Metropolitan State University

ICS 140 Computational Thinking with Programming

Assignment 11

This assignment uses the code from the lab for this week. It involves writing code for the sort algorithms covered in the supplemental reading. The sort\_algorithms.py file included with this lab will have the pseudocode for each algorithm copied in as comments. Your task is to write the python code for each algorithm as its own function.

For the lab, you should have written functions for the selection sort and insertion sort algorithms.

For this assignment, you need to write the bubble sort function and run the sort\_algorithms.py file to compare speed of the algorithms.

Once you have the code working the way you want, paste the bubble sort code below. Run the sort\_algorithms.py file a few times with different sized lists and see how the functions compare. I have also included a test\_sorting\_algorithms.py file that imports mergesort and quicksort algorithms along with the insertion, selection and bubble sort algorithms you have written. If you want, you can run this file instead of the sort\_algorithms.py file for the screenshots below.

The output of the file should look something like this:

Text

Description automatically generated

Or with a larger number it will look like this:

Text

Description automatically generated

If you opt for the test\_sorting\_algorithms.py file, the outputs will look like this:

Text

Description automatically generated

Or using a larger number, you should see a bigger difference in performance.

Text

Description automatically generated

Paste bubble sort code and test screenshots below.

**Python code for bubble sort function**

def bubble\_sort(*mylist*):

length = len(*mylist*)

swapped = True

*while* swapped:

swapped = False

*for* index *in* range(1,length): *# from 1 through length - 1 # <- remove the -1*

*if* *mylist*[index - 1] > *mylist*[index]:

*mylist*[index - 1], *mylist*[index] = *mylist*[index], *mylist*[index - 1]*# swap the entries of mylist at index - 1 and index*

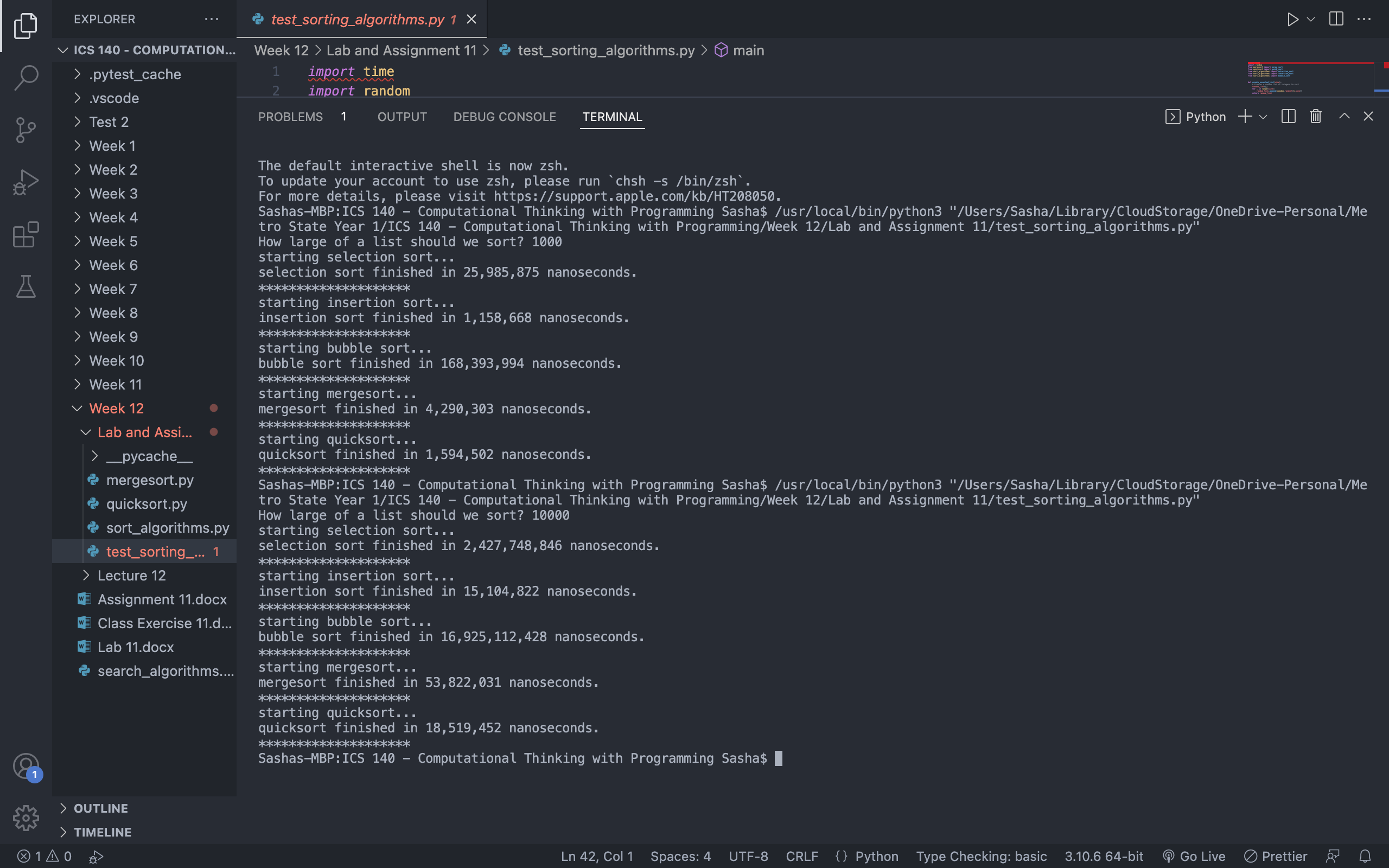
swapped = True

*return* *mylist*

**Screenshots of test runs for a few different list sizes**

**Text

Description automatically generated**

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