**Bài thực hành 01 – tuần 8, ngày 16/11/2021.**

**Họ và tên: Nguyễn Hoàng Anh – MSSV 20180010 – Lớp TH: 710809**

* Link đã nộp bài lên github : <https://github.com/hoanganhlc14600/TH-TKXDPM-710809>
* Nội dung báo cáo kết quả thực hành :

1. **Thiết kế lớp (Class Design)**
   1. **Nhóm các lớp thiết kế**

A picture containing timeline

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* 1. **Xác định mối quan hệ giữa các lớp**

Diagram

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* 1. Lớp thiết kế

1. Lớp “InterbankInterface”

Text

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***Attribute***

Không

***Operation***

|  |  |  |  |
| --- | --- | --- | --- |
| *#* | *Tên* | *Kiểu dữ liệu trả về* | *Mô tả (mục đích)* |
| 1 | payOrder | PaymentTransaction | Thanh toán đơn hàng và trả về giao dịch thanh toán |
| 2 | refund | PaymentTransaction | Hoàn tiền và trả về giao dịch thanh toán |

*Parameter:*

* card – thẻ tín dụng để giao dịch
* amount – số tiền giao dịch
* contents – nội dung giao dịch

*Exception:*

* PaymentException – nếu mã lỗi trả về đã biết
* UnrecognizedException – nếu không tìm thấy mã lỗi trả về hoặc có lỗi hệ thống

***Method***

Không

***State***

Không

1. Lớp “PaymentController”

Graphical user interface, application

Description automatically generated

***Attribute***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *#* | *Tên* | *Kiểu dữ liệu trả về* | *Giá trị mặc định* | *Mô tả* |
| 1 | card | CreditCard | NULL | Represent the card used for payment |
| 2 | interbank | InterbankInterface | NULL | Represent the Interbank subsystem |

***Operation***

|  |  |  |  |
| --- | --- | --- | --- |
| *#* | *Tên* | *Kiểu dữ liệu trả về* | *Mô tả (mục đích)* |
| 1 | payOrder | Map<String,String> | Thanh toán đơn hàng và trả về giao dịch thanh toán |

*Parameter:*

* amount – số tiền giao dịch
* contents – nội dung giao dịch
* cardNumber – số thẻ
* cardHolderName – tên chủ sở hữu
* expirationDate – ngày hết hạn theo định dạng "mm/yy"
* securityCode - mã bảo mật cvv/cvc

*Exception:*

* Không

***Method***

* getExpirationDate: Chuyển dữ liệu ngày từ định dạng “mm/yy” sang “mmyy”.

Diagram

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***State***

Không

1. Biểu đồ trạng thái (state machine) cho đối tượng “Order”

Diagram

Description automatically generated

* 1. **Biểu đồ lớp thiết kế**

Diagram

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1. **Mô hình hóa dữ liệu (Data Modeling)**
   1. **Mô hình khái niệm ( Conceptual Data Model)**

**AIMS System ERD**

Diagram

Description automatically generated

* 1. **Thiết kế cơ sở dữ liệu**

1. **Mô hình dữ liệu logic (Logical data model)**

Diagram

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1. **Mô hình dữ liệu vật lý (Physical data model)**

Chú thích:

PK: Primary Key

FK: Foreign Key

* **AnhNH-Media**

| # | PK | FK | Column Name | Data type | Mandatory | Description |
| --- | --- | --- | --- | --- | --- | --- |
|  | x |  | id | Integer | Yes | ID, auto increment |
|  |  |  | category | VARCHAR(45) | Yes | Media type, e.g., CD, DVD |
|  |  |  | price | Integer | Yes | Current price |
|  |  |  | quantity | Integer | Yes | Number of products |
|  |  |  | title | VARCHAR(45) | Yes | Product name |
|  |  |  | value | Integer | Yes | Value of the product |
|  |  |  | imageUrl | VARCHAR(45) | Yes | Product image path |

* **AnhNH-CD**

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

* **AnhNH-Book**

| # | PK | FK | Column Name | Data type | Mandatory | Description |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | x | id | Integer | Yes | ID, same as ID of Media of which type is Book |
|  |  |  | author | VARCHAR(45) | Yes | Author |
|  |  |  | coverType | VARCHAR(45) | Yes | Cover type |
|  |  |  | Publisher | VARCHAR(45) | Yes | Publishing house |
|  |  |  | publishDate | DATETIME | Yes | Date of publishing |
|  |  |  | numOfPages | Integer | Yes | Page number |
|  |  |  | language | VARCHAR(45) | Yes | Language |
|  |  |  | bookCategory | VARCHAR(45) | Yes | Book category |

