PCBM - PC Build Manager

A web application that allows users to browse available PC parts, configure simple PC builds, and manage component inventory. This project includes backend services for data storage and a frontend interface to interact with the data.
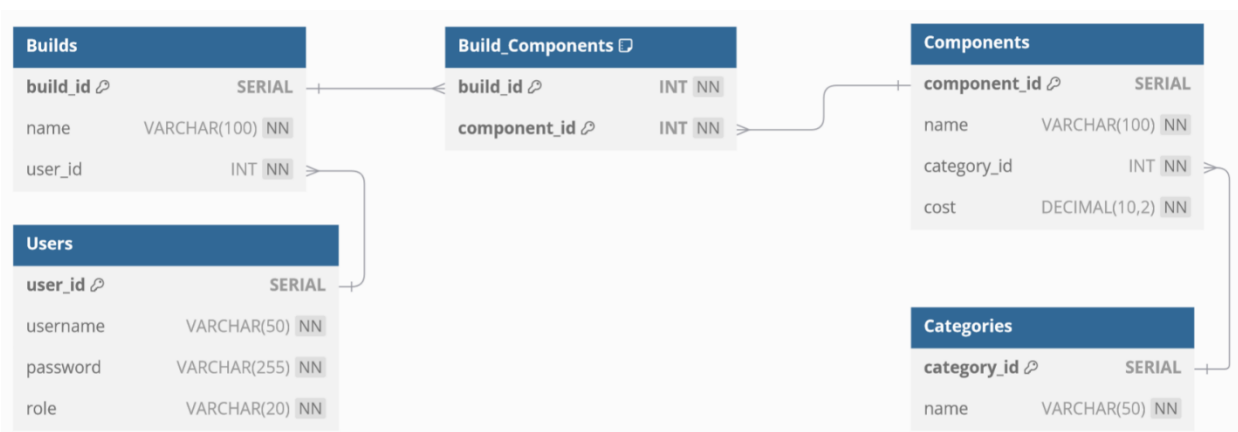
Project Overview

The **PCBM** app will allow users to:

1. View available PC components (e.g., CPUs, GPUs, RAM).

2. Create and save simple PC builds by selecting from available components.

3. Administer component inventory, such as adding or removing parts.

4. Secure access with role-based permissions, allowing users to create/view builds and admins to manage components.

Functional Requirements

Backend

1. Database Structure:

    o Tables:

        ▪ **Components**: Stores details like id, name, type, cost.

        ▪ **Builds**: Records builds created by users with selected components.

        ▪ **Users**: Manages user accounts, authentication, and roles.

        ▪ **Categories**: Organizes components into categories like "CPU," "GPU," etc.

    o Relationships:

        ▪ Each build references multiple components and an owner (user).

        ▪ Components are assigned a category.

2. API Endpoints:

   o **CRUD for Components** (GET, POST, PUT, DELETE).

   o **CRUD for Builds** (GET, POST, PUT, DELETE).

   o A **PDF export endpoint** for users to download a summary of their build.

   o A **pagination endpoint** to list components with filtering options.

3. Security:

   o Roles:

      ▪ **Admin**: Full access to managing components.

      ▪ **User**: Limited access to create and view builds.

   o Restrict endpoints based on these roles.

