Java Data Structures

Module Quiz

Module 1: Algorithms and Complexities

1. Out of the following list, which runtime complexity scales the worst?

a. *O(1)*

b. *O(n)*

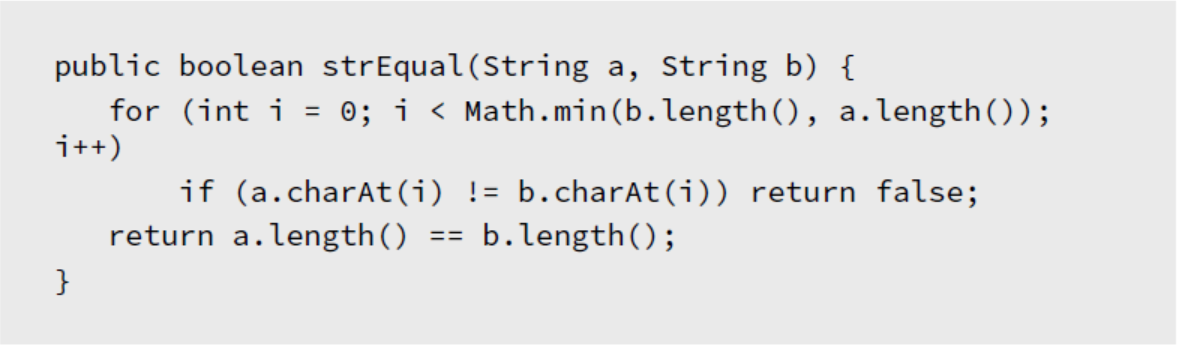
c. *O(n2)*

d. *O(log n)*

Analysis:

1. Incorrect. See Module 1: Algorithms and Complexities, Lesson 1.2: Measuring Algorithmic Complexity with Big O Notation.
2. Incorrect. See Module 1: Algorithms and Complexities, Lesson 1.2: Measuring Algorithmic Complexity with Big O Notation.
3. Correct. See Module 1: Algorithms and Complexities, Lesson 1.2: Measuring Algorithmic Complexity with Big O Notation.
4. Incorrect. See Module 1: Algorithms and Complexities, Lesson 1.2: Measuring Algorithmic Complexity with Big O Notation.

2. What is the runtime complexity of the following code?

a. *O(10ⁿ)*

b. *O(n)*

c. *O(n log n)*

d. *O(1)*

Analysis

1. Incorrect. See Module 1: Algorithms and Complexities, Lesson 1.3: Identifying Algorithms with Different Complexities.
2. Correct. See Module 1: Algorithms and Complexities, Lesson 1.3: Identifying Algorithms with Different Complexities.
3. Incorrect. See Module 1: Algorithms and Complexities, Lesson 1.3: Identifying Algorithms with Different Complexities.
4. Incorrect. See Module 1: Algorithms and Complexities, Lesson 1.3: Identifying Algorithms with Different Complexities.

3. The binary search algorithm has a big O of which of the following?

a. *O(log n)*

b. *O(2ⁿ)*

c. *O(n log n)*

d. *O(1)*

Analysis:

1. Correct. See Module 1: Algorithms and Complexities, Lesson 1.3: Identifying Algorithms with Different Complexities.
2. Incorrect. See Module 1: Algorithms and Complexities, Lesson 1.3: Identifying Algorithms with Different Complexities.
3. Incorrect. See Module 1: Algorithms and Complexities, Lesson 1.3: Identifying Algorithms with Different Complexities.
4. Incorrect. See Module 1: Algorithms and Complexities, Lesson 1.3: Identifying Algorithms with Different Complexities.

4. If we developed an algorithm that performs *5 + 2 log n + n* operations, we can say that the algorithm has a complexity of which of the following?

a. *O(n2)*

b. *O(5)*

c. *O(log n)*

d. *O(n)*

Analysis

1. Incorrect. See Module 1: Algorithms and Complexities, Lesson 1.2: Measuring Algorithmic Complexity with Big O Notation.
2. Incorrect. See Module 1: Algorithms and Complexities, Lesson 1.2: Measuring Algorithmic Complexity with Big O Notation.
3. Incorrect. See Module 1: Algorithms and Complexities, Lesson 1.2: Measuring Algorithmic Complexity with Big O Notation.
4. Correct. See Module 1: Algorithms and Complexities, Lesson 1.2: Measuring Algorithmic Complexity with Big O Notation.