**COMP 3005 Project (Fall 2022)**

1. **Conceptual Design**
   1. **Assumptions:**

Publisher:

Each publisher has only one address, phone number and bank account.

User:

Each user has only one address and phone number and unique username.

Book:

Each book is published by only on publisher and has one or more authors. In addition, it has unique ISBN. Moreover, the book may exist in one or more orders.

Author:

Each author has a unique id and can write one or more book.

Order:

Each order contains one or more book and has unique id. In addition, it has date, current location, and total cost.

* 1. **ER-Diagram:**

**Diagram

Description automatically generated**

1. **Reduction to Relation Schemas**

Diagram

Description automatically generated

1. **Normalization of Relation Schemas**

**Publisher**:

P\_id → Name, Email, phoneNumber, Address, BankAccount

(p\_id)+ = {p\_id, Name, Email, phoneNumber, Address, BankAccount}

Currently, the Publisher relation is in BCNF where all the attributes of the relation are directly dependent only on the primary key.

**User**:

U\_id → FirstName, LastName, Email, PhoneNumber, Gender, Username, Password, Address, BankAccount

(U\_id)+ = {U\_id, FirstName, LastName, Email, PhoneNumber, Gender, Username, Password, Address, BankAccount}

Currently, the User relation is in BCNF where all the attributes of the relation are directly dependent only on the primary key.

**Book**:

ISBN → Title, numberofPages, price, genere, Quantity, P\_id, P\_percentage

(ISBN)+ = {ISBN, Title, numberofPages, price, genre, Quantity, P\_id, P\_percentage}

Currently, the Book relation is in BCNF where all the attributes of the relation are directly dependent only on the primary key.

**Author**:

A\_id → FirstName, LastName

(A\_id)+ = {A\_id, FirstName, LastName}

Currently, the Author relation is in BCNF where all the attributes of the relation are directly dependent only on the primary key.

**Order**:

O\_id → TrackingNumber, Date, TotalCost, ShippingAddress, BillingAddress, Location, ShippingService, U\_id

(O\_id)+ = {O\_id, TrackingNumber, Date, TotalCost, ShippingAddress, BillingAddress, Location, ShippingService, U\_id}

Currently, the Order relation is in BCNF where all the attributes of the relation are directly dependent only on the primary key.

**Author\_Book:**

Since the relation has only two attributes, its in the BCNF and no need to decomposition.

**Order\_Book:**

O\_id, ISBN → Quantity

(O\_id, ISBN)+ = {O\_id, ISBN, Quantity}

Currently, the Order\_Book relation is in BCNF where all the Quantity is dependent on the O\_id and ISBN.

1. **Database Schema Diagram**

Graphical user interface, diagram

Description automatically generated

**Screen Shoots**

**User Screen**

1. First, the user search for a book using ISBN, Title, or Genre.

Graphical user interface

Description automatically generated

1. Then, all the books that match the word appear to the user to select between them and then, click buy.

Graphical user interface, application

Description automatically generated

1. Then, the user adds the quantity, shipping, and billing address and then new order is created with this book.

Graphical user interface, application

Description automatically generated

**Owner/Manager Screen**

1. First, the owner can add a new author, new publisher, or new book.

Graphical user interface, application

Description automatically generated

Graphical user interface, text, application

Description automatically generated

Timeline

Description automatically generated

Graphical user interface, application

Description automatically generated

Graphical user interface, application, Word

Description automatically generated

Graphical user interface, application, Teams

Description automatically generated

Graphical user interface, application

Description automatically generated

Graphical user interface, text, application

Description automatically generated

Graphical user interface, application

Description automatically generated

Graphical user interface, text, application, email

Description automatically generated