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10 < Abigail, Audrey, Jeffrey > 
11

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Background;

A course management system is a program that allows educational institutions to efficiently manage their courses, students, and related information. It enables administrators to add, remove, modify courses, view course details, search for courses, and manage student enrollments.



Objective {

The objective is to determine the most efficient data structure for implementing a Course Management System. The goal is to minimize the time complexity of these operations and maximize system performance.

}

Solution {

To address the problem, a comparative analysis of different data structures can be performed to identify the most efficient one for the Course Management System.

}



```
1  Data_Structures_Used {
2
3  |
4  |   Linked List;
5  |
6  |   ArrayList;
7  |
8  |
9  |   Hash Map;
10 |
11 |
12 |   Binary Search Tree;
13 |
14 }
```



Features_available {

addCourse



allows the user to add a new course to the system.

removeCourse

allows the user to remove a course from the system.

modifyCourse

allows the user to update the details of an existing course.

viewCourse

allows the user to view the details of all stored courses.

addStudent

allows the user to add a student to a particular course.

searchCourse



allows the user to find a course based on the course's name.

removeStudent

allows the user to remove a student from a specific course.

}



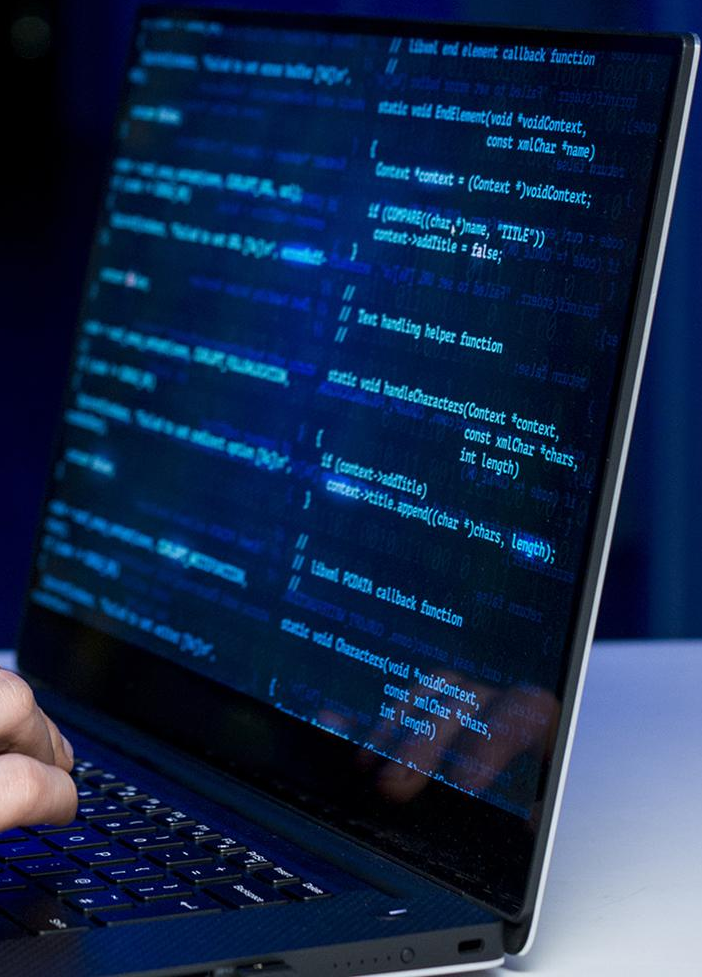
```
1  
2  
3  
4 < "Deleted code is debugged code." >  
5  
6  
7 // words i live by  
8  
9 - JeffTheDebugger  
10  
11  
12  
13  
14
```

