TASK MANAGER API

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INTRODUCTION

Purpose

The **Task Manager API** is a backend service designed to allow clients to Create, Read, Update, and Delete (CRUD) task records. Its purpose is to provide a reliable and structured interface for task management that can be integrated with web or mobile applications.

Intended Audience and Use

- Audience: Developers, testers, and technical reviewers who will use or integrate the API.
- Use: Clients will interact with the API using HTTP requests to perform CRUD operations on tasks.

Product Scope

- **Included:**
  - CRUD operations on tasks (title, description, status, due_date)
  - Data persistence in SQL database (PostgreSQL/MySQL)
  - Optional user authentication
- **Excluded:**
  - Frontend UI
  - Notifications or scheduling beyond basic due dates
  - Project-level task grouping beyond single tasks

Definitions, Acronyms, Abbreviations

- API: Application Programming Interface
- CRUD: Create, Read, Update, Delete
- REST: Representational State Transfer
- DB: Database

1.5 References

- Node.js v20+
- PostgreSQL / MySQL
- GitHub repository for version control

OVERALL DESCRIPTION

Product Perspective

This API is a standalone backend service intended to serve frontend applications or other services requiring task management functionality.

Product Functions

- Create a new task
- Retrieve all tasks or a single task by ID
- Update a task's details
- Delete a task
- Optional: user registration and authentication

User Classes and Characteristics

This section describes user types interacting with the system. The design class structure is detailed in the design artifacts section.

- API Client / Developer: Integrates API with applications; uses JSON for requests and responses.
- Registered User (if auth implemented): Can perform CRUD operations only on their own tasks.

Operating Environment / Dependencies / Constraints

- Node.js runtime
- SQL database available (PostgreSQL/MySQL)
- Internet access for GitHub / optional deployment

Assumptions and Dependencies

- Database is operational and accessible
- Clients send valid JSON requests
- No high-load or enterprise-scale performance is required

SYSTEM FEATURES AND REQUIREMENTS

Functional Requirements

ID	REQUIREMENT	DESCRIPTION
FR-001	Create Task	`POST /tasks` with required "`title`" creates a new task; returns **201 Created** with task JSON including ID.
FR-001-E	Create Task - Invalid	Missing "`title`" > **400 Bad Request** with error message.
FR-002	Read All Tasks	`GET /tasks` returns **200 OK** with JSON array of all tasks.
FR-003	Read Single Task	`GET /tasks/{id}` returns **200 OK** with task JSON; invalid ID > **404 Not Found**.
FR-004	Update Task	`PUT /tasks/{id}` updates fields; returns **200 OK** with updated JSON. Invalid ID > **404**, invalid input > **400**.
FR-005	Delete Task	`DELETE /tasks/{id}` deletes task; returns **204 No Content**. Invalid ID > **404**.
FR-006	Authentication/Authorization	CRUD operations require valid token; invalid/missing > **401 Unauthorized**.

External Interface Requirements

- API Endpoints: /tasks, /tasks/:id with standard HTTP methods (GET, POST, PUT, DELETE)
- Database: PostgreSQL/MySQL; schema defined in **Appendix A**
- Configuration: Environment variables for database connection, optional auth secret

Non-Functional Requirements

- **Performance:** Average response under 200ms
- **Reliability/Data Integrity:** Tasks must be persistently stored; no data loss under normal operation
- **Security:** Inputs sanitized; auth required if implemented
- **Maintainability:** Modular, documented code; version-controlled via GitHub
- **Scalability:** Database/server can be upgraded if usage grows

Other Requirements / Supplemental Sections

Database Requirements

- SQL relational database
- Tables: Tasks (id, title, description, status, due_date, user_id if auth implemented), Users (id, username, password hash, etc.)

Development Tools / Environment Constraints

- Node.js v24+
- Git/GitHub for version control
- Postman or similar for testing endpoints

