Data modeling

Data modeling

1. Er Diagram
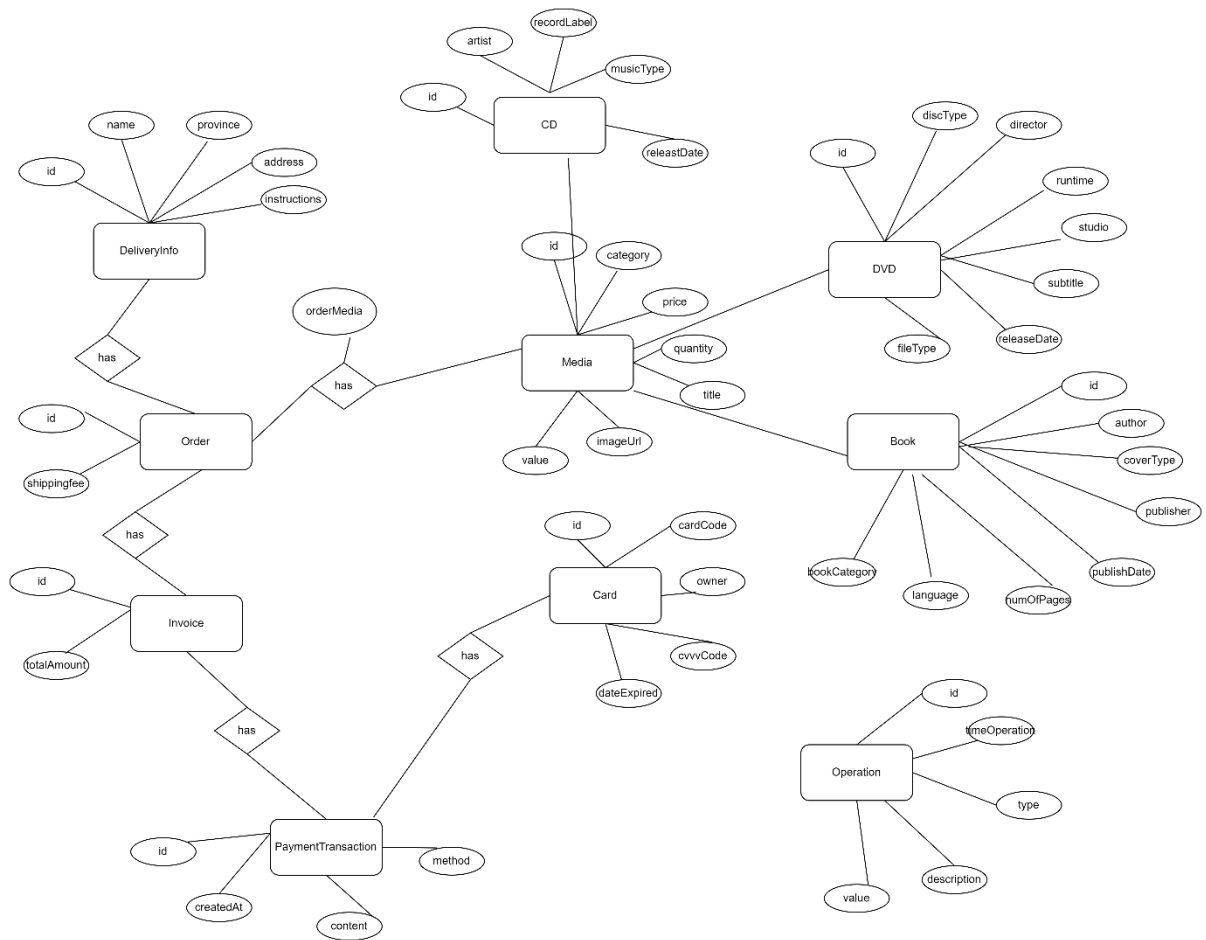
2. Database Design

2.1 Logical data

2.2 Physical Data

-Media
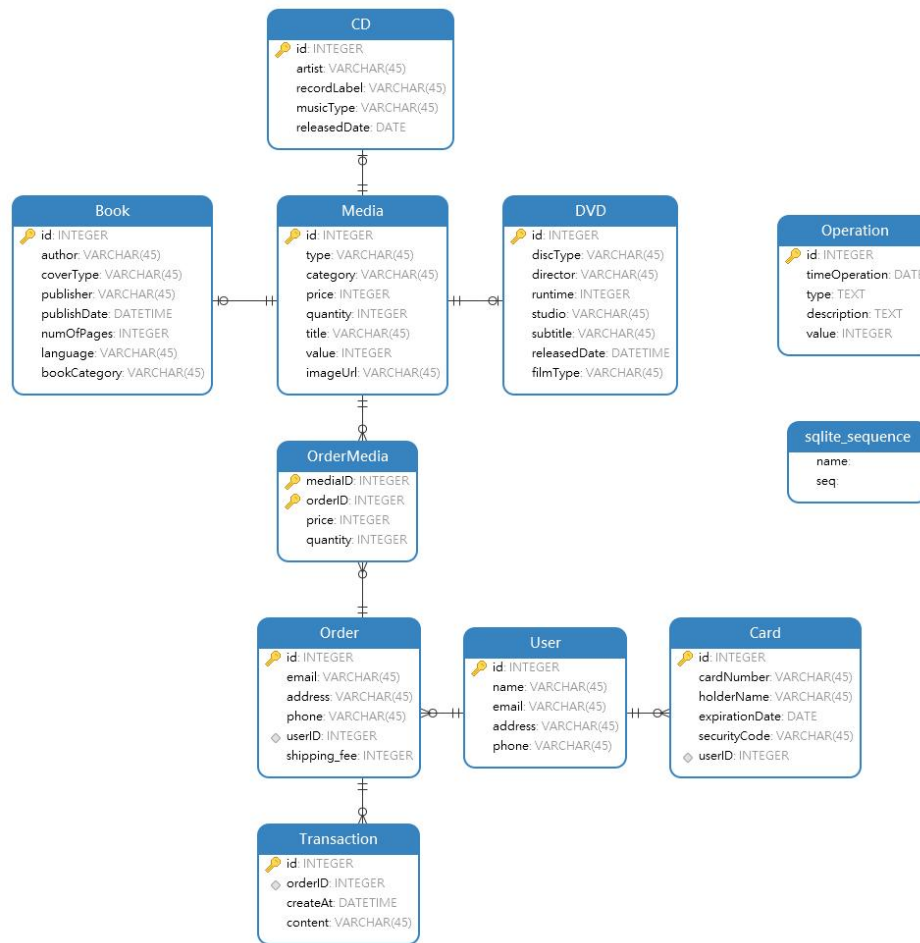
#	PK	FK	Column Name	Data type	Mandatory	Description
1.	x		id	Integer	Yes	ID, auto increment
2.			category	VARCHAR(45)	Yes	Media type, e.g., pop, ballad
3.			price	Integer	Yes	Current price
4.			quantity	Integer	Yes	Number of products
5.			title	VARCHAR(45)	Yes	Product name
6.			value	Integer	Yes	Value of the product
7.			imageUrl	VARCHAR(45)	Yes	Product image path

#	PK	FK	Column Name	Data type	Mandatory	Description
8.			type	VARCHAR(45)	Yes	Type (book, dvd, cd)

-CD

#	PK	FK	Column Name	Data type	Mandatory	Description
1.		x	id	Integer	Yes	ID, same as ID of Media of which type is CD
2.			artist	VARCHAR(45)	Yes	Artist's name
3.			recordLabel	VARCHAR(45)	Yes	Record label
4.			musicType	VARCHAR(45)	Yes	Music genres
5.			releasedDate	DATE	No	Release date

-Book

#	PK	FK	Column Name	Data type	Mandatory	Description
1.		x	id	Integer	Yes	ID, same as ID of Media of which type is Book
2.			author	VARCHAR(45)	Yes	Author
3.			coverType	VARCHAR(45)	Yes	Cover type
4.			publisher	VARCHAR(45)	Yes	Publishing house
5.			publishDate	DATETIME	Yes	Date of publishing
6.			numOfPages	Integer	Yes	Page number
7.			language	VARCHAR(45)	Yes	Language
8.			bookCategory	VARCHAR(45)	Yes	Book category

