

Data structure using Java Quiz1 Online

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Consider the following code segment.

```
count = 0;
i = 1;
do{
    value = N;
    while (value > 1)
    { value = value / 2;
      count++; }
    i++;
} while (i <= N);
```

Which of the following describes the growth rate of the above code segment using Big O notation?

a) N^2

- b) $\log N$
- c) N
- d) None of the above

- ☐ a)
- ☒ b)
- ☐ c)
- ☐ d)

*

Consider the following time function:

$$f(N) = 2^{N+1} + N^2$$

The Big O notation expresses the growth rate of the above function is:

- a) N^2
- b) 2^N
- c) N
- d) None of the above

- ☐ a)
- ☒ b)
- ☐ c)
- ☐ d)

*

Among the following time functions, which one exhibits the slowest growth rate?

$$f(N) = N^2 + N + N^{1/2} + N^{3/2} + (\log_2 N)^2 + N^2 \quad (N^2 + 3N + 2)$$

$$g(N) = 3N \log_2 N + 6N + 5 + N^3$$

- a) $f(N)$
- b) $g(N)$
- c) Both are equal

- ☒ a)
- ☐ b)
- ☐ c)

*

Among the following time functions, which one is on the order of 2^N ?

- a) $f(N) = N^{3/2} + N^4 + 2^{N+1} + N^4 + N \log_2 N + 2^{3N+4} + N$
- b) $f(N) = N^2 + 2^N + N! + 3N + 2$
- c) $f(N) = 3N \log_2 N + 6N + 5 + N^3$
- d) None of the above

- ☐ a)
- ☒ b)
- ☐ c)
- ☐ d)

*

Among the following time functions, which one exhibits the slowest growth rate?

$$f(N) = \log_2 N + 6N + 5N \log_2 N + (\log_2 N)^2$$

$$g(N) = 2N \log_2 5 + 6(\log_2 N)^3 + 5 + 3$$

- a) $f(N)$
- b) $g(N)$
- c) Both are equal

☒ a)

☐ b)

☐ c)

*

Among the following time functions, which one exhibits the slowest growth rate?

$$f(N) = N^6 + 2N + 2^N + 2N \log_2 N$$

$$g(N) = 3(\log_2 N)^2 + 2N + 5(\log_2 N)^3 + N! + 6$$

- a) $f(N)$
- b) $g(N)$
- c) Both are equal

☐ a)

☒ b)

☐ c)

*

Consider the following code segment.

```
int count = 0;
{
  for (i = 1; i <= N; i++) count++;
  for (i = N; i >= 0; i--) count++;
  for (i = 1; i <= N; i++) count++;
}
```

Which of the following describes the growth rate of the above code segment using Big O

notation?

- a) N^2
- b) N^3
- c) N
- d) None of the above

☐ a)

☐ b)

☒ c)

☐ d)

*

Consider the following time function:

$$f(N) = 4^N + N^4$$

The Big O notation expresses the growth rate of the above function is:

- a) N^4
- b) 2^N
- c) N
- d) None of the above

☐ a)

☒ b)

☐ c)

☐ d)

*

Among the following time functions, which one is on the order of N^4 ?

- a) $f(N) = N^4 + 3N \log_2 N + 5 + N^3 + 4N^2 + 2^N + 2N$

b) $f(N) = N^4 + N^3 + 4N^2 (2N + 1) + N! + N^7 + 7$

c) $f(N) = N^2 + N + N^{1/2} + N^{3/2} + (\log_2 N)^2 + N^2 (N^2 + 3N + 2)$

d) None of the above

☐ a)

☐ b)

☐ c)

☒ d)

*

Does the provided function aim to effectively remove a node containing the specified data from a Singly Circular Linked List?

```
public ListNode insertInSortedList(int value) {
    ListNode newNode = new ListNode(value);
    if (head == null) { return newNode; }
    ListNode current = head;
    ListNode temp = null;

    while (current != null && current.data < newNode.data) {
        temp = current;
        current = current.next;
    }
    newNode.next = current;
    temp.next = newNode;
    return head;
}
```

a) Correct

b) Not correct

☐ a)

☒ b)

*

Among the following time functions, which one exhibits the slowest growth rate?

$f(N) = (\log_2 N)^4 + N! + 2^{N+1} + 5(\log_2 N)^2 + 6N$

$$g(N) = 13 + 5 N \log_2 N + 6 (\log_2 N)^4 + 5$$

- a) $f(N)$
- b) $g(N)$
- c) Both are equal

☒ a)

☐ b)

☐ c)

*

Among the following time functions, which one exhibits the slowest growth rate?

$$f(N) = 5N + 2^5 + 16N^3 + 3(\log_2 N)^5 + 2N \log_2 N + N^2$$

$$g(N) = N^{3/2} + N^4 + 2^{N+1} + N^4 + N \log_2 N + 2^{3N+4} + N$$

- a) $f(N)$
- b) $g(N)$
- c) Both are equal

☐ a)

☒ b)

☐ c)

*

Among the following time functions, which one is on the order of $(\log_2 N)^3$?

a) $f(N) = 2N \log_2 5 + 6(\log_2 N)^3 + 5 + 3$

b) $f(N) = 6 + (\log_2 N)^3 + 3 + (\log_2 N)^2 + 5$

c) $f(N) = 3 N \log_2 N + 2 N \log_2 N + 2 N + 6 N (3 N + 2)$

d) None of the above

☒ a)

☐ b)

☐ c)

☐ d)

*

Among the following time functions, which one is on the order of $\log_2 N$?

a) $f(N) = 12 + 3 \log_2 N + 6 N + (\log_2 N)^2 + 9$

b) $f(N) = 13 + 5 N \log_2 N + 6 (\log_2 N)^4 + 5$

c) $f(N) = 18 (\log_2 N)^5 + 6 (20 \log_2 N + 2)$

d) None of the above

☒ a)

☐ b)

☐ c)

☐ d)

*

Among the following time functions, which one is on the order of 2^N ?

a) $f(N) = N^2 + 2 N + N! + 2^N + 2 N \log_2 N$

b) $f(N) = 2^{3N+4} + 6 N + 5 + N^4 + (\log_2 N)^2 + 5 N (N^2 + 4N)$

c) $f(N) = (\log_2 N)^4 + N! + 2^{N+1} + 5 (\log_2 N)^2 + 6 N$

d) None of the above

☒ a)

☐ b)

☐ c)

☐ d)

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