Technical Documentation

Task Manager Application

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Architecture Overview

The application follows a Client-Server Model using the MVC (Model-View-Controller) architecture:

- **Client (Front-End):** Built with WPF, providing a dynamic user interface. Users interact with the application through various UI components, allowing them to create, view, and manage tasks easily.
- **Server (Back-End):** Developed using the .NET Framework, handling business logic and data processing. It communicates with the client to perform operations based on user input.
- **Database:**
    - **File Storage:** Utilizes local file storage (e.g., JSON, XML, or plain text files) to save and retrieve task data, ensuring data persistence.
    - **Data Access Layer:** A layer that abstracts the file operations, handling reading from and writing to the data files, which ensures separation of concerns within the application architecture.
- **Deployment:** The application is designed as a desktop application, suitable for Windows environments, with considerations for future enhancements to support cloud-based storage.

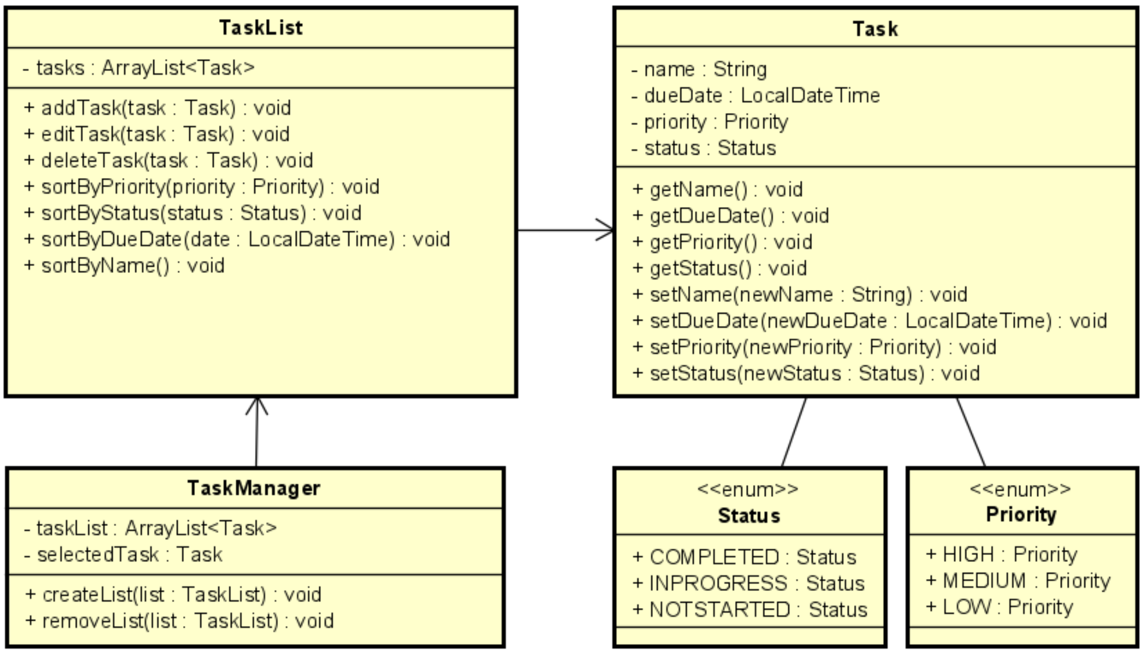
Diagrams

Unified Modeling Language (UML)

Class	Description	Methods
TaskManager	Contains a list of task lists (TaskList objects) and tracks the currently selected task. Acts as the "Controller" in an MVC architecture.	Methods for creating, removing, and updating task lists, along with methods for sorting and filtering tasks at the application level.
TaskList	Represents a list of tasks, containing a collection of Task objects.	Methods for adding, editing, removing tasks, and performing list-level operations like sorting, filtering, or searching tasks.
Task	Represents an individual task with attributes including name, description, due date, priority, and status.	Implements INotifyPropertyChanged to notify the UI when properties (such as status) are updated.
Priority	An Enum representing task priority levels (High, Medium, Low).	Used for prioritizing tasks for better management and display.
Status	An Enum representing task status (Completed, In Progress, Not Started).	Provides the foundation for task tracking and filtering.
TaskView	A UI component displaying details for a selected task.	Provides buttons and forms to edit, mark as completed, or delete tasks, communicating changes to TaskList.
ListView	Displays all tasks in a selected TaskList.	Allows users to sort, filter, or search tasks, updating based on the TaskList data source.

