***Database Flow Description for User and Task Models***

***Overview:***

This dissertation outlines the database schema and flow for a system managing users and their associated tasks. The models are defined using Mongoose, an Object Data Modeling (ODM) library for MongoDB and Node.js. The database schema is divided into two primary models: “User” and “Task”. Each model has various fields and relationships to efficiently manage the data.

***1. User Model:***

The “User” model defines the schema for user information and authentication details. It includes fields for user identification, authentication methods, task assignments, and additional user-specific data.

***Key Features:***

* Basic Information: Includes “username”, “email”, “phonenumber”.
* Authentication: Fields such as “password” and “authMethod”.
* Admin Status: “isAdmin” field to differentiate between regular users and administrators.
* Task Association: “tasks” field references “Task” model.
* Profile Management: “profileImage” for storing profile image paths.
* Password Reset: “resetPasswordToken” and “resetPasswordExpires” for managing password reset functionality.
* Soft Deletion: “isdelete” field to mark users as deleted without removing them from the database.

***2. Task Model:***

The “Task” model outlines the schema for tasks assigned to users, including task details, priority, assignees, comments, and other task-specific information.

***Key Features:***

* Task Details: Includes “title”, “description”, and “dueDateTime”.
* Priority: “priority” field with enum values ['Low', 'Medium', 'High'].
* Creator and Assignees: “createdBy” references the “User” model, and “assignees” is an array of user references with roles.
* Categories and Comments: Allows categorization and user comments on tasks.
* Task Management: Fields like “completed” and “isDeleted” for managing task states.
* Schema Refinements: Validation for “dueDateTime”, indexes for performance, virtuals, and schema methods for additional functionality.

***Database Flow:***

**1. User Creation:**

* When a new user registers, a “User” document is created with the provided details.
* The “password” field is optional to support different authentication methods (e.g., OAuth).

**2. Task Assignment:**

* A new “Task” can be created by a user (identified by “createdBy”).
* The “Task” document references the “User” document through the “createdBy” field and the “assignees” array.

**3. Task Management:**

* Tasks have fields to track their status (“completed”, “isDeleted”), priority, and due date (“dueDateTime”).
* Users can comment on tasks, with comments tracked by user reference and timestamp.

**4. Password Reset:**

* Users requesting a password reset will have “resetPasswordToken” and “resetPasswordExpires” fields updated.

**5. Profile Management:**

* Users can update their profile image stored in the “profileImage” field.

**6. Soft Deletion:**

* Instead of removing documents from the database, the “isdelete” (for users) and “isDeleted” (for tasks) fields are used to mark them as deleted.

**7. Indexes and Virtuals:**

* Indexes: Indexing “dueDateTime” and “priority” in the “Task” model improves query performance for these fields.
* Virtuals: “isOverdue” virtual in the “Task” model calculates if a task is overdue.