**Student Name: Varinder Singh**

**Student ID: Varinder.Singh@city.ac.uk**

**Student Number: 240003978**

**Scenario Title:**

Laptop Rental System for University Campuses

**Scenario:**

At university a laptop rental system is used to track the rentals ,making the process of rental transaction easier for the staff to manage. Users can rent laptops for specific periods, and the system tracks availability, rental history, and maintenance logs to ensure efficiency and accessibility. The system will store userID ,name and numberofRentals for user, User could be admin or regular user. The laptops will have a laptopID . The laptops model and status will be recorded. When a laptop is rented the transactionID , userID, laptopID, rental date and return date will be recorded. If laptop is lost a report is created.

**Example Entities and Attributes:**

* **User**:
  + UserID (Primary Key)
  + Attributes:  Name, numberOfrentals.
* **Admin:**
* UserID (primary key / foreign key)
* rights
* **Regular user**:
* UserID (Primary Key / foreign key)
* Attributes:  preferences ,last login
* **Laptop**:
  + LaptopID (Primary Key)
  + Attributes: Model, Status (Available/Rented/Maintenance).
* **Report**:
  + ReportID (Primary Key), LaptopID (Foreign Key), UserID (Foreign Key)
  + Attributes: Report Date, Description, fine.
* **Rental Transaction (Event)**:
* TransactionID (Primary Key)
  + Attributes:  UserID (Foreign Key), LaptopID (Foreign Key), rentalDate,

returnDate .

* **Maintenance Log:**
* logID (Primary Key)
* Attributes: laptopID(Foreign Key), serviceDate, serviceDescription, technicianEmail

**Example Queries:**

1. List all the reports filed for lost laptop.
2. Who has rented a specific laptop most times?
3. Which laptops are currently under maintenance?
4. How many laptops are currently under maintenance?
5. Fewest number of rentals by a user.
6. List all laptops that were rented but never returned.
7. How many laptops had battery replacements when they were in maintenance?

**A diagram of a computer

Description automatically generatedEntity Relationship Model:**

**Relational Model Tables:**

|  |  |
| --- | --- |
| **Relational table specification** | **Marker’s corrections (Do not write in this column)** |
| **Table name:** USER |  |
| **Attributes** |  |
| userID |  |
| Name |  |
| numberOfrentals |  |
| **PRIMARY KEY** (userID) |  |

|  |  |
| --- | --- |
| **Relational table specification** | **Marker’s corrections (Do not write in this column)** |
| **Table name:** Admin |  |
| **Attributes** |  |
| userID |  |
| adminRights |  |
| **PRIMARY KEY** (userID) |  |
| **FOREIGN KEY** (userID) REFERENCES USER (userID) |  |
| **Relational table specification** | **Marker’s corrections (Do not write in this column)** |
| **Table name:** RegularUser |  |
| **Attributes** |  |
| userID |  |
| preferences |  |
| **PRIMARY KEY** (userID) |  |
| **FOREIGN KEY** (userID) REFERENCES USER (userID) |  |
| **Relational table specification** | **Marker’s corrections (Do not write in this column)** |
| **Table name:** LAPTOP |  |
| **Attributes** |  |
| laptopID |  |
| model |  |
| status |  |
| **PRIMARY KEY** (laptopID) |  |

|  |  |
| --- | --- |
| **Relational table specification** | **Marker’s corrections (Do not write in this column)** |
| **Table name:** REPORT |  |
| **Attributes** |  |
| reportID |  |
| laptopID |  |
| userID |  |
| reportDate |  |
| description |  |
| fine |  |
| **PRIMARY KEY** (reportID) |  |
| **FOREIGN KEY** (laptopID) REFERENCES LAPTOP (laptopID) |  |
| **FOREIGN KEY** (userID) REFERENCES USER (userID) |  |
| **Relational table specification** | **Marker’s corrections (Do not write in this column)** |
| **Table name:** RENTAL TRANSACTION |  |
| **Attributes** |  |
| transctionID |  |
| laptopID |  |
| userID |  |
| rentalDate |  |
| returnDate |  |
| **PRIMARY KEY** (transactionID) |  |
| **FOREIGN KEY** (laptopID) REFERENCES LAPTOP (laptopID) |  |
| **FOREIGN KEY** (userID) REFERENCES USER (userID) |  |

|  |  |
| --- | --- |
| **Relational table specification** | **Marker’s corrections (Do not write in this column)** |
| **Table name:** MaintenanceLog |  |
| **Attributes** |  |
| logID |  |
| laptopID |  |
| serviceDate |  |
| serviceDescription |  |
| technicianEmail |  |
| **PRIMARY KEY** (logID) |  |
| **FOREIGN KEY** (laptopID) REFERENCES LAPTOP (laptopID) |  |