Class Relationships and Design Patterns

Name	Description
TaskManager	Follows the Singleton pattern to ensure a single point of control for task management across the application.
TaskList	Contains multiple Task objects, forming a one-to-many relationship.
Task	Implements the Observer pattern using events (e.g., INotifyPropertyChanged) to notify the UI when task properties change, ensuring real-time updates across relevant views.
TaskView and ListView	Bound to the user interface using data-binding principles; UI views are automatically updated whenever task attributes change.
Status and Priority	Used for filtering, sorting, and intuitively displaying tasks. They define business logic (e.g., only "In Progress" tasks are displayed by default on the home screen).

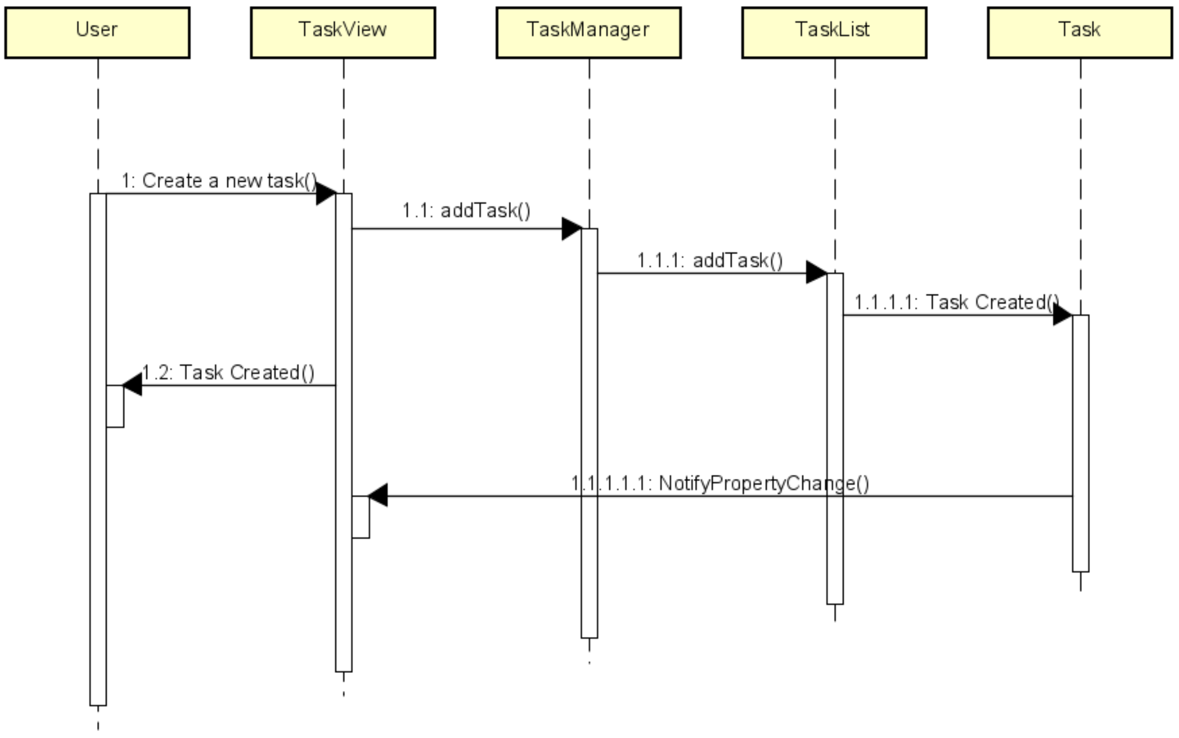

TaskList
- tasks : ArrayList<Task>
+ addTask(task : Task) : void
+ editTask(task : Task) : void
+ deleteTask(task : Task) : void
+ sortByPriority(priority : Priority) : void
+ sortByStatus(status : Status) : void
