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No-SQL versus relational databases  
*Course Assignment 1*

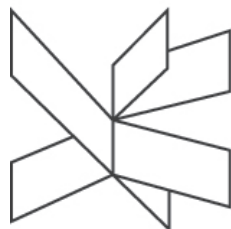
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20th February 2022

Software Technology Engineering

IT-NSQ1-S22



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# 1 Question 1

Make an (E)ER model of the bookstore. Get as close to the actual bookstore as possible.

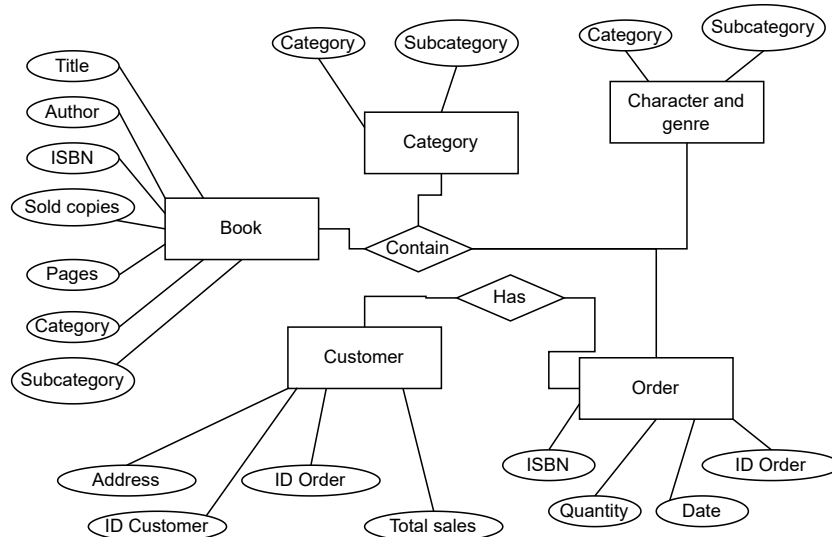


Figure 1: ER model of the bookstore.

# 2 Question 2

Map the model to the database. (Logical model)

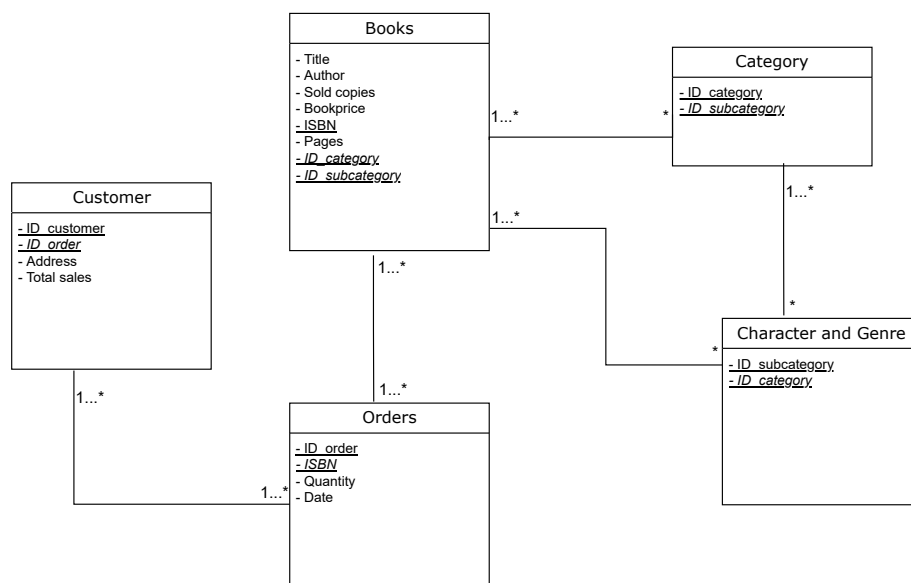


Figure 2: UML of the bookstore database.

### 3 Question 3

Implement the model using SQL.

