**Database Design Schema Document: School Equipment Lending Portal**

**1. Schema Overview**

**The database utilizes five primary tables to manage user roles, equipment inventory, lending transactions, and maintenance logs.**

| **Table Name** | **Description** | **Primary Key (PK)** | **Foreign Keys (FK)** |
| --- | --- | --- | --- |
| **USERS** | **Stores authentication and role information for students, staff, and admins.** | **user\_id** | **N/A** |
| **EQUIPMENT\_CATEGORY** | **Defines groups for equipment (e.g., Cameras, Sports Kits).** | **category\_id** | **N/A** |
| **EQUIPMENT** | **Manages inventory details and total/available stock of each equipment type.** | **equipment\_id** | **category\_id** |
| **LENDING\_REQUESTS** | **Tracks all borrowing requests, approvals, issues, returns, and due dates.** | **request\_id** | **equipment\_id, requester\_id, approver\_id** |
| **REPAIR\_LOG** | **Records details of reported damage, maintenance costs, and repair status.** | **log\_id** | **equipment\_id, reported\_by\_user\_id** |

**2. Table and Column Definitions**

**Table 1: USERS (User Authentication and Roles)**

| **Column Name** | **Data Type** | **Key/Constraint** | **Description** |
| --- | --- | --- | --- |
| **user\_id** | **INT** | **PK, AUTO\_INCREMENT** | **Unique identifier for the user.** |
| **username** | **VARCHAR(100)** | **NOT NULL, UNIQUE** | **User login name (e.g., student ID).** |
| **password\_hash** | **VARCHAR(255)** | **NOT NULL** | **Secured, hashed password.** |
| **full\_name** | **VARCHAR(255)** | **NOT NULL** | **Full name of the user.** |
| **role** | **ENUM('Student', 'Staff', 'Admin')** | **NOT NULL** | **Defines access level and permissions.** |
| **email** | **VARCHAR(150)** | **NOT NULL, UNIQUE** | **Contact email (used for overdue notifications).** |
| **phone\_number** | **VARCHAR(15)** |  | **Optional contact number.** |

**Table 2: EQUIPMENT\_CATEGORY (Categorization)**

| **Column Name** | **Data Type** | **Key/Constraint** | **Description** |
| --- | --- | --- | --- |
| **category\_id** | **INT** | **PK, AUTO\_INCREMENT** | **Unique identifier for the category.** |
| **category\_name** | **VARCHAR(100)** | **NOT NULL, UNIQUE** | **Name of the equipment category.** |
| **description** | **TEXT** |  | **Detailed description of items in this group.** |

**Table 3: EQUIPMENT (Inventory Management)**

| **Column Name** | **Data Type** | **Key/Constraint** | **Description** |
| --- | --- | --- | --- |
| **equipment\_id** | **INT** | **PK, AUTO\_INCREMENT** | **Unique ID for the equipment type/model.** |
| **name** | **VARCHAR(255)** | **NOT NULL** | **Equipment name (e.g., 'Nikon D3500').** |
| **category\_id** | **INT** | **FK (EQUIPMENT\_CATEGORY)** | **Links to the category it belongs to.** |
| **total\_quantity** | **INT** | **NOT NULL, DEFAULT 0** | **Total units the school owns.** |
| **available\_quantity** | **INT** | **NOT NULL, DEFAULT 0** | **Units currently available for lending (calculated as Total - Issued).** |

**Table 4: LENDING\_REQUESTS (Lending and Due Date Tracking)**

| **Column Name** | **Data Type** | **Key/Constraint** | **Description** |
| --- | --- | --- | --- |
| **request\_id** | **INT** | **PK, AUTO\_INCREMENT** | **Unique identifier for the request/loan.** |
| **equipment\_id** | **INT** | **FK (EQUIPMENT)** | **The equipment type being requested.** |
| **requester\_id** | **INT** | **FK (USERS)** | **The user who made the request.** |
| **request\_date** | **DATETIME** | **NOT NULL** | **Timestamp when the request was submitted.** |
| **borrow\_date** | **DATE** |  | **Date the item was issued.** |
| **expected\_return\_date** | **DATE** | **NOT NULL** | **Critical for Due Date Tracking.** |
| **return\_date** | **DATE** |  | **Actual return date (used for usage analytics).** |
| **quantity** | **INT** | **NOT NULL** | **Number of units borrowed.** |
| **status** | **ENUM('Pending', 'Approved', 'Issued', 'Rejected', 'Returned')** | **NOT NULL** | **Current status of the request.** |
| **approver\_id** | **INT** | **FK (USERS)** | **The Admin/Staff who approved the request.** |
| **rejection\_reason** | **TEXT** |  | **Reason if the request was rejected.** |

