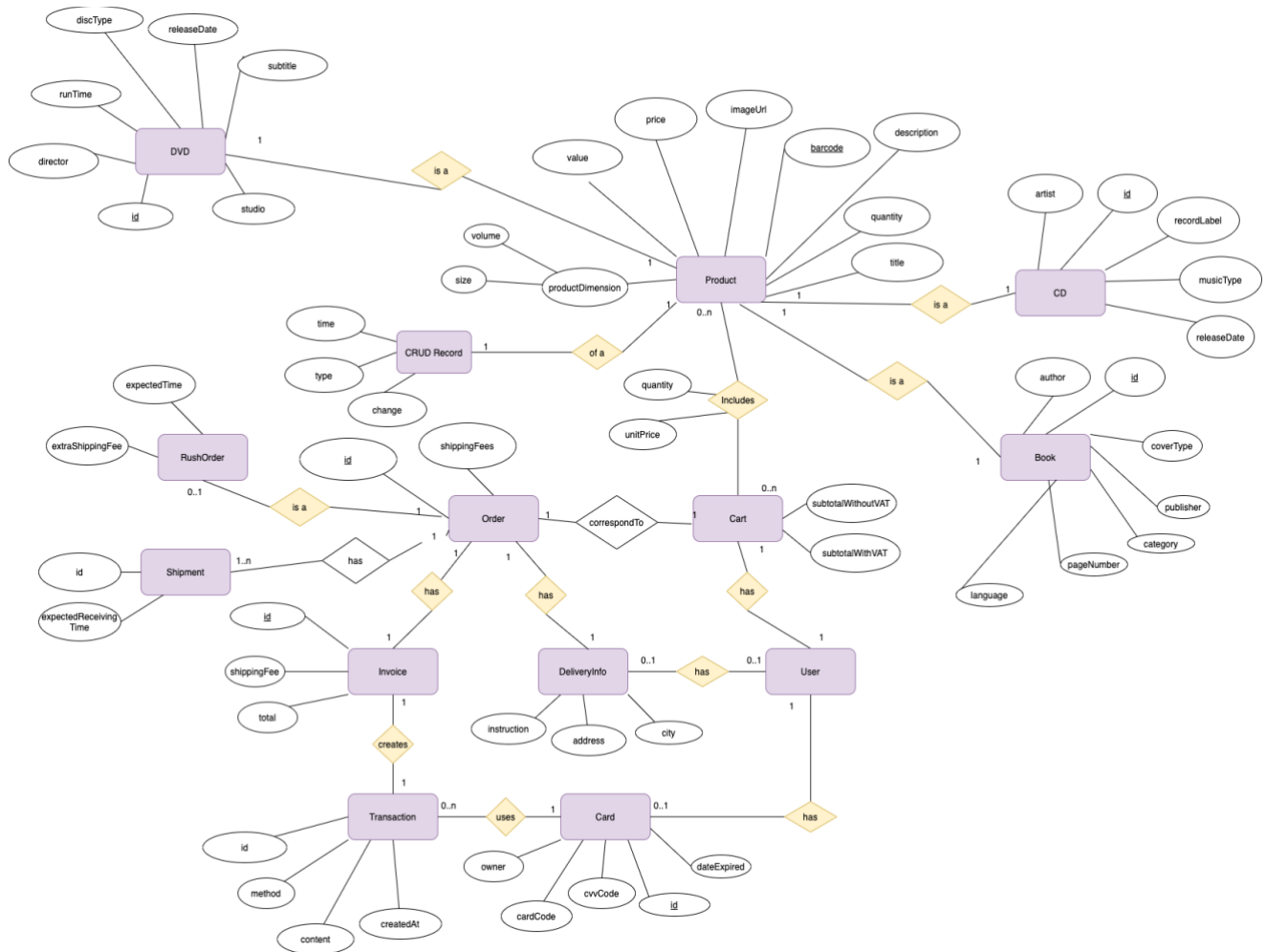