OOP Tutorial: Command Line Task Manager

This tutorial guides you through creating a command-line task manager in Python, emphasizing object-oriented programming, JSON data storage, and command-line argument processing. You will design a system to manage tasks across multiple lists, implementing functionality to add, remove, and view tasks with considerations for data persistence and user interaction through the command line.

Introduction

You are tasked with developing a command-line task manager using Python. This project is designed to reinforce your understanding of:

- Object-oriented programming principles
- Persistent data storage with JSON
- Command line interface (CLI) utilities
- Basic file I/O operations

Operational Requirements

Your task manager should support multiple task lists, each with a unique name and the following capabilities:

1. Create a new task list
2. Delete an existing task list
3. Add tasks to a list with optional urgency
4. Remove tasks from a list by name or index
5. View all tasks in a list, sorted by urgency and numbered

Command Line Interface Specification

The program should accept the following command-line arguments:

- `taskm -new list_name`: Creates a new task list.
- `taskm -del list_name`: Deletes an existing task list.
- `taskm -add list_name "task description" [-u]`: Adds a task to the specified list. The `-u` flag is optional and indicates high urgency.
- `taskm -rm list_name task_identifier`: Removes a task by its description or index.
- `taskm list_name`: Displays all tasks in the specified list, sorted by urgency.

Data Storage Specification

Use JSON to save information to disk:

- Each task list should be stored in a separate JSON file named after the list.
- Tasks should be stored as JSON objects, including their description and urgency.

Expected Functionality

Object-Oriented Design

You should define at least two classes:

1. **TaskManager**: Manages individual task lists.
2. **TaskManagers**: Handles multiple `TaskManager` instances.

Do not hesitate to create your own exceptions.

Persistence Mechanism

Implement methods within these classes to:

- Load tasks from and save tasks to JSON files.
- Sort tasks by urgency within the task list whenever tasks are added or retrieved.