**CME 2201 - Assignment 1**

**DEVELOPING A SUPERMARKET MANAGEMENT SYSTEM**

**BY USING HASH TABLES**

**2021510122 Talha Mustafa Antep**

**2022510071 Mehmet Yörüdü**

Table of Performance Matrix

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Load Factor** | **Hash Function** | **Collision Handling** | **Collision Count** | **Indexing Time** | **Avg. Search Time** | **Min. Search Time** | **Max. Search Time** |
| α=50% | SSF | LP | 12412339682 | 235286.0 ms | 0.6370ms | 611.0ms | 654.0ms |
| DH | 70018961 | 1720.0ms | 0.7246ms | 667.0ms | 807.0ms |
| PAF | LP | 173821 | 597.0ms | 1.070ms | 1052.0ms | 1094.0ms |
| DH | 291602 | 666.0 ms | 1.128ms | 1075.0ms | 1164.0ms |
| α=80% | SSF | LP | 12145393697 | 180500.0 ms | 0.429.0 ms | 422.0ms | 435.0ms |
| DH | 71115554 | 2456.0ms | 0.471.0 ms | 469.0ms | 472.0ms |
| PAF | LP | 7622621 | 807.0ms | 0.547.0 ms | 543.0ms | 550.0ms |
| DH | 1734267 | 958.0ms | 0.753.0 ms | 738.0ms | 784.0ms |

Main Class:

It reads a file named "supermarket\_dataset\_50K.csv" that has information about supermarket customers. Users choose between two methods to handle data clashes: "Linear Probing" or "Double Hashing". Based on the chosen method, it stores customer information in a structured way using the selected approach to handle clashes. It counts how many times collisions happen and measures the time taken to organize the data. Users can search for specific keys of customers in the structured data. It displays the transactions of the key.

HashedDictionary Class:

This part creates a structure to store data in a dictionary-like format. It handles collisions that occur when multiple pieces of information share the same hash code in the structure. The choice between two methods of clash resolution is made while setting up this structure. It adds, removes, and finds information based on given keys in the structure. This part also keeps track of collisions, manages the amount of data in the structure, and ensures the data remains intact. It provides tools to check if specific keys exist and helps to move through the keys and their related information.

Customer Class:

This part is a helper class that represents a single customer's information. It contains details like name, date, and order.