+ sortByDueDate(date : LocalDateTime) : void
+ sortByName() : void
Task
- name : String
- dueDate : LocalDateTime
- priority : Priority
- status : Status
+ getName() : void
+ getDueDate() : void
+ getPriority() : void
+ getStatus() : void
+ setName(newName : String) : void
+ setDueDate(newDueDate : LocalDateTime) : void
+ setPriority(newPriority : Priority) : void
+ setStatus(newStatus : Status) : void
TaskManager
- taskList : ArrayList<Task>
- selectedTask : Task
+ createList(list : TaskList) : void
+ removeList(list : TaskList) : void
<<enum>>
Status
+ COMPLETED : Status
+ INPROGRESS : Status
+ NOTSTARTED : Status
<<enum>>
Priority
+ HIGH : Priority
+ MEDIUM : Priority
+ LOW : Priority

Sequence Diagram

This section captures interactions between different components or objects within the system over time.

Task Creation

Outlines the steps for a user to create a task, involving appropriate methods for list and UI updates.

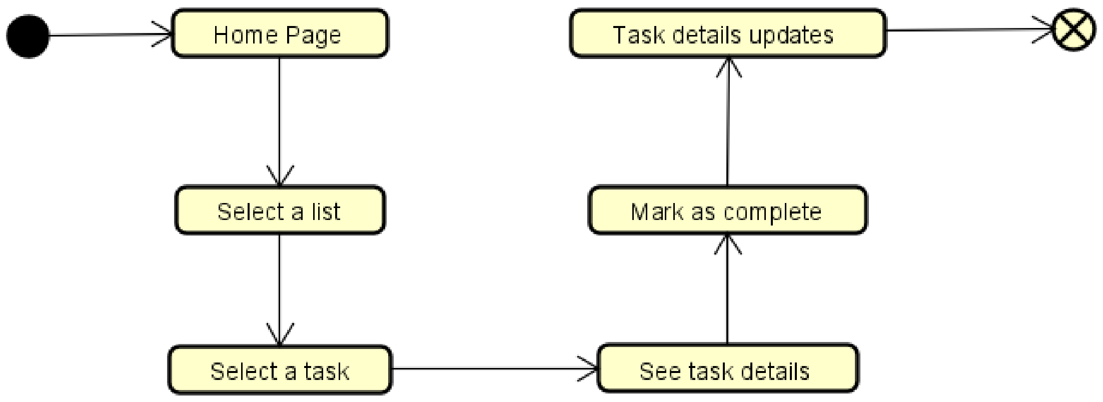


Activity Diagram

Displays the workflow of tasks and operations within the system.

