**Runtime Analysis**

**Vector-Based Search:**

| Code Line | Cost | # Times Executes | Total Cost |
| --- | --- | --- | --- |
| FOR EACH course IN courseList | 1 | n | n |
| IF course.courseNumber == userInput | 1 | n | n |
| FOR EACH prereq IN course.prerequisites | 1 | 1 | 1 |
| PRINT each prereq | 1 | n | n |

**Total Cost:** 3n + 1  
**Runtime Complexity:** O(n)

**Hash Table-Based Search:**

* Lookup operation: O(1) on average
* Insert operation: O(1) on average
* Delete operation: O(1) on average

**Binary Search Tree (Balanced):**

* Lookup operation: O(log n)
* Insert operation: O(log n)
* Delete operation: O(log n)

**Binary Search Tree (Unbalanced worst case):**

* Lookup operation: O(n)
* Insert operation: O(n)
* Delete operation: O(n)