms in Python

Assignment #11

In this assignment we will be implementing and testing our own LinkedList data structure. This is a precursor to your next major project in which you will create a video about a data structure of your choice.

1. First, read the following sections in *Data Structures and Algorithms in Python*:
 - 7.1 Singly Linked Lists (**not** 7.1.1 and 7.1.2)
 - 7.3 Doubly Linked Lists and 7.3.1 Basic Implementation of a Doubly Linked List (**not** 7.3.2)
 - 7.7 Link-Based vs. Array-Based Sequences
2. We will implement a LinkedList class together, you should upload that code for part of the grade on this assignment. On your own, add extensive tests for all the methods in the LinkedList class. Every method should be tested at least twice, and you should specify the expected outputs using `assert` statements. You should also use a reasonable amount of example data (i.e. don't run your tests on lists with only a few elements).
3. Complete the following reinforcement exercises from *Data Structures and Algorithms in Python*.
 - R-7.2
 - R-7.3
 - R-7.4
 - R-7.8

For these problems you have the option of actually implementing the algorithms in Python, or you can describe the algorithms in writing.