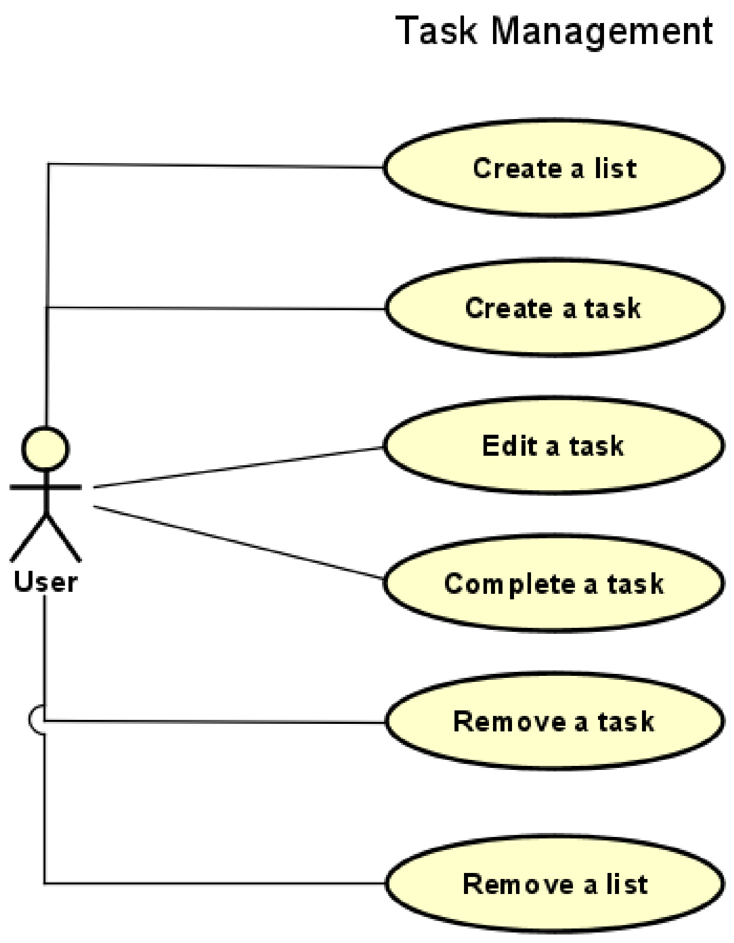
Task Completion

Illustrates the workflow for completing a task within the app.



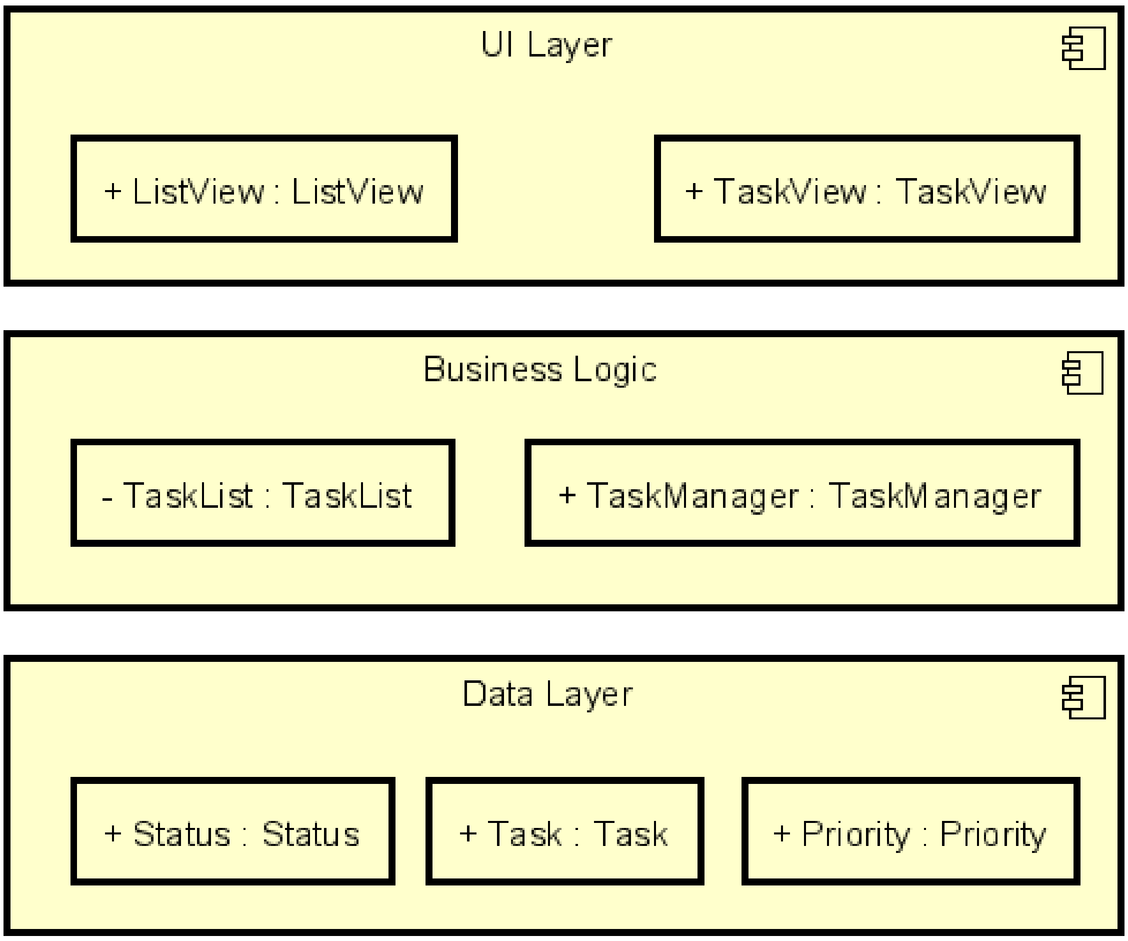
Use Case

Represents the various actions users can perform within the application.