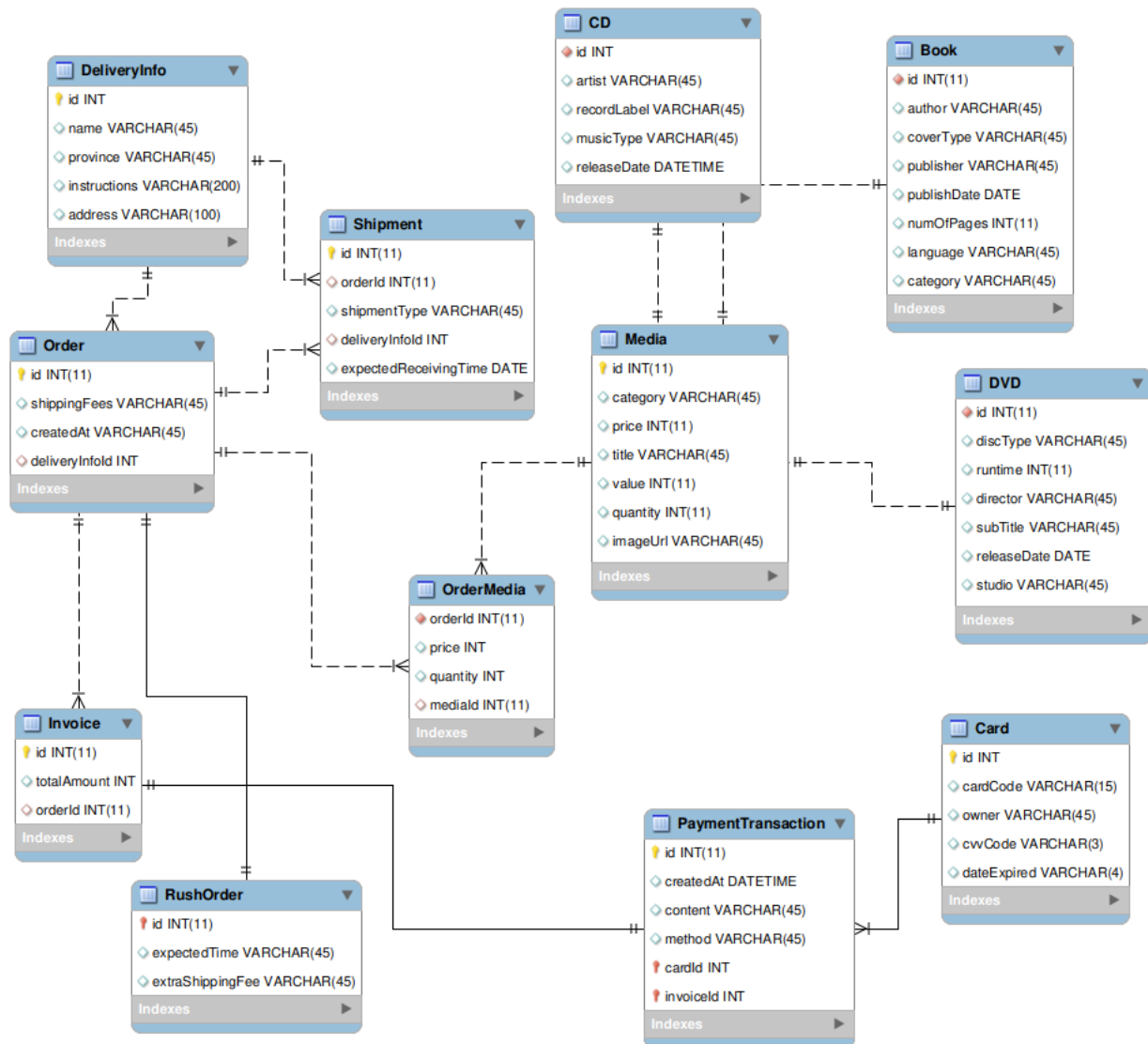# Lab 07: Data Modeling

