CSE 3241 Project Checkpoint 2

Relational Model and Relational Algebra

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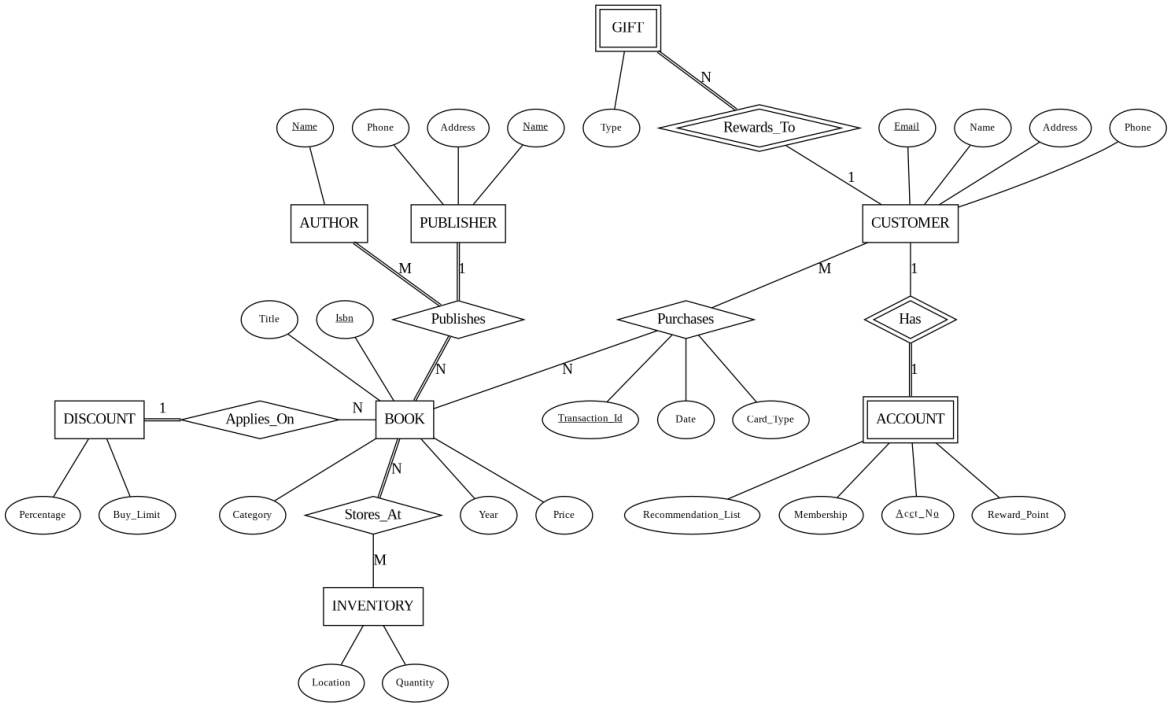
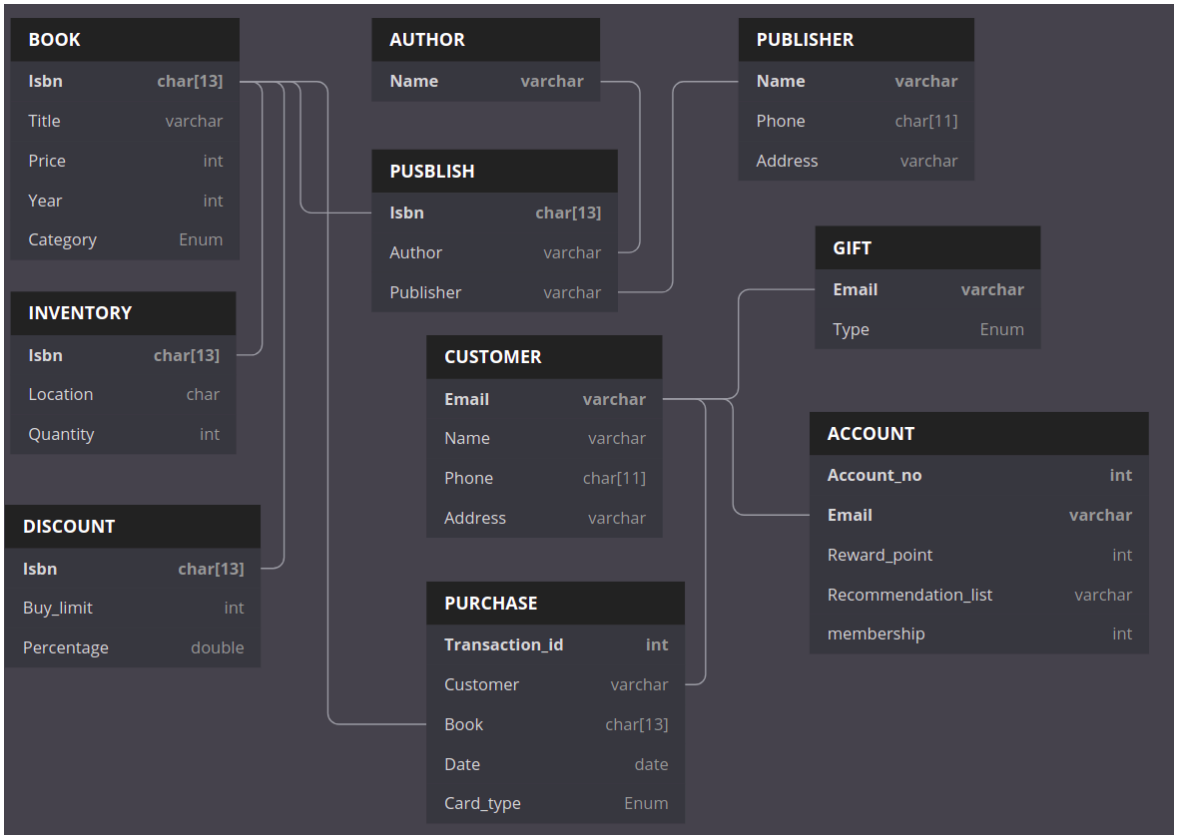
1. Updated ER Model



