CPE202 – Lab 5

Doubly Linked List

Due: 5/13 @10:00 PM

Implement an ordered list using doubly linked list

Before doing this lab make sure to read over section 4.22, 4.23 carefully. You will be extending the implementation as described in the text.

The structure of an ordered list is a collection of items where each item holds a relative position that is based upon some underlying characteristic of the item. The ordering is typically either ascending or descending and we assume that list items have a meaningful comparison operation that is already defined. Many of the ordered list operations are the same as those of the unordered list.

Implement the following operations for an **ordered list of integers ordered in ascending order** using a **doubly linked list**. Let the "**head**" of the list be where the "smallest item is and let "**tail**" be where the largest item is. To keep track of the head and tail of the list, use a **single dummy node** as shown in class. You will also need to write thorough test cases for each function.

You may use iterative code for many of the methods, but you **must implement** the following methods using recursion:

- **size()**
- **search()**
- **python_list_reversed()**

For these methods, you should use a helper method that will do the recursion.

Notes:

You may assume that all items added to your list can be compared using the '< ' operator, and can be compared for equality. This means that any objects added to the list must have an **__lt__** method and an **__eq__** method. Make no other assumptions about the items in your list.

OrderedList () creates a new ordered list that is empty. It needs no parameters and returns an empty list. Write separate test for each function. The starter files are added in Canvas.

Submit two files to PolyLearn

1. ordered_list.py
2. ordered_list_tests.py

For documentation use signature and purpose statemet of the design recipe for each function (input-output and purpose statement) .For your classes use data definition of design recipe. No need for templet.