Assessment Week 7

1. Runtime Analysis

Array	Function	Time (microsecs)	Array Time Delta	Func. Time Delta
tinyArray	Append	2.54	~	
	Insert	29.73		
smallArray	Append	1.55	~	1
	Insert	5.77		1
mediumArray	Append	21.32	🔺 3.5X	🔺 13X from sArr.append
	Insert	77.83		🔺 13X From sArr.insert
largeArray	Append	90.35	🔺 64X	🔺 4X From mArr.append
	Insert	5,782		🔺 74X From mArr.insert
XLArray	Append	3.25 ms	🔺 259X	🔺 36X From lArr.append
	Insert	842.61 ms		🔺 145X From lArr.insert

When taking array lengths from 10 to 100,000, the .append method increases in time complexity as follows: 1 ▶️ 13X ▶️ 4X ▶️ 36X. Across the same array lengths, the .insert method increases in time complexity as follows: 1 ▶️ 13X ▶️ 74X ▶️ 145X. As it seems, the .append method scales much more efficiently than the .insert method.

This tends to happen because the .append method simply adds data to the end of an array and does not need to spend resources and reassigning the index values of current elements while the .insert method needs to make additional calculations that increase as the size of the array increases.