Cameron Lee

Excerpt from Project One

**Runtime Analysis**

Vector Runtime Analysis

|  |  |  |  |
| --- | --- | --- | --- |
| Code | Line Cost | # Times Executed | Total Cost |
| While file is not at the end of file | 1 | n | n |
| Create a string vector for course information | 1 | 1 | 1 |
| Create string value courseInfo | 1 | 1 | 1 |
| Getline from course file for courseInfo | 1 | 1 | 1 |
| While courseInfo exists | 1 | n | n |
| Get substring of each courseInfo by finding commas | 1 | n | n |
| Push\_back courseInfo from substring, separating data | 1 | 1 | 1 |
| Load the values into a specific course using elements | 1 | 1 | 1 |

Total Cost: 3n + 5

Runtime: O(n)

Hash Table Analysis

|  |  |  |  |
| --- | --- | --- | --- |
| Code | Line Cost | # Times Executed | Total Cost |
| While the file is not at the end of the file | 1 | n | n |
| Create a node structure | 3 | 1 | 3 |
| Create a course pointer | 1 | n | n |
| Create a next node | 1 | 1 | 1 |
| Declare integer “key” | 1 | 1 | 1 |
| Create a node pointer | 1 | n | n |
| Make key equal to uint\_max | 1 | 1 | 1 |
| Set the next node to null | 1 | n | n |
| Set the new course to the node pointer | 1 | n | n |
| Set the course pointer to new course | 1 | n | n |
| Set the newcourse “key” to the newcourse node | 1 | 1 | 1 |

Total Cost: 6n + 7

Runtime: O(n)

Binary Search Tree Analysis

|  |  |  |  |
| --- | --- | --- | --- |
| Code | Line Cost | # Times Executed | Total Cost |
| Construct a binary search tree total prerequisite | 1 | 1 | 1 |
| Set the root node as null | 1 | 1 | 1 |
| Set variable course prerequisite to left child node of course node | 1 | 1 | 1 |
| Set variable course prerequisite to right child node of course node | 1 | 1 | 1 |
| For every prerequisite in course prerequisite | 1 | n | n |
| Add prerequisite to total prerequisite | 1 | 1 | 1 |