| **Code for Vector** | **Line Cost** | **# Times Executes** | **Total Cost** |
| --- | --- | --- | --- |
| **Define a vector data structure to hold courses** | 1 | 1 | 1 |
| **If the file is open** | 1 | 1 | 1 |
| **While the file is good** | 1 | n | n |
| **Get line information** | 1 | n | n |
| **If the line does not equal a space** | 1 | n | n |
| **Push back line** | 1 | n | n |
| **Loop through the file** | 1 | n | n |
| **initialize a data structure to add the courses** | 5 | n | 5n |
| **Append course into the data structure** | 1 | n | n |
| **Total Cost** | | | 11n + 2 |
| **Runtime** | | | O(n) |

| **Code for hash table** | **Line Cost** | **# Times Executes** | **Total Cost** |
| --- | --- | --- | --- |
| **Define the hash table to hold courses** | 3 | 1 | 3 |
| **If the file is open** | 1 | 1 | 1 |
| **While the file is good** | 1 | n | n |
| **Get line information** | 1 | n | n |
| **If the line does not equal a space** | 1 | n | n |
| **Push back line** | 1 | n | n |
| **Loop through the file** | 1 | n | n |
| **Set the key to a largest unsigned integer**  **maximum value.** | 1 | n | n |
| **Set next equal to a null pointer.** | 1 | n | n |
| **Set the key equal to the hash with the**  **parameter course.** | 1 | n | n |
| **Create a hash table for course item** | 1 | n | n |
| **Create a key for a given course** | 1 | 1 | 1 |
| **Get information from each line** | 1 | n | n |
| **Add the course to an empty bucket** | 1 | n | n |
| **If a prerequisite exists add the course to the corresponding course bucket** | 1 | n | n |
| **Total Cost** | | | 12n + 5 |
| **Runtime** | | | O(n) |

| **Code Binary Search Tree** | **Line Cost** | **# Times Executes** | **Total Cost** |
| --- | --- | --- | --- |
| **Define a binary search tree** | 3 | 1 | 3 |
| **If the file is open** | 1 | 1 | 1 |
| **While the file is good** | 1 | n | n |
| **Get line information** | 1 | n | n |
| **If the line does not equal a space** | 1 | n | n |
| **Push back line** | 1 | n | n |
| **Loop through the file** | 1 | n | n |
| **Create a data structure to add the courses** | 1 | 1 | 1 |
| **If node > course, add to left subtree** | 3 | n | 3n |
| **Else{** | 0 | 0 | 0 |
| **If the node exists keep traversing}** | 1 | n | n |
| **Else {** | 0 | 0 | 0 |
| **If node < course, add to right subtree}** | 2 | n | 2n |
| **Else {** | 0 | 0 | 0 |
| **If the node exists keep traversing}** | 1 | n | n |
| **Total Cost** | | | 12n + 5 |
| **Runtime** | | | O(n) |