Aeriel Denmark

CS 300 - DSA: Analysis and Design

Yurik - 6-2 Project One

\***due Sun 6/11/23**\*

Runtime Analysis

Vector Data Structure Pseudocode

|  |  |
| --- | --- |
| Opening the file | O(1) |
| Initializing the Vector | O(1) |
| Initializing the Set | O(1) |
| Read each line from the file | O(n) |
| Split the line | O(1) |
| Two Params Line | O(1) |
| Pre-Requisites Exist | O(k) |
| Create New Course Object | O(1) |
| Storing the course object in the Vector | O(1) |
| Add course number to the set | O(1) |
| Close the file | O(1) |

Hash Table Data Structure Pseudocode

|  |  |
| --- | --- |
| Opening the file | O(1) |
| Initializing the Hash Table | O(1) |
| Read each line from the file | O(n) |
| Split the line | O(1) |
| Two Params Line | O(1) |
| Extract Course Info | O(1) |
| Pre-Requisites Exist | O(1) |
| Create New Course Object | O(1) |
| Insert the course into the hash table | O(1) |
| Close the file | O(1) |

Binary Search Tree Data Structure Pseudocode

|  |  |
| --- | --- |
| Opening the file | O(1) |
| Initializing data structures | O(1) |
| Read each line from the file | O(n) |
| Split the line | O(1) |
| Two Params Line | O(1) |
| Pre-Requisites Exist | O(k) |
| Create New Course Object | O(1) |
| Add the course to the vector | O(1) |
| Insert the course into the binary search tree | O(log n) |
| Close the file | O(1) |

Alphanumeric Pseudocode

|  |  |
| --- | --- |
| Opening the file | O(1) |
| Initializing the list | O(1) |
| Read each line from the file | O(n) |
| Split the line | O(1) |
| Extract course number and title | O(1) |
| Create New Course Object | O(1) |
| Store course object in list | O(1) |
| Sort course list | O(n log n) |
| Print sorted list | O(n) |
| Worst case time complexity | O(n log n) |