2. Relational Schema



3. (a) Find the titles of all books by Pratchett that cost less than $10

$$\pi_{Title}(\sigma_{Price<10}(BOOK))$$

(b) Give all the titles and their dates of purchase made by a single customer (you choose how to designate the customer)
designate CUSTOMER with Email

$$BOOKS \leftarrow BOOK \bowtie_{Isbn=Book} (\sigma_{Customer=Email}(PURCHASE))$$

$$RESULT \leftarrow \pi_{Title,Date}(BOOK)$$

(c) Find the titles and ISBNs for all books with less than 5 copies in stock

$$STOCK(Isbn,\ Quantity) \leftarrow_{Isbn} \mathcal{F}_{SUM\ Quantity}(INVENTORY)$$

$$RESULT \leftarrow \pi_{Title,Isbn}(\sigma_{Quantity<5}(STOCK))$$

(d) Give all the customers who purchased a book by Pratchett and the titles of

Pratchett books they purchased

$$PRATCHETTS \leftarrow (\sigma_{Author=Pratchett}(PUBLISH) * BOOK)$$

$$SALES \leftarrow (PRATCHETTS * PURCHASE)$$

$$RESULT \leftarrow (\pi_{Email,Name,Title}(SALES))$$

(e) Find the total number of books purchased by a single customer (you choose how to designate the customer)

$$COUNT(Customer,\ \#\ of\ Books) \leftarrow_{Customer} \mathcal{F}_{COUNT\ BOOK}(PURCHASE)$$

$$RESULT \leftarrow \sigma_{Customer=Email}(COUNT)$$

(f) Find the customer who has purchased the most books and the total number of books they have purchased

$$COUNT(Customer,\ No) \leftarrow_{Customer} \mathcal{F}_{COUNT\ BOOK}(PURCHASE)$$

$$RESULT \leftarrow_{Customer} \mathcal{F}_{MAX\ No}(COUNT)$$

4. (a) Find the CUSTOMER with the most Reward_point on his/her account

$$CACCT \leftarrow CUSTOMER * ACCOUNT$$

$$RESULT \leftarrow \pi_{Email,\ Name}({}_{Email,\ Name}\mathcal{F}_{MAX\ Reward\_point}(CACCT))$$

(b) Find the most expensive BOOK with all the DISCOUNT applied

$$DIS\_BOOKS \leftarrow BOOK \rtimes DISCOUNT$$

$$RESULT \leftarrow_{Isbn,\ Title} \mathcal{F}_{MAX(Price*percentage)}(DIS\_BOOKS)$$

(c) Find the total price of all the BOOK for each stock (quantity * price)

$$STOCK \leftarrow BOOK *_{Isbn} \mathcal{F}_{SUM\ Quantity}(INVENTORY)$$

$$RESULT \leftarrow \pi_{Isbn,Quantity\ *\ Price}(STOCK)$$