1. Entity-Relationship Diagram

2. Logical Data Model

3. Physical Data Model

- **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., CD, DVD
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			supportRushOrder	Integer	Yes	To check if the media supports rush order or not

- **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

#	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.			cardCode	VARCHAR(45)	Yes	Card code
3.			owner	VARCHAR(45)	Yes	Cardholders
4.			cvvCode	VARCHAR(3)	Yes	CVV code
5.			dateExpired	VARCHAR(4)	Yes	Expiration date

- **DeliveryInfo**

#	PK	FK	Column Name	Data type	Mandatory	Description
1.	X		id	Integer	Yes	ID, auto increment
2.			name	VARCHAR(45)	Yes	Receiver name
3.			province	VARCHAR(45)	Yes	Provinces
4.			instructions	VARCHAR(200)	No	Delivery instructions
5.			address	VARCHAR(100)	Yes	Delivery address

- **Order**

#	PK	FK	Column Name	Data type	Mandatory	Description
1.	X		id	Integer	Yes	ID
2.			shippingFees	VARCHAR(45)	Yes	Shipping fee
3.		X	deliveryInfoId	Integer	Yes	Delivery Info ID
4			isRushOrder	Integer	Yes	Check if the order is a rush order or not

- **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

- **Invoice**

#	PK	FK	Column Name	Data type	Mandatory	Description
1.	x		id	Integer	Yes	ID
2.			totalAmount	Integer	Yes	Total
3.		x	orderId	Integer	Yes	Order ID

- **PaymentTransaction**

#	PK	FK	Column Name	Data type	Mandatory	Description
1.	x		id	Integer	Yes	ID
2.			createAt	DATETIME	Yes	Date of creation
3.			content	VARCHAR(45)	Yes	Transaction contents

#	PK	FK	Column Name	Data type	Mandatory	Description
4.			method	VARCHAR(45)	Yes	Payment methods
5.		x	cardId	Integer	Yes	ID of used card
6.		x	invoiceId	Integer	Yes	Invoice ID

- **RushOrder**

#	PK	FK	Column Name	Data type	Mandatory	Description
1.		x	id	Integer	Yes	ID
2.			expected ReceivingTime	DATE	Yes	Time to expect receiving rush order
3.			extraShippingFee	VARCHAR(45)	Yes	Extra shipping fee for rush order

