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Course Section Number: CSCI-GA.2433-001

**Project Part 1**

Total in points (100 points total): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Professor’s Comments:

Affirmation of my Independent Effort: Bing Xue

(Sign here)

Topic: Bookstore Management System

Background:

A bookstore needs a book management system to unify the management of book purchases, sales, and finance.

Cases:

1. User Management

1) System users are divided into super administrator users and ordinary administrator users. Ordinary administrator users can only manage the information of book purchases and sales, and can only query and modify their own user information; while the super administrator can not only manage the information of book purchases and sales but also create new users and view the information of all users.

2) Super administrator users already exist when the system is completed (i.e., their usernames and passwords already exist in the database). The username and password for the normal administrator user need to be created by the super administrator user.

3) The user's password cannot be saved in plaintext in the database but must be encrypted first, usually using the MD5 algorithm.

4) In addition to the username and password, each user also has their real name, work number, gender, age, and other basic information.

5) All functions of the system can be operated only when the user is logged in.

2. Book Inventory Management

The system needs to maintain the information of all books currently in stock in the whole bookstore, including ISBN number, book name, publisher, author, retail price, current stock quantity, etc.

3. Book Search

You can use book number, book ISBN number, book title, author, publisher, etc. to query the books in stock.

4. Book Information Modification

You can modify the book name, author, publisher, retail price, and other information.

5. Book stocking:

For books that need to be stocked, if the book has been in the inventory before, the book ID will be included in the inventory list directly, otherwise, you need to enter the information about the book in stock, including ISBN number, title, author, and publisher.

Otherwise, you need to enter the information about the book in stock, including ISBN number, title, author, publisher, etc. In addition, each book should be specified with its purchase price and quantity. For books that have just been added to the purchase list, they are given the status of unpaid.

6. Payment for incoming purchases:

Check the books that are in stock and give the payment, the status of the book after payment is

After payment, the status of the book will be "Paid".

7. Book Return:

You can return books that have not been paid for, i.e. the status of the books will be changed to Returned.

8. Add a new book:

For books that have been paid for, you can add them to the inventory when they arrive, and then you need to add the retail price of the book.

9. Book Purchase:

To purchase a book using the marked retail price, the number of books in stock needs to be

The number of books in stock needs to be reduced accordingly.

10. Financial Management:

When a payment is made for a book purchase, or when a book is purchased, a billing record is added to the system's financial account to record the expenses or receipts to the financial account.

11. View Billing

View the income or expense records of the financial account for a certain period of time.

Report on Project Part 1

Team Member:

Bing Xue (bx2109)

Recap on E-R diagram:

An Entity Relationship (ER) Diagram is a type of flowchart that illustrates how “entities” such as people, objects, or concepts relate to each other within a system. ER Diagrams are most often used to design or debug relational databases in the fields of software engineering, business information systems, education, and research. Also known as ERDs or ER Models, they use a defined set of symbols such as rectangles, diamonds, ovals, and connecting lines to depict the interconnectedness of entities, relationships, and their attributes. They mirror grammatical structure, with entities as nouns and relationships as verbs.

Here, we use tables with (E) or (R) to represent entities and relationships, and rows to represent attributes.

Process:

Given the topic and main functions, we can easily find out that this part is about modeling the interactions among bookstores. Book\_info, Userinfo, Sales, and Accounts are involved in this scenario. What we need to do is to model these entities and connections, and further construct a database management system to manage those structural data.

After analyzing the blueprint, we create an E-R diagram.

First, we abstract and create several, like Book\_info, Userinfo, Sales, and Accounts.

Second, we add necessary attributes to the entities, with some of them primary attributes.

Last, we connect these entities with relations, according to the connections among them.

E-R Diagram:

Graphical user interface, application, Teams

Description automatically generated

Annotations:

* In this diagram, rectangles represent entities, and diamonds represent relations.
* Rows in a table stand for attributes of this entity/relation. Ones underlined stands for the key attributes.

Verification

1. User Management

* An entity called "Userinfo" can be created to store information about system users, including their username, password (encrypted using the MD5 algorithm), real name, work number, gender, age, and other basic information.

1. Book Inventory Management

* An entity called "Bookinfo" can be created to store information about books in stock, including their ISBN number, book name, publisher, and author.

1. Book Search

* The "Bookinfo" entity can have multiple attributes (such as ISBN number, book name, publisher, and author) that can be used to search for books in stock.

1. Book Information Modification

* The "Book" entity can have multiple attributes (such as book name, author, and publisher) that can be modified.

1. Add a new book

* For books that have been paid for, they can be added to the "Bookinfo" entity with their information.

1. Book Purchase

* The "Sale" entity can have an attribute called "stock" that can be decremented when a book is purchased.

1. Financial Management

* Entity "Sales" can store information about billing records, including the amount, type (expense or receipt), and date.

1. View Billing

* The "Sales" entity can have an attribute called "date" that can be used to filter billing records for a certain period of time.