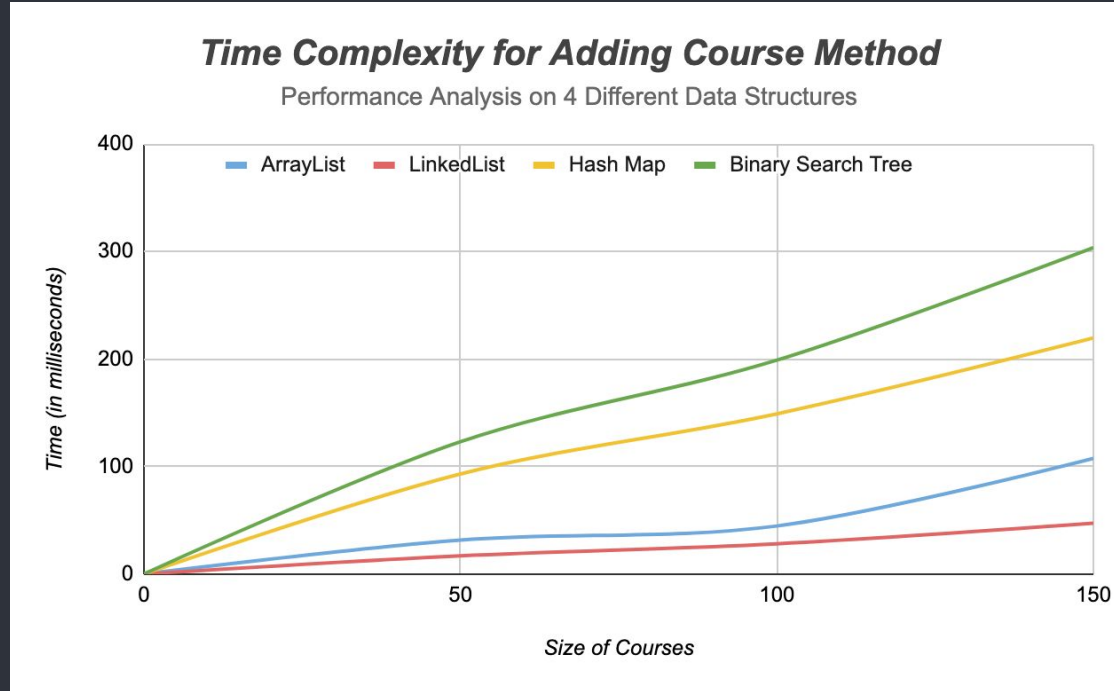


A 'graph' is {
Worth a Thousand
Words



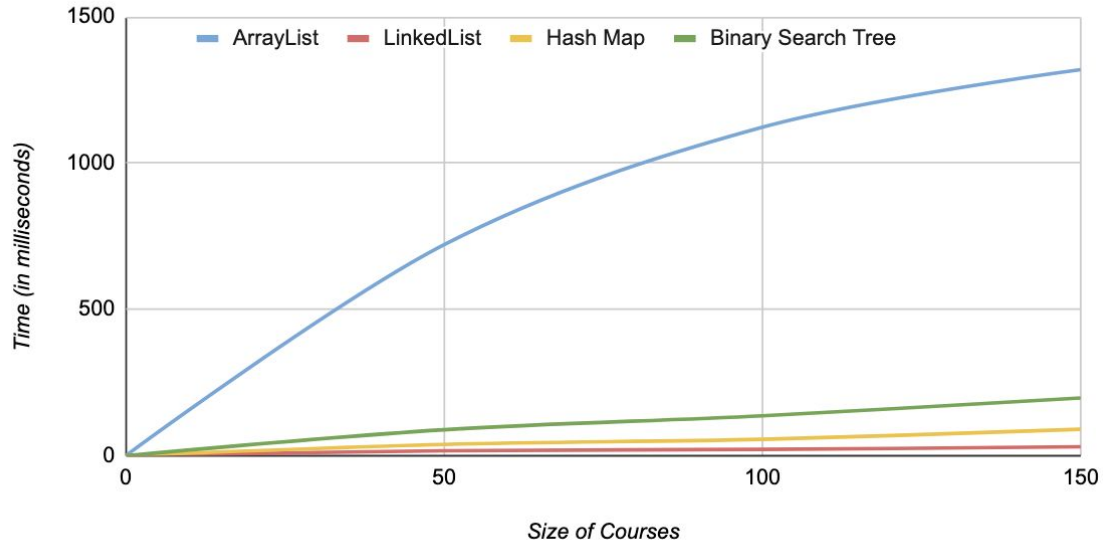
