Sort

Goal: Compare and analyze different sort algorithms

Problem Description

In this assignment you will explore sort algorithms and their time efficiency using research and experimentation.

Here are some suggested sites for research:

https://visualgo.net/en/sorting
https://www.geeksforgeeks.org/

For experimentation, download the Java code and Excel spreadsheet from D2L.

Merge Sort

Answer the following questions:

1. Research Merge Sort. In your own words, how does it work? What is the runtime (big O) of the algorithm?

2. Run the provided code 10 times, recording the responses in the Excel Spreadsheet. Looking at the graph, how do the experimental results compare to the big O? Explain.

3. Copy the timesort method and adapt it to create a sorted array. Run the algorithm. Do you see a difference in the runtime when it starts sorted?

4. Do you have any other observations?

Quick Sort

Answer the following questions:

1. Research Quick Sort. In your own words, how does it work? What is the runtime (big O) of the algorithm?

2. Run the provided code 10 times, recording the responses in the Excel Spreadsheet. Looking at the graph, how do the experimental results compare to the big O? Explain.

3. Copy the timesort method and adapt it to create a sorted array. Run the algorithm. Do you see a difference in the runtime when it starts sorted?

4. Do you have any other observations?

Shell Sort

Answer the following questions:

1. Research Shell Sort. In your own words, how does it work? What is the runtime (big O) of the algorithm?

2. Run the provided code 10 times, recording the responses in the Excel Spreadsheet. Looking at the graph, how do the experimental results compare to the big O? Explain.

3. Copy the timesort method and adapt it to create a sorted array. Run the algorithm. Do you see a difference in the runtime when it starts sorted?

4. Do you have any other observations?