

DBMS Mini Project

Assignment - 3

Name	SRN
Aanchal Narendran	PES1UG19CS006
Ananya Uppal	PES1UG19CS058
Anisha Ghosh	PES1UG19CS067

Problem Statement: Online Book Store with an Inbuilt Genre Classification System

Application Name: EZBook

Problem Statement Description:

The current issue faced by physical bookstores is the fact that classification is primarily manual and is prone to human errors. We aim to make the classification of books into their genres more automated and user friendly. This advancement will tailor to the needs of the new generation of readers.

According to the Gartner- Hype Cycle, Data classification is one of the up and coming technologies here to stay for 2-5 years.

Task-1: Complete Working model of the Database application

Simple Queries

- Given the bill number, display the payment details of that transaction
 - Query: **select billdate,totalamount,modeofpayment from Bills where billnumber=403;**

```
ezbook=# select billdate,totalamount,modeofpayment from Bills where billnumber=403;
 billdate | totalamount | modeofpayment 
-----+-----+-----
 2020-02-18 |      1279.00 | Card
(1 row)
```

- Given the customer ID , find the title of the books bought
 - Query: **SELECT C.CustomerId , B.bname
FROM BUYS C , BOOKS B WHERE C.isbn = B.isbn;**

customerid	bname
1	Inner Circle
1	A Time to Embrace
1	Omerta
2	Cycle of the Werewolf
2	When We Were Very Young
3	Omerta
3	Inner Circle
3	A Time to Embrace
3	When We Were Very Young
4	Inner Circle

(10 rows)

3. Number of books produced by each pub. House

- a. Query: **SELECT COUNT(ISBN)**
FROM PublicationHouse
GROUP BY Publication_House;

count
1
1
1
1
1
1
1
2
1
1
1
1
1

(12 rows)

4. Find the oldest book

- a. Query: **SELECT * FROM BOOKS WHERE PublishingYear in**
(
SELECT MIN(PublishingYear)
FROM BOOKS
);

isbn	bookid	bname	genre	author	publishingyear	price	rating
525444459	821003	When We Were Very Young	Poetry, Childrens	A.A. Milne, Ernest H. Shepard	1924	50.00	4.3

(1 row)

5. Select all books with rating > 3

- a. Query : **SELECT * FROM BOOKS WHERE rating>3;**

isbn	bookid	price	rating	bname	genre	author
publishingyear						
1416950419	630104	50.00	4.0	Inner Circle	Young Adult, Mystery	Kate Brian, Julian Peplow
1595542329	9487	50.00	4.4	A Time to Embrace	Christian Fiction, Christian	Karen Kingsbury
765354950	39030	50.00	4.0	Reliquary	Thriller, Mystery	Douglas Preston, Lincoln Child
671015206	998	50.00	4.0	The Millionaire Next Door: The Surprising Secrets of Americas Wealthy	Economics-Finance, Nonfiction	Thomas J. Stanley, William D.
99468034	311164	50.00	4.1	Black Sheep	Romance, Historical-Historical Fiction	Georgette Heyer
1565124138	377993	50.00	4.2	Joe	Fiction, American-Southern	Larry Brown
525444459	821003	50.00	4.3	When We Were Very Young	Poetry, Childrens	A.A. Milne, Ernest H. Shepard
451466802	24876258	50.00	4.2	The Aeronauts Windlass	Fantasy, Science Fiction-Steampunk	Jim Butcher
743454154	80631	50.00	4.1	Blood Memory	Mystery,Fiction	Greg Iles
375756485	81048	50.00	4.0	Spilling Open: The Art of Becoming Yourself	Art, Nonfiction	Sabrina Ward Harrison
345432401	22028	50.00	3.7	Omerta	Fiction, Mystery-Crime	Mario Puzo
812511751	176892	50.00	4.0	The Elvenbane	Fantasy, Fantasy-Dragons	Andre Norton, Mercedes Lackey
451822196	550844	50.00	3.7	Cycle of the Werewolf	Horror, Fiction	Stephen King, Bernie Wrightson
(13 rows)						

Complex Queries

- Given the customer name, display the cart of the customer
 - Query: **Select title, quantity, price, quantity*price as SubTotal from (select bname as title, book_count as quantity, price from (select bname, bookid,price from books where isbn in (select isbn from buys where customerid in (select customerid from customer where custname='Bob')))) as A join (select book_count,Bookid from Cart where customerid in (select customerid from customer where custname='Bob') and bookid in (select producedbookid from produces where publicationisbn in (select isbn from buys where customerid in (select customerid from customer where custname='Bob')))) as B on A.bookid=B.bookid) as C;**

```
ezbook=# Select title, quantity, price, quantity*price as Subtotal from (select bname as title, book_count as quantity, price from (select bname, bookid,price from books where isbn in (select isbn from buys where customerid in (select customerid from customer where custname='Bob')))) as A join (select book_count,Bookid from Cart where customerid in (select customerid from customer where custname='Bob') and bookid in (select producedbookid from produces where publicationisbn in (select isbn from buys where customerid in (select customerid from customer where custname='Bob')))) as B on A.bookid=B.bookid) as C;
```

title	quantity	price	subtotal
Cycle of the Werewolf	1	50.00	50.00
When We Were Very Young	2	50.00	100.00

