CS 300 Project One runtime analysis

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**Vector**

| Code | Line Cost | # Times Executes | Total Cost |
| --- | --- | --- | --- |
| For all courses | 1 | n | n |
| If the course is the same as courseNumber | 1 | n | n |
| Print out the course information | 2 | 1 | 1 |
| For each prerequisite of the course | 1 | n | n |
| Print the prerequisite course information | 2 | n | n |
|  |  | Total Cost | 6n + 1 |
|  |  | Runtime | 1(n) |

**Hash Table**

| Code | Line cost | # times executes | Total Cost |
| --- | --- | --- | --- |
| For all courses | 2 | **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 | **2** | **n** | **n** |
| Print the prerequisite course information | **4** | **n** | **n** |
|  |  | Total Cost | 9n + 1 |
|  |  | Runtime | O(n) |

**Tree**

| **Code** | **Line Cost** | **# Times Executes** | **Total Cost** |
| --- | --- | --- | --- |
| **For all courses** | **1** | **n** | **n** |
| **If the course is the same as courseNumber** | **1** | **n** | **n** |
| **Print out the course information** | **2** | **1** | **1** |
| **For each prerequisite of the course** | **1** | **n** | **n** |
| **Print the prerequisite course information** | **4** | **n** | **n** |
|  |  | **Total Cost** | **8n + 1** |
|  |  | **Runtime** | **O(n)** |