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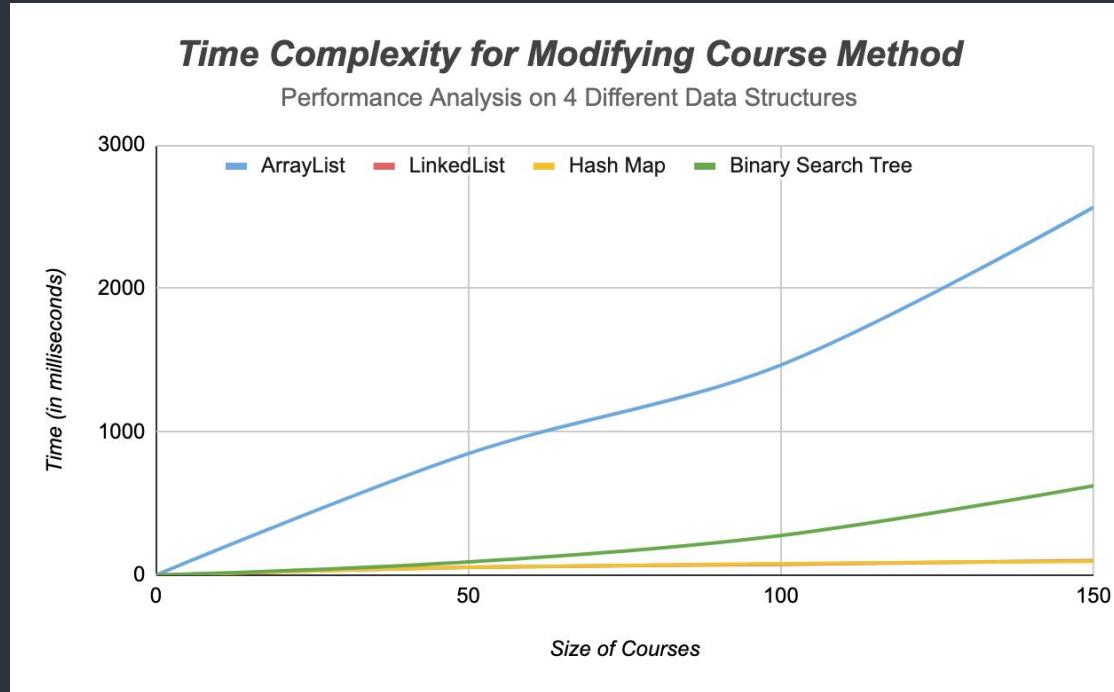