- **Shipment**

#	PK	FK	Column Name	Data type	Mandatory	Description
1.	x		id	Integer	Yes	ID
2.			expected ReceivingTime	DATE	No	Time to expect receiving rush order
3.		x	orderId	INT(11)	Yes	The order that shipment belongs to
4.		x	deliveryInfoId	INT(11)	Yes	The delivery information of the shipment
5.			shipmentType	VARCHAR(45)	Yes	The type of the shipment

```
-- MySQL Script generated by MySQL Workbench

-- Thứ ba, 16 Tháng 11 Năm 2021 13:17:25 +07

-- Model: New Model    Version: 1.0

-- MySQL Workbench Forward Engineering


SET @OLD_UNIQUE_CHECKS=@@UNIQUE_CHECKS, UNIQUE_CHECKS=0;

SET @OLD_FOREIGN_KEY_CHECKS=@@FOREIGN_KEY_CHECKS, FOREIGN_KEY_CHECKS=0;

SET @OLD_SQL_MODE=@@SQL_MODE,

SQL_MODE='ONLY_FULL_GROUP_BY,STRICT_TRANS_TABLES,NO_ZERO_IN_DATE,NO_ZERO_DATE,ERROR_FOR_DIVISI
ON_BY_ZERO,NO_ENGINE_SUBSTITUTION';


-- -----------------------------------------------
```

```sql
-- Schema mydb
-- -----------------------------------------------------

-- -----------------------------------------------------
-- Schema mydb
-- -----------------------------------------------------
CREATE SCHEMA IF NOT EXISTS `mydb` DEFAULT CHARACTER SET utf8 ;
USE `mydb` ;

-- -----------------------------------------------------
-- Table `mydb`.`DeliveryInfo`
-- -----------------------------------------------------
CREATE TABLE IF NOT EXISTS `mydb`.`DeliveryInfo` (
  `id` INT NOT NULL,
  `name` VARCHAR(45) NULL,
  `province` VARCHAR(45) NULL,
  `instructions` VARCHAR(200) NULL COMMENT '\n',
  `address` VARCHAR(100) NULL,
  PRIMARY KEY (`id`))
ENGINE = InnoDB;


-- -----------------------------------------------------
-- Table `mydb`.`Media`
-- -----------------------------------------------------
CREATE TABLE IF NOT EXISTS `mydb`.`Media` (
  `id` INT(11) NOT NULL,
  `category` VARCHAR(45) NULL,
  `price` INT(11) NULL,
  `title` VARCHAR(45) NULL DEFAULT CURRENT_TIMESTAMP,
  `value` INT(11) NULL,
  `quantity` INT(11) NULL,
  `imageUrl` VARCHAR(45) NULL,
  PRIMARY KEY (`id`))
ENGINE = InnoDB;


-- -----------------------------------------------------
-- Table `mydb`.`CD`
-- -----------------------------------------------------
CREATE TABLE IF NOT EXISTS `mydb`.`CD` (
  `id` INT NOT NULL,
  `artist` VARCHAR(45) NULL,
  `recordLabel` VARCHAR(45) NULL,
```

```sql
  `musicType` VARCHAR(45) NULL DEFAULT CURRENT_TIMESTAMP,
  `releaseDate` DATETIME NULL,
  INDEX `fk_CD_1_idx` (`id` ASC) VISIBLE,
  CONSTRAINT `fk_CD_1`
    FOREIGN KEY (`id`)
    REFERENCES `mydb`.`Media` (`id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
ENGINE = InnoDB;


-- -----------------------------------------------------
-- Table `mydb`.`Book`
-- -----------------------------------------------------
CREATE TABLE IF NOT EXISTS `mydb`.`Book` (
  `id` INT(11) NOT NULL,
  `author` VARCHAR(45) NULL,
  `coverType` VARCHAR(45) NULL,
  `publisher` VARCHAR(45) NULL,
  `publishDate` DATE NULL,
  `numOfPages` INT(11) NULL,
  `language` VARCHAR(45) NULL,
  `category` VARCHAR(45) NULL,
  INDEX `fk_Book_1_idx` (`id` ASC) VISIBLE,
  CONSTRAINT `fk_Book_1`
    FOREIGN KEY (`id`)
    REFERENCES `mydb`.`Media` (`id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
ENGINE = InnoDB;


-- -----------------------------------------------------
-- Table `mydb`.`Order`
-- -----------------------------------------------------
CREATE TABLE IF NOT EXISTS `mydb`.`Order` (
  `id` INT(11) NOT NULL,
  `shippingFees` VARCHAR(45) NULL,
  `createdAt` VARCHAR(45) NULL,
  `deliveryInfoId` INT NULL,
  PRIMARY KEY (`id`),
  INDEX `fk_Order_1_idx` (`deliveryInfoId` ASC) VISIBLE,
  CONSTRAINT `fk_Order_1`
    FOREIGN KEY (`deliveryInfoId`)
```

```sql
    REFERENCES `mydb`.`DeliveryInfo` (`id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
ENGINE = InnoDB;


-- -----------------------------------------------------
-- Table `mydb`.`DVD`
-- -----------------------------------------------------
CREATE TABLE IF NOT EXISTS `mydb`.`DVD` (
  `id` INT(11) NOT NULL,
  `discType` VARCHAR(45) NULL,
  `runtime` INT(11) NULL,
  `director` VARCHAR(45) NULL DEFAULT CURRENT_TIMESTAMP,
  `subTitle` VARCHAR(45) NULL,
