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CS 3130

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**Project 3**

Results:

|  |  |  |  |
| --- | --- | --- | --- |
| **N** | **t = 5** | **t = 10** | **t = 15** |
| **100** | 12.6 | 11.8 | 11.9 |
| **500** | 18.4 | 17.7 | 19.7 |
| **1000** | 20.6 | 20.9 | 20.9 |

Theoretical:

|  |  |  |
| --- | --- | --- |
| **Average** h = - 1 | **Worst** h = N - 1 | **Best** h = lg(N+1) - 1 |
| 52.33 | 99 | 5.66 |
| 253.48 | 499 | 7.97 |
| 503.98 | 999 | 8.97 |

On average the height of a binary search tree created from a randomly generated array was between the best and worst case scenario, but is much lower than the theoretical average. This is most likely due to the low probably of the worst case scenario while created a binary search tree from a randomly generated array.

Duplicates, when inserted into the binary search tree were placed in the right subtree. This choice was made in respect to the successor function. If the duplicate value is deleted, the same value will be selected as its successor and tree will remain mostly the same with the duplicate in the subtree removed.