* **AnhNH-DVD**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| # | PK | FK | Column Name | Data type | Mandatory | Description |
|  |  | x | id | Integer | Yes | ID, same as ID of Media of which type is DVD |
|  |  |  | discType | VARCHAR(45) | Yes | Disc type |
|  |  |  | director | VARCHAR(45) | Yes | Director |
|  |  |  | runtime | Integer | Yes | Duration |
|  |  |  | studio | VARCHAR(45) | Yes | Manufacturer |
|  |  |  | subtitle | VARCHAR(45) | Yes | Subtitles |
|  |  |  | releasedDate | DATETIME | Yes | Release date |
|  |  |  | filmType | VARCHAR(45) | Yes | Genres |

* **AnhNH-Card**

| # | PK | FK | Column Name | Data type | Mandatory | Description |
| --- | --- | --- | --- | --- | --- | --- |
|  | x |  | id | Integer | Yes | ID, auto increment |
|  |  |  | cardCode | VARCHAR(45) | Yes | Card code |
|  |  |  | owner | VARCHAR(45) | Yes | Cardholders |
|  |  |  | cvvCode | VARCHAR(3) | Yes | CVV code |
|  |  |  | dateExpired | VARCHAR(4) | Yes | Expiration date |

* **AnhNH-DeliveryInfo**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| # | PK | FK | Column Name | Data type | Mandatory | Description |
|  | X |  | id | Integer | Yes | ID, auto increment |
|  |  |  | name | VARCHAR(45) | Yes | Receiver name |
|  |  |  | province | VARCHAR(45) | Yes | Provinces |
|  |  |  | instructions | VARCHAR(200) | No | Delivery instructions |
|  |  |  | address | VARCHAR(100) | Yes | Delivery address |

* **AnhNH-Order**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| # | PK | FK | Column Name | Data type | Mandatory | Description |
|  | X |  | id | Integer | Yes | ID |
|  |  |  | shippingFees | VARCHAR(45) | Yes | Shipping fee |
|  |  | X | deliveryInfoId | Integer | Yes | Delivery Info ID |

* **AnhNH-OrderMedia**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| # | PK | FK | Column Name | Data type | Mandatory | Description |
|  |  | X | mediaID | Integer | Yes | Media ID |
|  |  | X | orderID | Integer | Yes | Order ID |
|  |  |  | price | Integer | Yes | Selling price |
|  |  |  | quantity | Integer | Yes | Number |

* **AnhNH-Invoice**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| # | PK | FK | Column Name | Data type | Mandatory | Description |
|  | x |  | id | Integer | Yes | ID |
|  |  |  | totalAmount | Integer | Yes | Total |
|  |  | x | orderId | Integer | Yes | Order ID |

* **AnhNH-PaymentTransaction**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| # | PK | FK | Column Name | Data type | Mandatory | Description |
|  | x |  | id | Integer | Yes | ID |
|  |  |  | createAt | DATETIME | Yes | Date of creation |
|  |  |  | content | VARCHAR(45) | Yes | Transaction contents |
|  |  |  | method | VARCHAR(45) | Yes | Payment methods |
|  |  | x | cardId | Integer | Yes | ID of used card |
|  |  | x | invoiceId | Integer | Yes | Invoice ID |

Database Script :

BEGIN;

CREATE TABLE "db"."AnhNH-Media"(

"id" INTEGER PRIMARY KEY AUTOINCREMENT 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 "db"."AnhNHCD"(

"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\_Media1"

FOREIGN KEY("id")

REFERENCES "Media"("id")

);

CREATE TABLE "db"."AnhNH-Book"(

"id" INTEGER PRIMARY KEY NOT NULL,

"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\_Media1"

FOREIGN KEY("id")

REFERENCES "Media"("id")

);

CREATE TABLE "db"."AnhNH-DeleveryInfo"(

"id" INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,

"name" VARCHAR(45),

"province" VARCHAR(45),

"instructions" VARCHAR(200),

"address" VARCHAR(100)

);

CREATE TABLE "db"."AnhNH-Card"(

"id" INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,

"cardCode" VARCHAR(15) NOT NULL,

"owner" VARCHAR(45) NOT NULL,

"cvvCode" VARCHAR(3) NOT NULL,

"dateExpired" VARCHAR(4) NOT NULL

);

CREATE TABLE "db"."AnhNH-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,

CONSTRAINT "fk\_DVD\_Media1"

FOREIGN KEY("id")

REFERENCES "Media"("id")

);

