# Hash Table Implementation

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This project provides a simple implementation of a hash table using linear probing in Python. The project is divided into two main files:

## Files

### hash\_table.py

This file contains the HashTableLinearProbing class, which represents the hash table. The class includes methods for initializing the hash table, saving and loading data from a JSON file, calculating hash values, inserting, searching, deleting, and displaying key-value pairs in the hash table.

#### Class Methods:

* \_\_init\_\_(self, size=0): Initializes the hash table with an optional size parameter.
* save\_to\_json(self, filename="hash\_table.json"): Saves the hash table data to a JSON file.
* load\_from\_json(self, filename="hash\_table.json"): Loads the hash table data from a JSON file.
* calc\_hash(self, key): Calculates the hash value for a given key.
* insert(self, key, value): Inserts a key-value pair into the hash table if the key does not exists and update if the ket exists.
* search(self, key): Searches for a key in the hash table and returns its associated value.
* delete(self, key): Deletes a key-value pair from the hash table.
* display(self): Displays the contents of the hash table.

### main.py

This file serves as the main entry point for the hash table application. It provides a simple command-line interface for interacting with the hash table.

#### Functions:

* get\_valid\_size(): Prompts the user to enter a valid size for the hash table.
* get\_valid\_key(): Prompts the user to enter a valid string key.
* display\_menu(): Displays the menu of available hash table operations.
* main(): Implements the main loop for user interaction, allowing the creation of a new hash table, loading and saving from/to JSON, and performing insert, search, delete, and display operations.

## Usage

To run the program, execute the main.py script. Follow the on-screen prompts to perform various operations on the hash table.

## Requirements

* Python 3.x

## How to Run

1. Clone the repository to your local machine.
2. Open a terminal and navigate to the project directory.
3. Run the command: python main.py
4. Follow the on-screen prompts to interact with the hash table.

# Image Gallery

### 

### create new hash table

### 

### delete from hash table

### 

### display hash table

### 

### insert into hash table (not a valid key)

### A computer screen shot of a blue background Description automatically generated

### insert into hash table (valid key)

### 

### invalid choice

### 

### json file not found

### A screen shot of a computer Description automatically generated

### load from json file

### 

### save to json file

### 

### search for a key

### 

### update value in hash table

