Metropolitan State University

ICS 140 Computational Thinking with Programming

Lab 11

This lab is tied in very closely with the assignment 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 need to define functions for the selection sort and insertion sort algorithms. The bubble sort algorithm will count as your assignment for this week. The assignment will also include testing to compare speed of the algorithms.

Once you have the code working the way you want, paste the selection sort and insertion sort code sections below.

**Python code for selection sort function**

def selection\_sort(*mylist*):

index1 = 0

length = len(*mylist*)

*while* index1 < length - 1:

smallest = *mylist*[0]

index2 = index1 + 1

*while* index2 < length:

*if* smallest > *mylist*[1]:

smallest = *mylist*[1]

smallestPosition = index2

smallestPosition, index1 = index1, smallestPosition

*# swap the elements of mylist at smallestPosition and index1*

index2 = index2 + 1

index1 = index1 + 1

*return* *mylist*

**Python code for insertion sort function**

def insertion\_sort(*mylist*):

length = len(*mylist*)

*for* index1 *in* range(length -1):

next = *mylist*[index1 + 1]

location = -1

found = False

index2 = index1

*while* *not* found *and* index2 >= 0:

*if* next >= *mylist*[index2]:

found = True

location = index2

index2 = index2 - 1

*for* index2 *in* range(index1 + 1, location): *# from index1 + 1 to location by -1*

*mylist*[index2] = *mylist*[index2 - 1]

*mylist*[location + 1] = next

*return* *mylist*