Time Complexity for Removing Course Method

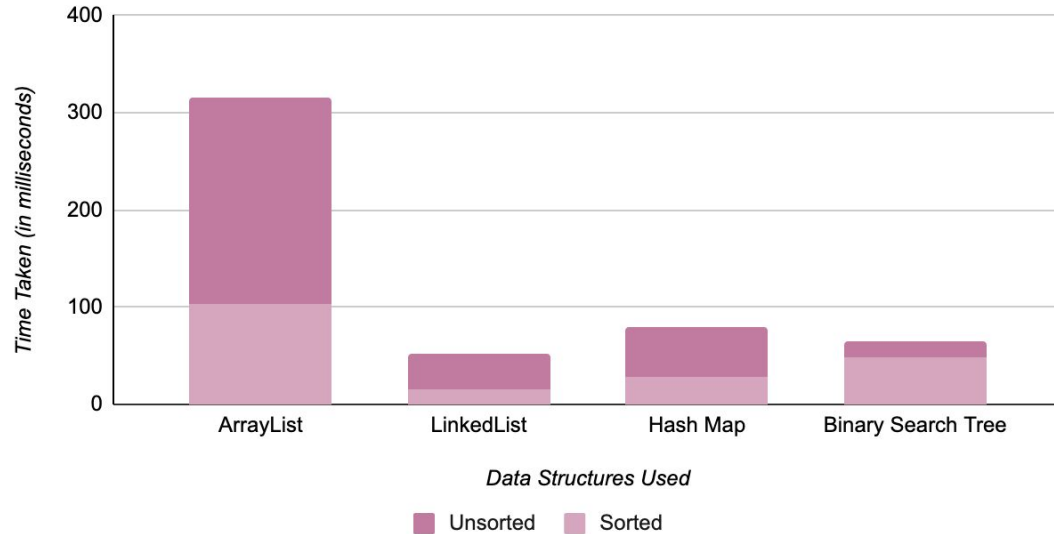
Performance Analysis on 4 Different Data Structures

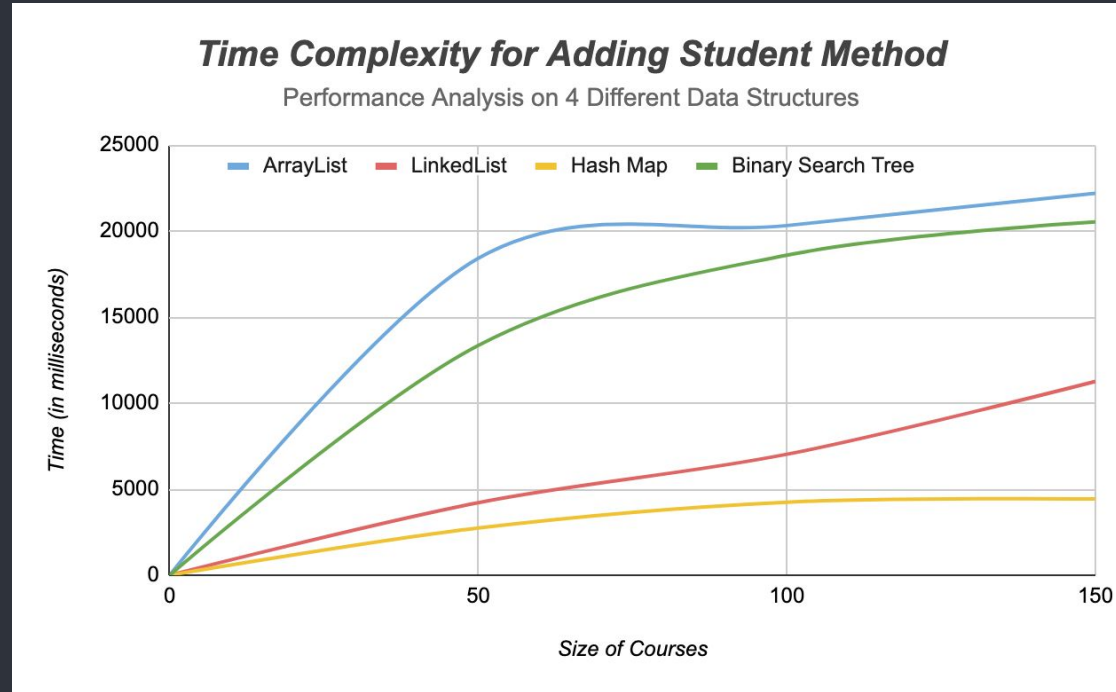




Time Complexity for Searching Course Method

Performance Analysis on 4 Different Data Structures (Sorted and Unsorted)





Time Complexity for Removing Student Method

Performance Analysis on 4 Different Data Structures