-DVD

#	PK	FK	Column Name	Data type	Mandatory	Description
1.		x	id	Integer	Yes	ID, same as ID of Media of which type is DVD
2.			discType	VARCHAR(45)	Yes	Disc type
3.			director	VARCHAR(45)	Yes	Director
4.			runtime	Integer	Yes	Duration
5.			studio	VARCHAR(45)	Yes	Manufacturer
6.			subtitle	VARCHAR(45)	Yes	Subtitles
7.			releasedDate	DATETIME	Yes	Release date
8.			filmType	VARCHAR(45)	Yes	Genres

-Card

#	PK	FK	Column Name	Data type	Mandatory	Description
1.	x		id	Integer	Yes	ID, auto increment
2.			cardNumber	VARCHAR(45)	Yes	Card number
3.			holderName	VARCHAR(45)	Yes	Card holders name
4.			expirationDate	VARCHAR(3)	Yes	Expiration date
5.			securityCode	VARCHAR(4)	Yes	Security code
6.		x	userID	Integer	Yes	User id of the card owner

-Order

#	PK	FK	Column Name	Data type	Mandatory	Description
1.	X		id	Integer	Yes	ID

#	PK	FK	Column Name	Data type	Mandatory	Description
2.			shippingFees	Integer	Yes	Shipping fee
3.		X	userID	Integer	Yes	User ID
4.			email	VARCHAR(45)	Yes	email
5.			address	VARCHAR(45)	Yes	address
6.			phone	VARCHAR(45)	Yes	number phone

-OrderMedia

#	PK	FK	Column Name	Data type	Mandatory	Description
1.		X	mediaID	Integer	Yes	Media ID
2.		X	orderID	Integer	Yes	Order ID
3.			price	Integer	Yes	Selling price
4.			quantity	Integer	Yes	Number

-Operation

#	PK	FK	Column Name	Data type	Mandatory	Description
1.	x		id	Integer	Yes	ID
2.			timeOperation	DATETIME	Yes	time operation
3.		x	type	VARCHAR(45)	Yes	type
4.			description	VARCHAR(45)	Yes	description
5.			value	Integer	Yes	value

-Transaction

#	PK	FK	Column Name	Data type	Mandatory	Description
1.	x		id	Integer	Yes	ID

#	PK	FK	Column Name	Data type	Mandatory	Description
2.		x	orderID	DATETIME	Yes	Date of creation
3.			createAt	DATETIME	Yes	Transaction time
4.			content	VARCHAR(45)	Yes	Transaction content

-User

#	PK	FK	Column Name	Data type	Mandatory	Description
1.	x		id	Integer	Yes	ID
2.			name	VARCHAR(45)	Yes	Name
3.			email	VARCHAR(45)	Yes	Emai;
4.			address	VARCHAR(45)	Yes	Address
5.			phone	VARCHAR(45)	Yes	Number phone