4. Testing:

   o Include 3 test cases to validate key functionality

      ▪ **Creating a build**

      ▪ **Managing components**
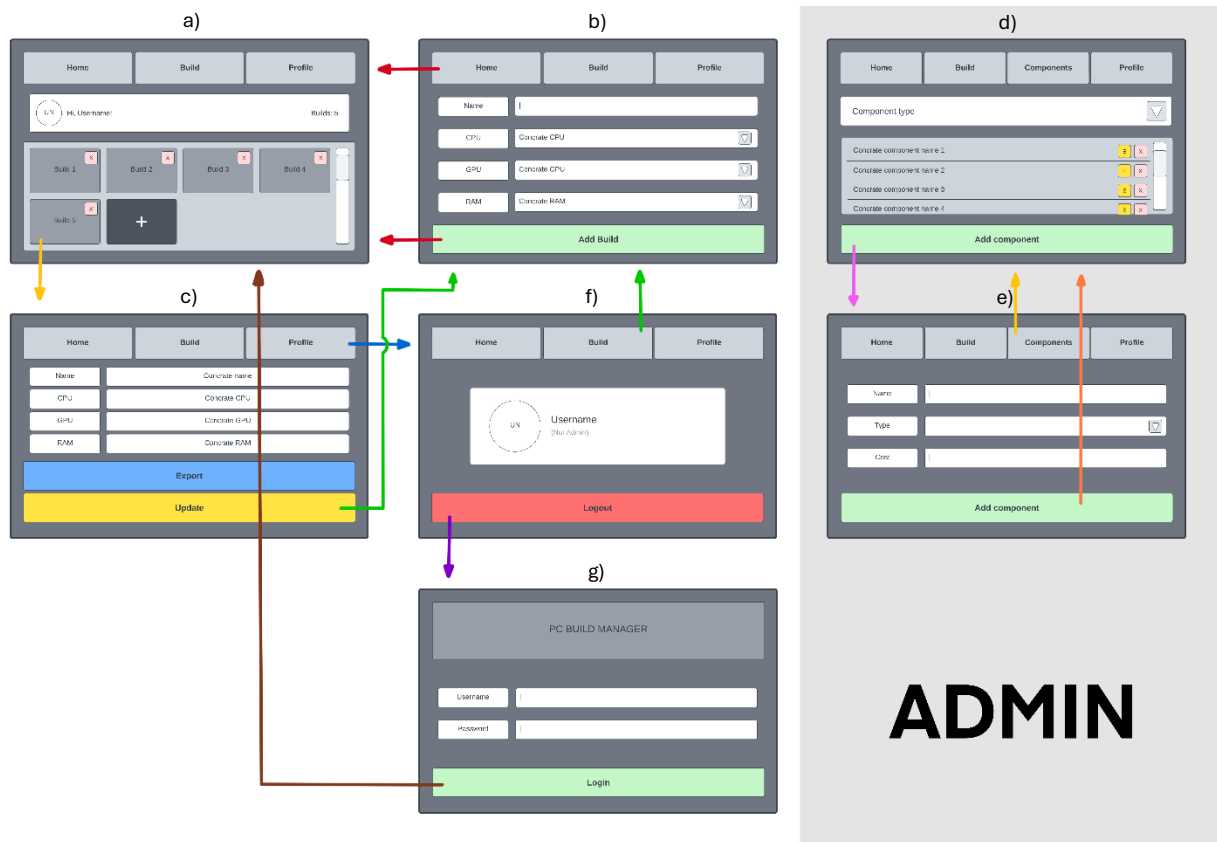
      ▪ **Access control**

5. Documentation:

   o Provide **README** for project setup.

   o **Swagger/OpenAPI** for documenting the API.

   o **UML diagram** for the data model, showing relationships between tables.

   o **Postman collection** to test the endpoints

Frontend

1. Views and Components:

   a) **Home**: Shows the user's all builds.

   b) **Build Creator**: Allows users to assemble a PC build.

   c) **Build Summary**: Displays details of a saved build, and option to export.

   d) **Admin Panel**: List the components.

   e) **Component Creator**: Enables admins to create/update components.

   f) **Profile info**: Show some info about the current user.

   g) **Login page**: User can login

2. Navigation Flow:

- **Login Page (g)**:
  - **Login**: When the user successfully logs in, they are redirected to the **Home** page (a).

- **Home Page (a)**:
  - **Build Card**: Clicking on a build card takes the user to the **Build Summary** page (c).
  - **Build (and "+" sign)**: Clicking the "Build" button in the top menu (or the build card with a "+" sign) navigates the user to the **Build Creator** page (b).
  - **Profile**: Clicking the "Profile" button in the top menu navigates to the **Profile Info** page (f).
  - **Components (Admin Only)**: If the user is an admin, clicking the "Components" button in the top menu navigates to the **Admin Panel** (d).

- **Build Creator Page (b)**:
  - **Add Build**: Clicking "Add Build" saves the new build and redirects the user back to the **Home** page (a).
  - **Home / Components / Profile**: The top menu options allow users to navigate to **Home** (a), **Components** (d) or **Profile** (f) from here.

- o **Build Summary Page (c)**:
  - ▪ **Update**: Clicking the "Update" button navigates to the **Build Creator** page (b) for editing.
  - ▪ **Export**: Allows the user to export the build in PDF format (doesn't navigate to a new page).
  - ▪ **Home / Build / Components / Profile**: The top menu options allow users to navigate to **Home** (a), **Build** (b), **Components** (d) or **Profile** (f) pages.
- o **Admin Panel (d)** (Admin Only):
  - ▪ **Add Component**: Clicking "Add Component" navigates to the **Component Creator** page (e).
  - ▪ **Home / Build / Profile**: The top menu options allow admins to navigate to **Home** (a), **Build** (b) or **Profile** (f) pages.
- o **Component Creator Page (e)** (Admin Only):
  - ▪ **Add Component**: After saving a component, the admin is redirected back to the **Admin Panel** (d).
  - ▪ **Home / Build / Components / Profile**: The top menu options allow admins to navigate to **Home** (a), **Build** (b), **Components** (d) or **Profile** (f) pages.
- o **Profile Info Page (f)**:
  - ▪ **Logout**: Clicking the "Logout" button logs the user out and redirects them to the **Login Page** (g).
  - ▪ **Home / Build / Components**: The top menu options allow users to navigate back to the **Home** (a), **Build** (b) or **Components** (d) pages.