CS2302 - Data Structures

Summer 2020

Lab 2

Due Wednesday, July 1, 2020

For this lab you will practice with reference-based lists and evaluation of running times. Implement the following sorting algorithms for objects of the *List* class:

1. *selection_sort(L)* - Sorts *List L* using selection sort.
2. *bubble_sort(L)* - Sorts *List L* using bubble sort. Implement the version of bubble sort that stops execution when no elements are swapped in an iteration.
3. *merge_sort(L)* - Sorts *List L* using merge sort.
4. *quick_sort(L)* - Sorts *List L* using quick sort.

For each of the algorithms, experiment with two types of inputs: random lists and sorted lists. Evaluate the running times of each of the algorithms for each type of input (randomly ordered and already sorted) and different input sizes. Use tables and/or plots to show the relative performance of the algorithms. Use the program *plot_times.py* as a starting point. As usual, write a report describing your work.