Analysis of runtime for this project for the different data structures.

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 | 1 | 1 | 1 |
| For each prerequisite | 1 | n | n |
| Print the prerequisite course info | 1 | n | n |
|  | Total cost |  | 4n+1 |
|  | Runtime |  | 0(n) |

HashTable:

|  |  |  |  |
| --- | --- | --- | --- |
| Code | Line Cost | #Times Executes | Total Cost |
| For all courses | 1 | 1 | 1 |
| If the course is the same as courseNumber | 1 | 1 | 1 |
| Print out the course information | 1 | 1 | 1 |
| For each prerequisite | 1 | 1 | 1 |
| Print the prerequisite course info | 1 | n | n |
|  | Total cost |  | 4n+1 |
|  | Runtime |  | 0(1) |

Tree:

|  |  |  |  |
| --- | --- | --- | --- |
| Code | Line Cost | #Times Executes | 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 | 1 | n | n |
| Print the prerequisite course info | 1 | n | n |
|  | Total cost |  | 4n+1 |
|  | Runtime |  | 0(log(n)) |