  `releaseDate` DATE NULL,
  `studio` VARCHAR(45) NULL,
  UNIQUE INDEX `id_UNIQUE` (`id` ASC),
  CONSTRAINT `fk_DVD_1`
    FOREIGN KEY (`id`)
    REFERENCES `mydb`.`Media` (`id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
ENGINE = InnoDB;


-- -----------------------------------------------------
-- Table `mydb`.`Invoice`
-- -----------------------------------------------------
CREATE TABLE IF NOT EXISTS `mydb`.`Invoice` (
  `id` INT(11) NOT NULL,
  `totalAmount` INT NULL,
  `orderId` INT(11) NULL,
  PRIMARY KEY (`id`),
  INDEX `fk_Invoice_1_idx` (`orderId` ASC) VISIBLE,
  CONSTRAINT `fk_Invoice_1`
    FOREIGN KEY (`orderId`)
    REFERENCES `mydb`.`Order` (`id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
ENGINE = InnoDB;


-- -----------------------------------------------------
-- Table `mydb`.`OrderMedia`
```

```sql
-- -------------------------------------------------
CREATE TABLE IF NOT EXISTS `mydb`.`OrderMedia` (
  `orderId` INT(11) NOT NULL,
  `price` INT NULL,
  `quantity` INT NULL,
  `mediaId` INT(11) NULL,
  INDEX `index1` () VISIBLE,
  INDEX `fk_OrderMedia_2_idx` (`mediaId` ASC) VISIBLE,
  INDEX `fk_OrderMedia_1_idx` (`orderId` ASC) VISIBLE,
  CONSTRAINT `fk_OrderMedia_1`
    FOREIGN KEY (`orderId`)
    REFERENCES `mydb`.`Order` (`id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `fk_OrderMedia_2`
    FOREIGN KEY (`mediaId`)
    REFERENCES `mydb`.`Media` (`id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
ENGINE = InnoDB;


-- -------------------------------------------------
-- Table `mydb`.`Card`
-- -------------------------------------------------
CREATE TABLE IF NOT EXISTS `mydb`.`Card` (
  `id` INT NOT NULL,
  `cardCode` VARCHAR(15) NULL,
  `owner` VARCHAR(45) NULL,
  `cvvCode` VARCHAR(3) NULL,
  `dateExpired` VARCHAR(4) NULL,
  PRIMARY KEY (`id`))
ENGINE = InnoDB;


-- -------------------------------------------------
-- Table `mydb`.`PaymentTransaction`
-- -------------------------------------------------
CREATE TABLE IF NOT EXISTS `mydb`.`PaymentTransaction` (
  `id` INT(11) NOT NULL,
  `createdAt` DATETIME NULL,
  `content` VARCHAR(45) NULL,
  `method` VARCHAR(45) NULL,
  `cardId` INT NOT NULL,
```

```sql
  `invoiceId` INT NOT NULL,
  PRIMARY KEY (`id`, `cardId`, `invoiceId`),
  INDEX `fk_PaymentTransaction_1_idx` (`invoiceId` ASC) VISIBLE,
  INDEX `fk_PaymentTransaction_2_idx` (`cardId` ASC) VISIBLE,
  CONSTRAINT `fk_PaymentTransaction_1`
    FOREIGN KEY (`invoiceId`)
    REFERENCES `mydb`.`Invoice` (`id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `fk_PaymentTransaction_2`
    FOREIGN KEY (`cardId`)
    REFERENCES `mydb`.`Card` (`id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
ENGINE = InnoDB;


-- -----------------------------------------------
-- Table `mydb`.`RushOrder`
-- -----------------------------------------------
CREATE TABLE IF NOT EXISTS `mydb`.`RushOrder` (
  `id` INT(11) NOT NULL,
  `expectedTime` VARCHAR(45) NULL,
  `extraShippingFee` VARCHAR(45) NULL,
  INDEX `fk_RushOrder_1_idx` (`id` ASC) VISIBLE,
  PRIMARY KEY (`id`),
  CONSTRAINT `fk_RushOrder_1`
    FOREIGN KEY (`id`)
    REFERENCES `mydb`.`Order` (`id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
ENGINE = InnoDB;


-- -----------------------------------------------
-- Table `mydb`.`Shipment`
-- -----------------------------------------------
CREATE TABLE IF NOT EXISTS `mydb`.`Shipment` (
  `id` INT(11) NOT NULL,
  `orderId` INT(11) NULL,
  `shipmentType` VARCHAR(45) NULL,
  `deliveryInfoId` INT NULL,
  `expectedReceivingTime` DATE NULL,
  PRIMARY KEY (`id`),
```

```sql
  INDEX `fk_Shipment_1_idx` (`orderId` ASC) VISIBLE,
  INDEX `fk_Shipment_2_idx` (`deliveryInfoId` ASC) VISIBLE,
  CONSTRAINT `fk_Shipment_1`
    FOREIGN KEY (`orderId`)
    REFERENCES `mydb`.`Order` (`id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `fk_Shipment_2`
    FOREIGN KEY (`deliveryInfoId`)
    REFERENCES `mydb`.`DeliveryInfo` (`id`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
ENGINE = InnoDB;


SET SQL_MODE=@OLD_SQL_MODE;
SET FOREIGN_KEY_CHECKS=@OLD_FOREIGN_KEY_CHECKS;
SET UNIQUE_CHECKS=@OLD_UNIQUE_CHECKS;
```