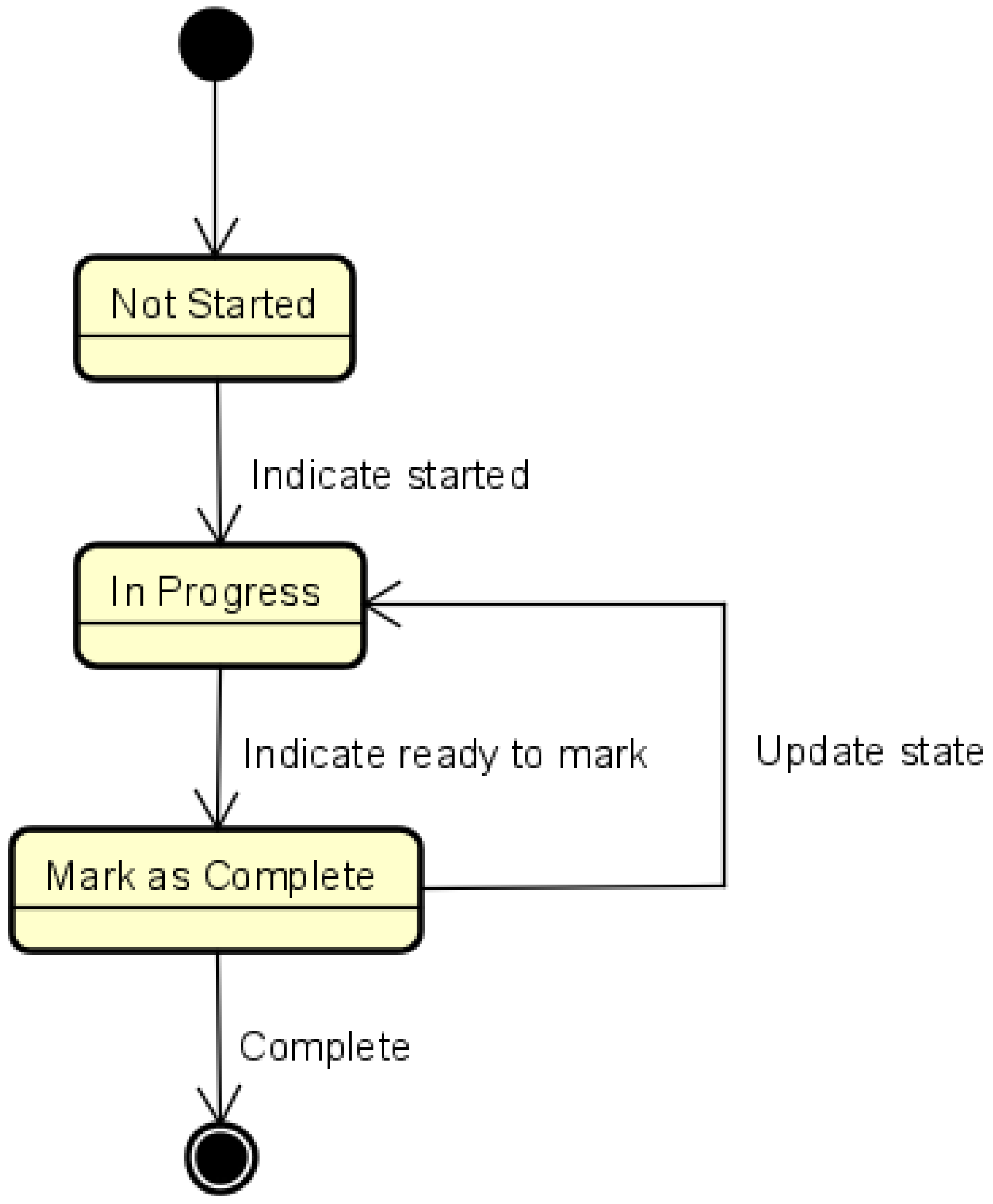
Component Diagram

Highlights the high-level architecture of the application, showing the various components that constitute the system.



State Diagram

Shows the process of a task and how its state can change.


Not Started
Indicate started
In Progress
Indicate ready to mark
Update state
Mark as Complete
Complete