

## Assignment 4

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Microsoft Visual Studio Debug Console

Using a dynamic array and linear probing:
Name: Fawzy, Age: 45, Salary: 5000, Experience: 8
Name: Yara, Age: 19, Salary: 2000, Experience: 0
Name: Roshdy, Age: 28, Salary: 9000, Experience: 3
Name: Mina, Age: 30, Salary: 10000, Experience: 4
Name: Abdallah, Age: 29, Salary: 7000, Experience: 4
Name: Mariam, Age: 32, Salary: 8000, Experience: 2
Name: Ayman, Age: 33, Salary: 4000, Experience: 8
Name: Fatma, Age: 21, Salary: 3000, Experience: 1
Name: Aya, Age: 26, Salary: 6000, Experience: 3
Collision rate: 4
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Using a linked list chaining approach
Name: Fawzy, Age: 45, Salary: 5000, Experience: 8
Name: Yara, Age: 19, Salary: 2000, Experience: 0
Name: Roshdy, Age: 28, Salary: 9000, Experience: 3
Name: Abdallah, Age: 29, Salary: 7000, Experience: 4
Name: Mina, Age: 30, Salary: 10000, Experience: 4
Name: Fatma, Age: 21, Salary: 3000, Experience: 1
Name: Mariam, Age: 32, Salary: 8000, Experience: 2
Name: Ayman, Age: 33, Salary: 4000, Experience: 8
Name: Aya, Age: 26, Salary: 6000, Experience: 3
Collision rate: 4
```

Q: Write which one do you think is better:

A: In my opinion, using chaining is much better as collision won't make you lose space like what happens during probing as you insert the element in the next free spot, while in chaining lots of elements could be connected to the same index or root node.

Q: Explain the hash function you chose and why you chose it.

A: for both linear probing and changing I used the function:

$h = \text{key} \bmod \text{size}$ , as I find it super easy to use and beneficial, but for the linear probing when a collision occurred  $h$  became  $h (h+1) \bmod \text{size}$ ;

Note: I didn't know to calculate collision rate, so I tried to understand from the web, and this is my reference:

- [https://iq.opengenus.org/probability-of-collision-in-hash/#:~:text=of%20hash%20values,-.If%20we%20hash%20M%20values%20and%20total%20possible%20hash%20values,\(M%2D1\)%20%2F%202T](https://iq.opengenus.org/probability-of-collision-in-hash/#:~:text=of%20hash%20values,-.If%20we%20hash%20M%20values%20and%20total%20possible%20hash%20values,(M%2D1)%20%2F%202T)