**Evaluate the run-time and memory of data structures**

**Vector**

|  |  |  |  |
| --- | --- | --- | --- |
| Code | Line Cost | # Times Executed | Total Cost |
| for all courses | 1 | N | N |
| if the course is the same as courseNumber | 1 | N | N |
| print out the course information | 1 | 1 | 1 |
| for each prerequisite of the course | 1 | N | N |
| print the prerequisite course information | 1 | N | N |
| **Total Cost** |  |  | 4n+1 |
| **Runtime** |  |  | 0(n) |

**Hash Table**

|  |  |  |  |
| --- | --- | --- | --- |
| Code | Line Cost | # Times Executed | Total Cost |
| for all courses | 1 | N | N |
| if the course is the same as courseNumber | 1 | 1 | 1 |
| print out the course information | 1 | 1 | 1 |
| for each prerequisite of the course | 1 | N | N |
| print the prerequisite course information | 1 | N | N |
| **Total Cost** |  |  | 3n+3 |
| **Runtime** |  |  | 0(n) |

**Binary Search Tree**

|  |  |  |  |
| --- | --- | --- | --- |
| Code | Line Cost | # Times Executed | Total Cost |
| for all courses | 1 | N | N |
| if the course is the same as courseNumber | 1 | Log n | Log n |
| print out the course information | 1 | 1 | 1 |
| for each prerequisite of the course | 1 | N | N |
| print the prerequisite course information | 1 | N | N |
| **Total Cost** |  |  | 3n+log n + 1 |
| **Runtime** |  |  | 0(n) |