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EE432 PROJECT

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To-Do List Manager - Python Application

Introduction:

This is a simple To-Do List Manager application built using Python. It allows users to add, delete, search, and display tasks with priority levels. The application is implemented using essential data structures: **Linked List, Hash Table, and Binary Search Tree (BST)**. The graphical user interface (GUI) is built using **Tkinter**.

Features:

- **Add Tasks**: Users can add tasks with a description and priority level (High, Medium, Low).
- **Delete Tasks**: Users can remove tasks from the list.
- **Search Tasks**: Users can search for tasks by description.
- **Display Tasks**: All tasks are displayed in an organized manner.
- **Manage Tasks by Priority**: Tasks are stored and managed using a **Binary Search Tree (BST)** based on priority.

Installation & Setup:

Prerequisites:

Ensure you have Python installed on your system. You can check by running the following command:

```
python --version
```

If Python is not installed, download and install it from the Python Official Website.

Installing Required Libraries

The application uses **Tkinter**, which is included by default in Python. No additional libraries are needed.

Running the Application

1.Download the project files

Extract the `todo_list_project.zip` file.

2.Navigate to the project folder

```
cd path/to/todo_list_project
```

3.Run the application

```
python todo_app.py
```

How to Use:

1. Adding a Task:

- Enter the task description in the text field.
- Specify the priority level (`High`, `Medium`, `Low`).
- Click the **Add Task** button.
- The task will be added and stored using linked lists and hash tables.

2. Displaying All Tasks:

- Click the **Display Tasks** button.
- A list of tasks will be shown in the application interface.

3. Searching for a Task:

- Enter the task description in the search field.
- Click the **Search** button.
- A popup will show whether the task is found or not.

4. Deleting a Task:

- This feature is not implemented in the GUI yet but is planned for future versions.

File Structure:

```
📁 todo_list_project
|── task.py              # Task class definition
|── linked_list.py       # Linked List implementation
|── hash_table.py        # Hash Table implementation
|── bst.py               # Binary Search Tree implementation
|── todo_app.py          # Main GUI application
```

Future Improvements:

- Implement the delete functionality in the GUI.
- Enhance task sorting using different criteria.
- Store tasks persistently using a database or file.

Author:

Developed for the **EE432 Data Structures Assignment**.

License:

This project is free to use for educational purposes.

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Conclusion:

The To-Do List Manager application is a simple yet effective tool for managing tasks with varying priority levels. By utilizing fundamental data structures such as **Linked List**, **Hash Table**, and **Binary Search Tree (BST)**, the application demonstrates a practical implementation of these concepts in Python. The GUI built with **Tkinter** enhances the user experience, making task management straightforward and accessible.

While the current version supports basic functionalities like adding, displaying, and searching tasks, there is room for future enhancements, such as implementing task deletion, improving sorting criteria, and enabling persistent storage. This project serves as a valuable learning resource for understanding the integration of data structures with real-world applications.