Feng Du

COMP3005 Report

**Conceptual Design**

Graphical user interface

Description automatically generated

Diagram

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The identifying entity of basket is user (denoted by pulse shaped line). Cardinalities are explicitly stated using multiplicities.

**Relational Schema**

book(ISBN**,** author, title, genre, pages, price, stock, publisher\_ID)

publisher(publisher\_ID, name, email, address, phone, commission\_percent)

bank\_account(bank\_account\_ID, balance, publisher\_ID)

user(account\_ID, name, email, phone\_number)

order(order\_ID, date, tracking\_ID, card\_number, account\_ID)

billing\_info(card\_number, billing\_address, shipping\_address, account\_ID)

in\_cart(ISBN, account\_ID, amount)

order\_contains(ISBN, order­\_ID, amount)

**Functional Dependencies**

ISBN → author, title, genre, pages, price, stock, publisher\_ID

publisher\_ID → name, email, address, phone, commission\_percent

bank\_account\_ID → balance, publisher\_ID

account\_ID → name, email, phone\_number

order\_ID → date, tracking\_ID, card\_number, account\_ID

card\_number → billing\_address, shipping\_address, account\_ID

ISBN, account\_ID → amount

ISBN, order\_ID → amount

**Normalization**

book(ISBN**,** author, genre, pages, price, stock, publisher\_ID) is in BCNF since for every non-trivial FD, LHS is a super key given ISBN → author, genre, pages, price, stock, publisher\_ID.

publisher(publisher\_ID, name, email, address, phone, commission\_percent) is in BCNF since for every non-trivial FD, LHS is a super key given publisher\_ID → name, email, address, phone, commission\_percent.

bank\_account(bank\_account\_ID, balance, publisher\_ID) is in BCNF since for every non-trivial FD, LHS is a super key given bank\_account\_ID → balance, publisher\_ID.

user(account\_ID, name, email, phone\_number) is in BCNF since for every non-trivial FD, LHS is a super key given account\_ID → name, email, phone\_number.

order(order\_ID, date, tracking\_ID, card\_number, account\_ID) is in BCNF since for every non-trivial FD, LHS is a super key given account\_ID → name, email, phone\_number.

billing\_info(card\_number, billing\_address, shipping\_address, account\_ID) is in BCNF since for every non-trivial FD, LHS is a super key given card\_number → billing\_address, shipping\_address, account\_ID.

in\_cart(ISBN, account\_ID) and order\_contains(ISBN, order­\_ID) are both is BCNF as ISBN, account\_ID → amount and ISBN, order\_ID → amount have super keys on the LHS.

**Database Schema Design**

Diagram

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**Implementation**

Text

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When a guest opens the application they are greeted with 4 options

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A guest can create an account by entering 3 and following the prompts

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Once a user can log in by enter their user ID

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Once logged in a user will have the option to add books to cart and checkout their cart

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A user and guest can look at the selection of books

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Description automatically generated

A user can add items to their cart

Text

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A user can view their cart

Text

Description automatically generated

A user can empty their cart

Text

Description automatically generated

A user can add payment information

Text

Description automatically generated

A user can checkout their cart if they have a valid payment option

Text

Description automatically generated

A user can view all their past orders and tracking numbers. They can then select an order to view the contents of that order.

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A user can logout and exit the program.

Text

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An owner has the following options. Viewing books is the same for guests, registered users, and owners.

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An owner can add a book to their inventory. There are 3 publishers available.

Text

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An owner can remove a book from inventory

Text

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Text

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Text

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Text

Description automatically generated

An owner can view sales by publisher, author, genre, and all time sales.

Text

Description automatically generated

An owner can add books to stock

**GitHub Repository**

<https://github.com/GnefDu/COMP3005-Project>

DDL and relations are provided in SQL folder. Full size images of ER diagram and relation schema are provided in the repository.

**Availability**

Any time after 2 pm on Dec 20.