(2 rows)

- Identify the current bestsellers based on the count of Books sold
 - Query: **Select bname as title, quantity_sold as Count from (select bname, isbn from books where isbn in (select distinct isbn from CountBooks)) as A join (select isbn,count(*) as quantity_sold from CountBooks group by ISBN) as B on A.isbn=B.isbn order by quantity_sold desc;**

```
ezbook=# Select bname as title, quantity_sold as Count from (select bname, isbn from books where isbn in (select distinct isbn from CountBooks)) as A join (select isbn,count(*) as quantity_sold from CountBooks group by ISBN) as B on A.isbn=B.isbn order by quantity_sold desc;
```

title	count
Inner Circle	4
When We Were Very Young	2
Omerta	2
A Time to Embrace	1
Cycle of the Werewolf	1

(5 rows)

- Given the ISBN , find books not bought by any customer

Query :**SELECT isbn , bname , price , rating FROM BOOKS
WHERE isbn not in (
SELECT isbn FROM BUYS);**

isbn	bname	price	rating
765354950	Reliquary	50.00	4.0
671015206	The Millionaire Next Door: The Surprising Secrets of Americas Wealthy	50.00	4.0
99468034	Black Sheep	50.00	4.1
1565124138	Joe	50.00	4.2
451466802	The Aeronauts Windlass	50.00	4.2
743454154	Blood Memory	50.00	4.1
375756485	Spilling Open: The Art of Becoming Yourself	50.00	4.0
812511751	The Elvenbane	50.00	4.0

(8 rows)

4. Given the ISBN , obtain customer feedback for books not in bestsellers

a. Query: **SELECT CustDesc, isbn FROM CUSTOMERFEEDBACK
WHERE isbn not in (
SELECT isbn from BestSellers);**

```
custdesc | isbn
-----+-----
(0 rows)
```

5. Given ISBN , obtain ISBN for books not in Produces.

a. Query : **SELECT PublicationISBN FROM PRODUCES
WHERE PublicationISBN not in
(
SELECT isbn FROM BOOKS
);**

```
publicationisbn
-----
(0 rows)
```

Analysis of Query Execution

1. Analysing the query to obtain bestsellers based on the count

```
ezbook=# explain analyze Select bname as title, quantity_sold as Count from (select bname, isbn from books where isbn in (select distinct isbn
from CountBooks)) as A join (select isbn,count(*) as quantity_sold from CountBooks group by ISBN) as B on A.isbn=B.isbn order by quantity_sold
desc;
               QUERY PLAN
-----
Sort (cost=85.01..85.49 rows=190 width=40) (actual time=0.115..0.118 rows=5 loops=1)
  Sort Key: b.quantity_sold DESC
  Sort Method: quicksort  Memory: 25kB
-> Hash Join (cost=64.90..77.82 rows=190 width=40) (actual time=0.096..0.105 rows=5 loops=1)
  Hash Cond: ((books.isbn)::text = (b.isbn)::text)
-> Hash Join (cost=31.00..43.41 rows=190 width=108) (actual time=0.057..0.064 rows=5 loops=1)
  Hash Cond: ((books.isbn)::text = (countbooks.isbn)::text)
-> Seq Scan on books (cost=0.00..11.90 rows=190 width=70) (actual time=0.013..0.015 rows=13 loops=1)
-> Hash (cost=28.50..28.50 rows=200 width=38) (actual time=0.033..0.033 rows=5 loops=1)
  Buckets: 1024  Batches: 1  Memory Usage: 9kB
-> HashAggregate (cost=24.50..26.50 rows=200 width=38) (actual time=0.019..0.021 rows=5 loops=1)
  Group Key: countbooks.isbn
  Batches: 1  Memory Usage: 40kB
-> Seq Scan on countbooks (cost=0.00..21.60 rows=1160 width=38) (actual time=0.004..0.006 rows=10 loops=1)
-> Hash (cost=31.40..31.40 rows=200 width=46) (actual time=0.020..0.021 rows=5 loops=1)
  Buckets: 1024  Batches: 1  Memory Usage: 9kB
-> Subquery Scan on b (cost=27.40..31.40 rows=200 width=46) (actual time=0.010..0.014 rows=5 loops=1)
-> HashAggregate (cost=27.40..29.40 rows=200 width=46) (actual time=0.010..0.012 rows=5 loops=1)
  Group Key: countbooks_1.isbn
  Batches: 1  Memory Usage: 40kB
-> Seq Scan on countbooks countbooks_1 (cost=0.00..21.60 rows=1160 width=38) (actual time=0.002..0.004 rows=10 loops=1)
Planning Time: 0.432 ms
```