2.3 SQL code

```
CREATE TABLE "aims"."Media"(
  "id" INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
  "type" VARCHAR(45) NOT NULL,
  "category" VARCHAR(45) NOT NULL,
  "price" INTEGER NOT NULL,
  "quantity" INTEGER NOT NULL,
  "title" VARCHAR(45) NOT NULL,
  "value" INTEGER NOT NULL,
  "imageUrl" VARCHAR(45) NOT NULL
);
CREATE TABLE "aims"."CD"(
  "id" INTEGER PRIMARY KEY NOT NULL,
  "artist" VARCHAR(45) NOT NULL,
  "recordLabel" VARCHAR(45) NOT NULL,
  "musicType" VARCHAR(45) NOT NULL,
  "releasedDate" DATE,
  CONSTRAINT "fk_cd_media"
    FOREIGN KEY("id")
    REFERENCES "Media"("id")
);
CREATE TABLE "aims"."Book"(
  "id" INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
```

```sql
  "author" VARCHAR(45) NOT NULL,
  "coverType" VARCHAR(45) NOT NULL,
  "publisher" VARCHAR(45) NOT NULL,
  "publishDate" DATETIME NOT NULL,
  "numOfPages" INTEGER NOT NULL,
  "language" VARCHAR(45) NOT NULL,
  "bookCategory" VARCHAR(45) NOT NULL,
  CONSTRAINT "fk_book_media"
    FOREIGN KEY("id")
    REFERENCES "Media"("id")
);
CREATE TABLE "aims"."User"(
  "id" INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
  "name" VARCHAR(45) NOT NULL,
  "email" VARCHAR(45) NOT NULL,
  "address" VARCHAR(45) NOT NULL,
  "phone" VARCHAR(45) NOT NULL
);
CREATE TABLE "aims"."DVD"(
  "id" INTEGER PRIMARY KEY NOT NULL,
  "discType" VARCHAR(45) NOT NULL,
  "director" VARCHAR(45) NOT NULL,
  "runtime" INTEGER NOT NULL,
  "studio" VARCHAR(45) NOT NULL,
  "subtitle" VARCHAR(45) NOT NULL,
  "releasedDate" DATETIME,
  "filmType" VARCHAR(45) NOT NULL,
  CONSTRAINT "fk_dvd_media"
    FOREIGN KEY("id")
    REFERENCES "Media"("id")
);
CREATE TABLE "aims"." Operation " (
id INTEGER NOT NULL
PRIMARY KEY AUTOINCREMENT,
[timeOperation ] DATE NOT NULL,
type TEXT NOT NULL,
description TEXT,
value INTEGER NOT NULL
);

CREATE TABLE "aims"."Order"(
  "id" INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
  "email" VARCHAR(45) NOT NULL,
  "address" VARCHAR(45) NOT NULL,
```

```sql
  "phone" VARCHAR(45) NOT NULL,
  "userID" INTEGER NOT NULL,
  "shipping_fee" INTEGER NOT NULL,
  CONSTRAINT "fk_order_user"
    FOREIGN KEY("userID")
    REFERENCES "User"("id")
);
CREATE INDEX "aims"."Order.fk_order_user_idx" ON "Order" ("userID");
CREATE TABLE "aims"."OrderMedia"(
  "mediaID" INTEGER NOT NULL,
  "orderID" INTEGER NOT NULL,
  "price" INTEGER NOT NULL,
  "quantity" INTEGER NOT NULL,
  PRIMARY KEY("mediaID","orderID"),
  CONSTRAINT "fk_ordermedia_media"
    FOREIGN KEY("mediaID")
    REFERENCES "Media"("id"),
  CONSTRAINT "fk_ordermedia_order"
    FOREIGN KEY("orderID")
    REFERENCES "Order"("id")
);
CREATE INDEX "aims"."OrderMedia.fk_ordermedia_order_idx" ON
"OrderMedia" ("orderID");
CREATE TABLE "aims"."Transaction"(
  "id" INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
  "orderID" INTEGER NOT NULL,
  "createAt" DATETIME NOT NULL,
  "content" VARCHAR(45) NOT NULL,
  CONSTRAINT "fk_transaction_order"
    FOREIGN KEY("orderID")
    REFERENCES "Order"("id")
);
CREATE INDEX "aims"."Transaction.fk_transaction_order_idx" ON
"Transaction" ("orderID");
CREATE TABLE "aims"."Card"(
  "id" INTEGER PRIMARY KEY NOT NULL,
  "cardNumber" VARCHAR(45) NOT NULL,
  "holderName" VARCHAR(45) NOT NULL,
  "expirationDate" DATE NOT NULL,
  "securityCode" VARCHAR(45) NOT NULL,
  "userID" INTEGER NOT NULL,
  CONSTRAINT "fk_card_user"
    FOREIGN KEY("userID")
    REFERENCES "User"("id")
);
```

```
CREATE INDEX "aims"."Card.fk_card_user_idx" ON "Card" ("userID");
```