CIS263 Assignment Nine

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Complete the following:

1) Write a program that inputs N elements. A heap data structure should be created to hold the N elements using the following two methods:
    a. Elements inserted into the heap data structure one at a time
    b. Use all the elements to build a heap in linear time (pass all the elements in at once)
2) The input/creation process should be repeated 3 times:
    a. the input elements should be sorted
    b. the input elements should be sorted in reverse order
    c. the input elements should be randomized.
3) Analyze the execution times for each of the 6 different approaches.
4) If a d-heap is stored as an array, for an entry located in position i, where are the parents and children? Give examples demonstrating your formula is correct.

Note: The difference between 1a and 1b is that in 1a the elements are input one at a time. In 1b, all of the elements are input.

Approved programming languages: C, C++, C#, Python, Java.

Hand-in:

1. A file containing the source code for numbers 1 & 2
2. The output demonstrating the analysis of your program for numbers 1 & 2
3. The analysis for number 3
4. The answer to number 4

Note: Please do not upload zip files

Grading Rubric

	0%	50%	100%
Analysis of the run-time comparison (20%)	Incomplete	Partially complete	Complete
Run time comparison demonstrated programmatically for step 3(60%)	Not demonstrated clearly	Limited demonstration	Clearly demonstrated
Correct locations for step 4 (20%)	None correct	Children or parent correct	Both correct

See blackboard for point breakdown.