**Print** Menu

**Print** “1: Load Data Structure”

**Print** “2: Print Course List”

**Get course list**

**Organize List alphanumeric**

**Print Organized\_List**

**Print** “3: Print Course Info”

**Print**  “ Enter Course”

**Get Course Info**

**Print Course Info**

**Print** “4: Exit”

Vector Structure

**Get course infographic list**

**Get Course Int**

**Check** prerequisites for the course

**If Prerequisites are completed**

**If Course Int is same as Course Num**

**Print all Course Information**

**Get course grade**

**If passed**

**Increase Course Int +1 Course**

**Else**

**Redo same course**

**Loop;**

**Else**

**Print** prerequisite information that is required

Hash Table Structure

**Get course infographic list**

**Get Course Int**

**Check** prerequisites for the course

**If Prerequisites are completed**

**If Course Int is same as Course Num**

**Print all Course Information**

**Get course grade**

**If passed**

**Increase Course Int +1 Course**

**Else**

**Redo same course**

**Loop;**

**Else**

**Print** prerequisite information that is required

Tree Structure

**Get course infographic list**

**Get Course Int**

**Check** prerequisites for the course from tree data structure

**If Prerequisites are completed**

**If Course Int is same as Course Num**

**Print all Course Information** from tree data structure

**Get course grade**

**If passed**

**Increase Course Int +1 Course** from tree data structure

**Else**

**Redo same course**

**Loop;**

**Else**

**Print** prerequisite information that is required from tree data structure

Vector Run Time

| **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 of the course** | 1 | 1 | 1 |
| **print the prerequisite course information** | 1 | 1 | 1 |
| **Total Cost** | | | 5 |
| **Runtime** | | | O(n) |

Hash Table Run Time

| **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 of the course** | 1 | 1 | 1 |
| **print the prerequisite course information** | 1 | 1 | 1 |
| **Total Cost** | | | 5 |
| **Runtime** | | | O(1) |

Tree Table Run Time

| **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 of the course** | 1 | 1 | 1 |
| **print the prerequisite course information** | 1 | 1 | 1 |
| **Total Cost** | | | 5 |
| **Runtime** | | | O(n) |