**Table 5: REPAIR\_LOG (Damage and Maintenance Log)**

| **Column Name** | **Data Type** | **Key/Constraint** | **Description** |
| --- | --- | --- | --- |
| **log\_id** | **INT** | **PK, AUTO\_INCREMENT** | **Unique identifier for the repair event.** |
| **equipment\_id** | **INT** | **FK (EQUIPMENT)** | **The equipment type being repaired.** |
| **damage\_description** | **TEXT** | **NOT NULL** | **Details of the damage reported.** |
| **reported\_by\_user\_id** | **INT** | **FK (USERS)** | **The user who reported the damage.** |
| **report\_date** | **DATE** | **NOT NULL** | **Date the damage was recorded.** |
| **repair\_cost** | **DECIMAL(10, 2)** |  | **Financial cost of the repair.** |
| **repair\_date** | **DATE** |  | **Date the item was fixed and returned to service.** |
| **repaired\_by** | **VARCHAR(100)** |  | **Name of the vendor or technician.** |

**3. SQL Data Definition Language (DDL)**

**-- 1. CREATE DATABASE**

**CREATE DATABASE IF NOT EXISTS school\_lending\_portal;**

**USE school\_lending\_portal;**

**-- 2. CREATE TABLES**

**-- Table 1: USERS**

**CREATE TABLE USERS (**

**user\_id INT AUTO\_INCREMENT PRIMARY KEY,**

**username VARCHAR(100) NOT NULL UNIQUE,**

**password\_hash VARCHAR(255) NOT NULL,**

**full\_name VARCHAR(255) NOT NULL,**

**role ENUM('Student', 'Staff', 'Admin') NOT NULL,**

**email VARCHAR(150) NOT NULL UNIQUE,**

**phone\_number VARCHAR(15)**

**);**

**-- Table 2: EQUIPMENT\_CATEGORY**

**CREATE TABLE EQUIPMENT\_CATEGORY (**

**category\_id INT AUTO\_INCREMENT PRIMARY KEY,**

**category\_name VARCHAR(100) NOT NULL UNIQUE,**

**description TEXT**

**);**

**-- Table 3: EQUIPMENT**

**CREATE TABLE EQUIPMENT (**

**equipment\_id INT AUTO\_INCREMENT PRIMARY KEY,**

**name VARCHAR(255) NOT NULL,**

**category\_id INT NOT NULL,**

**total\_quantity INT NOT NULL DEFAULT 0,**

**available\_quantity INT NOT NULL DEFAULT 0,**

**FOREIGN KEY (category\_id) REFERENCES EQUIPMENT\_CATEGORY(category\_id)**

**);**

**-- Table 4: LENDING\_REQUESTS**

**CREATE TABLE LENDING\_REQUESTS (**

**request\_id INT AUTO\_INCREMENT PRIMARY KEY,**

**equipment\_id INT NOT NULL,**

**requester\_id INT NOT NULL,**

**request\_date DATETIME NOT NULL,**

**borrow\_date DATE,**

**expected\_return\_date DATE NOT NULL,**

**return\_date DATE,**

**quantity INT NOT NULL,**

**status ENUM('Pending', 'Approved', 'Issued', 'Rejected', 'Returned') NOT NULL,**

**approver\_id INT,**

**rejection\_reason TEXT,**

**FOREIGN KEY (equipment\_id) REFERENCES EQUIPMENT(equipment\_id),**

**FOREIGN KEY (requester\_id) REFERENCES USERS(user\_id),**

**FOREIGN KEY (approver\_id) REFERENCES USERS(user\_id)**

**);**

**-- Table 5: REPAIR\_LOG**

**CREATE TABLE REPAIR\_LOG (**

**log\_id INT AUTO\_INCREMENT PRIMARY KEY,**

**equipment\_id INT NOT NULL,**

**damage\_description TEXT NOT NULL,**

**reported\_by\_user\_id INT,**

**report\_date DATE NOT NULL,**

**repair\_cost DECIMAL(10, 2),**

**repair\_date DATE,**

**repaired\_by VARCHAR(100),**

**FOREIGN KEY (equipment\_id) REFERENCES EQUIPMENT(equipment\_id),**

**FOREIGN KEY (reported\_by\_user\_id) REFERENCES USERS(user\_id)**

**);**