CREATE TABLE "db"."AnhNH-Order"(

"id" INTEGER NOT NULL,

"shippingFees" VARCHAR(45),

"deleveryInfoId" INTEGER NOT NULL,

PRIMARY KEY("id","deleveryInfoId"),

CONSTRAINT "fk\_Order\_DeleveryInfo1"

FOREIGN KEY("deleveryInfoId")

REFERENCES "DeleveryInfo"("id")

);

CREATE INDEX "db"."AnhNH-Order.fk\_Order\_DeleveryInfo1\_idx" ON "Order" ("deleveryInfoId");

CREATE TABLE "db"."AnhNH-OrderMedia"(

"orderID" INTEGER NOT NULL,

"price" INTEGER NOT NULL,

"quantity" INTEGER NOT NULL,

"mediaId" INTEGER NOT NULL,

PRIMARY KEY("orderID","mediaId"),

CONSTRAINT "fk\_ordermedia\_order"

FOREIGN KEY("orderID")

REFERENCES "Order"("id"),

CONSTRAINT "fk\_OrderMedia\_Media1"

FOREIGN KEY("mediaId")

REFERENCES "Media"("id")

);

CREATE INDEX "db"."AnhNH-OrderMedia.fk\_ordermedia\_order\_idx" ON "OrderMedia" ("orderID");

CREATE INDEX "db"."AnhNH-OrderMedia.fk\_OrderMedia\_Media1\_idx" ON "OrderMedia" ("mediaId");

CREATE TABLE "db"."AnhNH-Invoice"(

"id" INTEGER PRIMARY KEY NOT NULL,

"totalAmount" INTEGER NOT NULL,

"orderId" INTEGER NOT NULL,

CONSTRAINT "fk\_Invoice\_Order1"

FOREIGN KEY("orderId")

REFERENCES "Order"("id")

);

CREATE INDEX "db"."AnhNH-Invoice.fk\_Invoice\_Order1\_idx" ON "Invoice" ("orderId");

CREATE TABLE "db"."AnhNH-PaymentTransaction"(

"id" INTEGER NOT NULL,

"createAt" DATETIME NOT NULL,

"content" VARCHAR(45) NOT NULL,

"method" VARCHAR(45),

"cardId" INTEGER NOT NULL,

"invoiceId" INTEGER NOT NULL,

PRIMARY KEY("id","cardId","invoiceId"),

CONSTRAINT "fk\_PaymentTransaction\_Card1"

FOREIGN KEY("cardId")

REFERENCES "Card"("id"),

CONSTRAINT "fk\_PaymentTransaction\_Invoice1"

FOREIGN KEY("invoiceId")

REFERENCES "Invoice"("id")

);

CREATE INDEX "db"."AnhNH-PaymentTransaction.fk\_PaymentTransaction\_Card1\_idx" ON "PaymentTransaction" ("cardId");

CREATE INDEX "db"."AnhNH-PaymentTransaction.fk\_PaymentTransaction\_Invoice1\_idx" ON "PaymentTransaction" ("invoiceId");

COMMIT;

1. **Bài tập về nhà**
   1. **Mối quan hệ giữa các lớp thêm RushOrder**

Diagram

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* 1. **Lớp thiết kế**

Diagram

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***Attribute***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *#* | *Tên* | *Kiểu dữ liệu trả về* | *Giá trị mặc định* | *Mô tả* |
| 1 | supportRushOrder | boolean | false | Có support Rush order hay không |

***Operation***

|  |  |  |  |
| --- | --- | --- | --- |
| *#* | *Tên* | *Kiểu dữ liệu trả về* | *Mô tả (mục đích)* |
| 1 | isSupportedRushOrder | boolean | Trả về kết quả xem media đó có hỗ trợ giao hàng nhanh hay không ? |

*Exception:*

* Không
  1. **Mô hình dữ liệu vật lý (Physical data model)**

Chú thích:

PK: Primary Key

FK: Foreign Key

* **AnhNH-Media**

| # | PK | FK | Column Name | Data type | Mandatory | Description |
| --- | --- | --- | --- | --- | --- | --- |
|  | x |  | id | Integer | Yes | ID, auto increment |
|  |  |  | category | VARCHAR(45) | Yes | Media type, e.g., CD, DVD |
|  |  |  | price | Integer | Yes | Current price |
|  |  |  | quantity | Integer | Yes | Number of products |
|  |  |  | title | VARCHAR(45) | Yes | Product name |
|  |  |  | value | Integer | Yes | Value of the product |
|  |  |  | imageUrl | VARCHAR(45) | Yes | Product image path |
|  |  |  | supportRushOrder | BOOLEAN | Yes | Is support Rush Order |