2. Analyse query which finds books not bought by any customer.

```
ezbook=# explain analyse SELECT isbn , bname , price , rating FROM BOOKS
ezbook=# WHERE isbn not in (
ezbook=# SELECT isbn FROM BUYS);

              QUERY PLAN
-----
Seq Scan on books  (cost=23.75..36.13 rows=95 width=96) (actual time=0.073..0.076 rows=8 loops=1)
  Filter: (NOT (hashed SubPlan 1))
  Rows Removed by Filter: 5
  SubPlan 1
    -> Seq Scan on buys  (cost=0.00..21.00 rows=1100 width=38) (actual time=0.011..0.012 rows=10 loops=1)
Planning Time: 1.266 ms
Execution Time: 0.228 ms
(7 rows)
```

Task-2: Create multiple users and define their access privileges

There are three main users in this mini-world. A customer, A Cashier and An Admin

Customer permissions:

1. BestSellers: View
2. Bills: View
3. Cart: View, Update
4. Customer(table): View, Update
5. CustomerFeedback: View, Update, Delete
6. Books: View
7. PublishingHouse: View
8. Request for Books: View, Edit
9. Screenshots

```
ezbook=# create user customer with nosuperuser;
CREATE ROLE
ezbook=# grant connect on database 'ezbook' to customer;
ERROR:  syntax error at or near "'ezbook'"
LINE 1: grant connect on database 'ezbook' to customer;
                                   ^
ezbook=# grant connect on database "ezbook" to customer;
GRANT
ezbook=# grant select on BestSellers to customer;
GRANT
ezbook=# grant select on Bills to customer;
GRANT
ezbook=# grant select on Cart to customer;
GRANT
```

```
ezbook=# grant update on Cart to customer;
GRANT
```

Cashier permissions:

1. CountBooks: View
2. Bills: View and Update
3. Cart: View
4. Screenshots

```
ezbook=# create user cashier with nosuperuser;  
CREATE ROLE  
ezbook=# grant connect on database "ezbook" to cashier;  
GRANT  
ezbook=# grant select on countbooks to cashier;  
GRANT  
ezbook=# grant select on bills to cashier;  
GRANT  
ezbook=# grant update on bills to cashier;  
GRANT  
ezbook=# grant select on cart to cashier;  
GRANT
```

Admin Permissions

1. CountBooks: View, Update
2. BestSeller: View, Update, Delete
3. Bills: View, Update, Delete
4. Cart: View, Delete
5. Customer: View, Delete
6. Buys: View
7. CustomerFeedback: View
8. Books: View, Update, Delete
9. Produces: View and Update
10. Writer/Publisher: View, Update, Delete
11. RequestForBooks: View, Update, Delete
12. Screenshots

```
ezbook=# create user admin with nosuperuser;
CREATE ROLE
ezbook=# grant connect on database "ezbook" to admin;
GRANT
ezbook=# grant select on countbooks to admin;
GRANT
ezbook=# grant update on countbooks to admin;
GRANT
ezbook=# grant update on bestsellers to admin;
GRANT
ezbook=# grant delete on bestsellers to admin;
GRANT
ezbook=# grant select on bestsellers to admin;
GRANT
ezbook=# grant delete on bills to admin;
GRANT
ezbook=# grant select on bills to admin;
GRANT
ezbook=# grant update on bills to admin;
GRANT
ezbook=# grant select on cart to admin;
GRANT
ezbook=# grant delete on cart to admin;
GRANT
```

```
ezbook=# grant select on customer to admin;  
GRANT  
ezbook=# grant delete on customer to admin;  
GRANT  
ezbook=# grant update on customer to admin;  
GRANT  
ezbook=# grant select on customer to cust;  
GRANT  
ezbook=# grant update on customer to cust;  
GRANT  
ezbook=#  
ezbook=# grant select on buys to admin;  
GRANT  
ezbook=#  
ezbook=# grant select on customerfeedback to admin;  
GRANT  
ezbook=# grant select on customerfeedback to cust;  
GRANT  
ezbook=# grant update on customerfeedback to cust;  
GRANT  
ezbook=# grant delete on customerfeedback to cust;
```



```
ezbook=# grant delete on customerfeedback to cust;  
GRANT  
ezbook=# grant select on books to admin;  
GRANT  
ezbook=# grant update on books to admin;  
GRANT  
ezbook=# grant delete on books to admin;  
GRANT  
ezbook=# grant select on books to cust;  
GRANT  
ezbook=#  
ezbook=# grant select on produces to admin;  
GRANT  
ezbook=# grant update on produces to admin;  
GRANT  
ezbook=# grant delete on produces to admin;  
GRANT  
ezbook=#  
ezbook=# grant select on PublicationHouse to admin;  
GRANT  
ezbook=# grant update on PublicationHouse to admin;  
GRANT  
ezbook=# grant delete on PublicationHouse to admin;  
GRANT  
ezbook=# grant select on PublicationHouse to cust;  
GRANT  
ezbook=#
```

```
ezbook=# grant select on RequestForBooks to admin;  
GRANT  
ezbook=# grant delete on RequestForBooks to admin;  
GRANT  
ezbook=# grant select on RequestForBooks to cust;  
GRANT  
ezbook=# grant update on RequestForBooks to cust;  
GRANT  
ezbook=#
```