Creation of *Books* table:

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```
1 CREATE TABLE Books(  
2     ISBN INTEGER PRIMARY KEY,  
3     Author VARCHAR,  
4     SoldCopies VARCHAR,  
5     Bookprice VARCHAR,  
6     Pages INTEGER,  
7     idcategory VARCHAR REFERENCES category(idcategory),  
8     idsubcategory VARCHAR REFERENCES characterandgenre(idsubcaegory)  
9 );
```

---

Inserting data into *Books* table:

---

```
1 INSERT INTO books(isbn,author,soldcopies,pages,idcategory,idsubcategory)  
2 VALUES (1235,'Jose','100','250','biography','historical');
```

---

Creation of table *Customer*:

---

```
1 CREATE TABLE Customer(  
2     idcustomer VARCHAR PRIMARY KEY,  
3     idorder VARCHAR REFERENCES orders(idorder),  
4     address VARCHAR,  
5     totalsales VARCHAR  
6 );
```

---

Inserting data into *Customer* table:

---

```
1 INSERT INTO customer(isbn,author,soldcopies,pages)  
2 VALUES (1234,'Jordi Lazo','120','300');
```

---

Creation of *Category* table:

---

```
1 CREATE TABLE Category(  
2     IDcategory VARCHAR PRIMARY KEY,  
3     idsubcategory VARCHAR REFERENCES characterandgenre(idsubcategory)  
4 );
```

---

Inserting data into *Category* table:

---

```
1 INSERT INTO category(idcategory,idsubcategory)  
2 VALUES ('biography','historical');
```

---

Creation of *Orders* table:

---

```
1 CREATE TABLE orders(  
2     idorder VARCHAR PRIMARY KEY,
```

```
3     ISBN INTEGER REFERENCES books(ISBN),
4     quantity INTEGER,
5     date VARCHAR
6 );
```

---

Inserting data into *Orders* table:

```
1 INSERT INTO customer(idcustomer,idorder,address,totalsales)
2 VALUES (1,1,'Horsens','10');
```

---

Creation of *Character and Genre* table:

```
1 CREATE TABLE characterandgenre(
2     idsubcategory VARCHAR PRIMARY KEY,
3     idcategory VARCHAR REFERENCES category(idcategory)
4 );
```

---

Inserting data into *Character and Genre* table:

```
1 INSERT INTO characterandgenre(idsubcategory,idcategory)
2 VALUES ('historical','biography');
```

---

## 4 Question 4

Write SQL statements to return the following data:

1. All books by an author

```
1 SELECT author, isbn
2 FROM books
3 ORDER BY author DESC;
```

---

2. Total price of an order

```
1 SELECT orders.quantity*books.bookprice as TOTAL
2 FROM orders,books
3 WHERE orders.isbn=books.isbn;
```

---

3. Total sales to a customer

```
1 SELECT author, isbn
2 FROM books
3 ORDER BY author DESC;
```

---

4. Books that are categorized as neither science fiction nor fantasy

```
1 SELECT author, isbn
2 FROM books
3 ORDER BY author DESC;
```

---

5. Average page count by genre

---

```
1 SELECT author, isbn
2 FROM books
3 ORDER BY author DESC;
```

---

6. Categories that have no sub-categories

---

```
1 SELECT author, isbn
2 FROM books
3 ORDER BY author DESC;
```

---

7. ISBN numbers of books with more than one author

---

```
1 SELECT author, isbn
2 FROM books
3 ORDER BY author DESC;
```

---

8. ISBN numbers of books that sold at least X copies (you decide the value for X)

---

```
1 SELECT author, isbn
2 FROM books
3 ORDER BY author DESC;
```

---

9. outNumber of copies of each book sold – unsold books should show as 0 sold copies.

---

```
1 SELECT author, isbn
2 FROM books
3 ORDER BY author DESC;
```

---

10. Best-selling books: The top 10 selling books ordered in descending order by number of sales.

---

```
1 SELECT author, isbn
2 FROM books
3 ORDER BY author DESC;
```

---

11. Best-selling genres: The top 3 selling genres ordered in descending order by number of sales.

---

```
1 SELECT author, isbn
2 FROM books
3 ORDER BY author DESC;
```

---

## 5 Question 5

Write a report on the experience gained by completing Question 1 through 4 above. The report should contain answers to the questions:

- What were the decisions taken in the modelling?  
Decisions were made based on the questions asked in question 4. First I made a UML diagram with the most basic information in each table and depending on the questions, new attributes were added and new values were inserted.
- Why were these decisions taken?  
These decisions were made because I believe that trial and error is the fastest way I have been able to arrive at the correct solution. First writing and testing SQL sentences and based on the results obtained I have modified the sentences and the tables of the database.
- What were the consequences of these decisions?  
the consequences were the constant modification and revision of the UML diagram and the database
- What were the difficult and easy parts of the exercise?  
The easiest part has been designed by first using the UML diagram. Then the hardest part has been writing and getting the desired results in postgresSQL as well as inserting the values.