

Microsoft Visual Studio Debug Console

Employee table using linked lists

Employees with salary 2000: Yara/  
Employees with salary 3000: Fatma/  
Employees with salary 4000: Ayman/  
Employees with salary 5000: Fawzy/  
Employees with salary 6000: Aya/  
Employees with salary 7000: Abdallah/  
Employees with salary 8000: Mariam/  
Employees with salary 9000: Roshdy/  
Employees with salary 10000: Mina/  
Number of collisions: 0

Employee table after removing Abdallah

Employees with salary 2000: Yara/  
Employees with salary 3000: Fatma/  
Employees with salary 4000: Ayman/  
Employees with salary 5000: Fawzy/  
Employees with salary 6000: Aya/  
Employees with salary 8000: Mariam/  
Employees with salary 9000: Roshdy/  
Employees with salary 10000: Mina/

Employee table using dynamic arrays

Employee: Yara  
Age: 19  
Salary: 2000  
Years of experience: 0

Employee: Fatma  
Age: 21  
Salary: 3000  
Years of experience: 1

Employee: Ayman  
Age: 33  
Salary: 4000  
Years of experience: 8

Employee: Fawzy  
Age: 45  
Salary: 5000  
Years of experience: 8

Employee: Aya  
Age: 26  
Salary: 6000  
Years of experience: 3

Employee: Abdallah  
Age: 29  
Salary: 7000  
Years of experience: 4

Employee: Mariam  
Age: 32

Salary: 8000  
Years of experience: 2

Employee: Roshdy  
Age: 28  
Salary: 9000  
Years of experience: 3

Employee: Mina  
Age: 30  
Salary: 10000  
Years of experience: 4

Number of collisions: 0

Employee table after removing Mariam

Employee: Yara  
Age: 19  
Salary: 2000  
Years of experience: 0

Employee: Fatma  
Age: 21  
Salary: 3000  
Years of experience: 1

Employee: Ayman  
Age: 33  
Salary: 4000  
Years of experience: 8

Employee: Fawzy  
Age: 45  
Salary: 5000  
Years of experience: 8

Employee: Aya  
Age: 26  
Salary: 6000  
Years of experience: 3

Employee: Abdallah  
Age: 29  
Salary: 7000  
Years of experience: 4

Employee: Roshdy  
Age: 28  
Salary: 9000  
Years of experience: 3

Employee: Mina  
Age: 30  
Salary: 10000  
Years of experience: 4

- Note: For the linked list display, the employee object is completely implemented in the list; however, I chose to display them in a fashion that highlights a potential use case where they are organized by salary and the name of the employee is printed beside their salary. For the dynamic array, it made more sense to print all the details to show that the employee information is completely stored in the dynamic array.
- Both methods are effective depending on the intended use, however they have different strengths and weaknesses. For example, using the linked lists approach, one can simply print all the employees with the same salary, given that they are arranged in such a manner (Hash function sorting the employees by salary). Contrarily, in this instance where there are no collisions when using such a hash key method, it is a less complex method to simply store the employees in a dynamic array since there will be no need to link them together using one of the methods (Linear Probing / Separate Chaining), and thus will not require nodes or cursors to traverse the lists and is thus, more efficient.
- Given the scope of this assignment (the given employees), the most efficient hash function would be to use the employee salary and divide by 1000. By inspection, this results in the fewest collisions possible and logical index range, in this case 0 collisions, which is a key goal of the hash function.