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CMSC 256

Assignment 3

Questions

1. a, b, d, h, i, e, j, c, f, k, g, l, m

2.

3.

a. False

b. True

c. True

d. True

4.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Index | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Hash code | 0 | 7 | 1 | 3 | 11 | 9 |  |

5.

|  |  |  |
| --- | --- | --- |
| Expression | Dominant term(s) | O(…) |
| 500n+100n2+200nlog10n | 100n2 | O(n2) |
| 0.3n+10n1.5+5n1.75 | 5n1.75 | O(n1.75) |
| 0.003log4n + log2log2n | log2log2n | O(log2log2n) |
| 0.01nlog2n+n(log2n)2 | n(log2n)2 | O(n(log2n)2) |
| n2log2n+n(log2n)2 | n2log2n | O(n2log2n) |

6.

1) Empty tree

2)

3)

4)

5)

Bonus Question:

3n has a higher growth rate than n\*2n , because exponentials grow very fast, especially one with a higher base. N\*2n just grow not fast enough to keep up with 3n. The result for all the numbers from 1 and up I plugged in for n are higher for 3n.

References

Fung, Carol. “Linked List.” Lecture.

Goodrich, Michael T., and Roberto Tamassia. Data Structures and Algorithms in Java. New York:

John Wiley, 2014. Print.