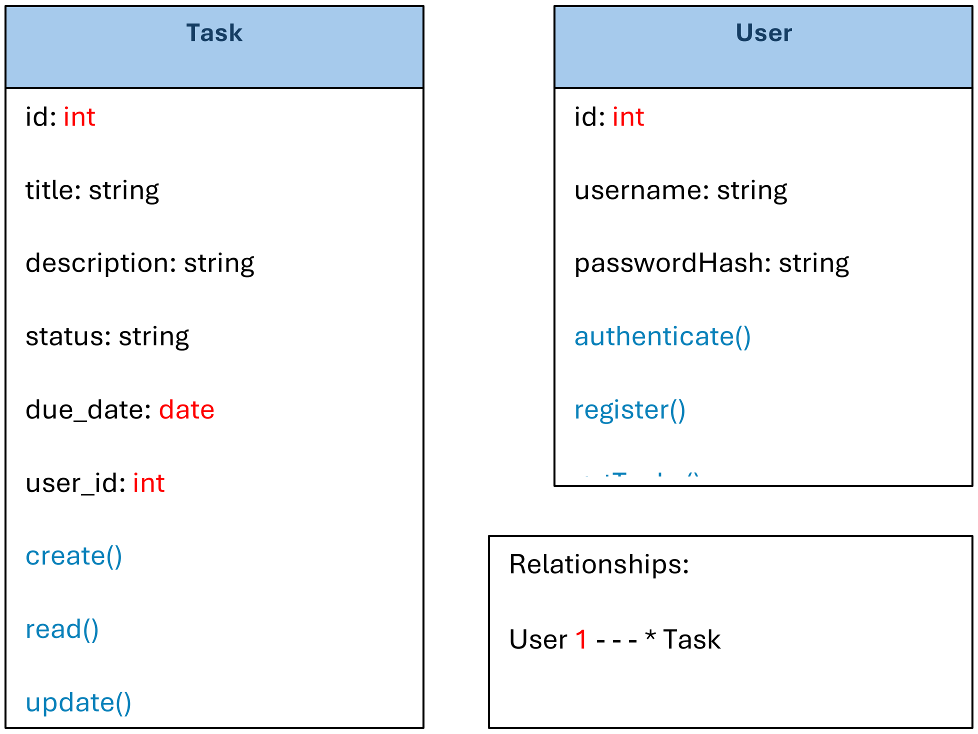
Limitations / Known Issues / Future Extensions

- No frontend UI
- No advanced task filtering or pagination
- Future: add notifications, project grouping, and user roles

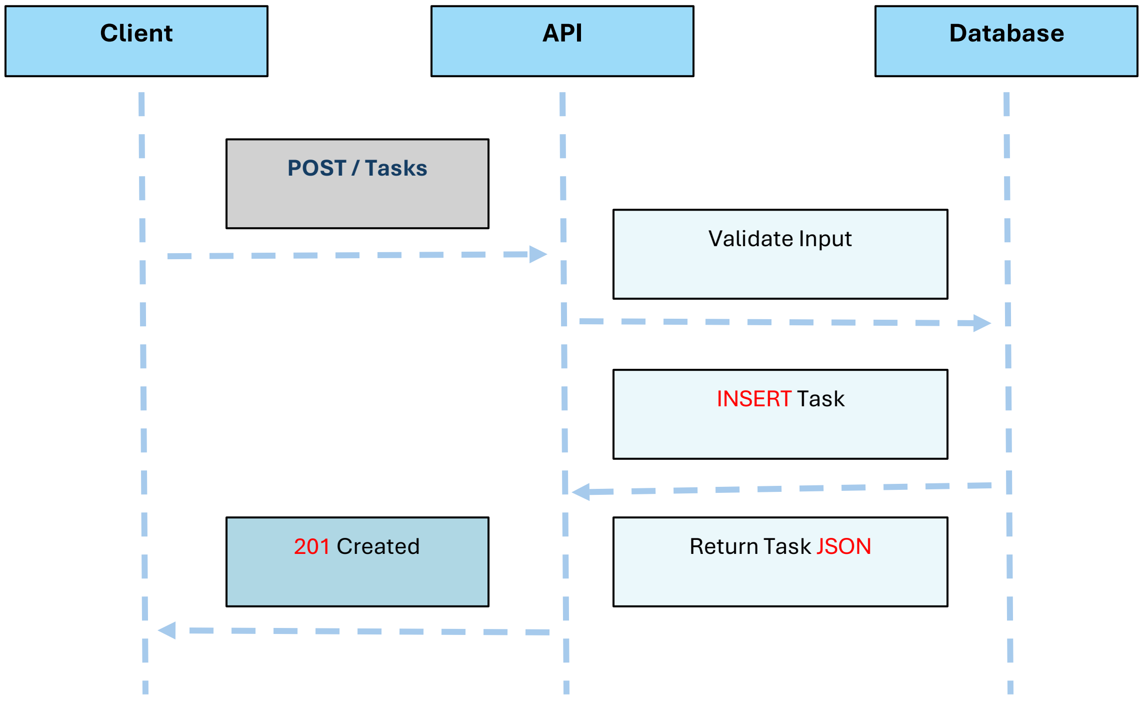
Appendices

Design Diagrams

Class Diagram:



Sequence Diagram:



Revision History

Version	Date	Author	Description
1.0	11-26-2025	Keves	Initial draft.