# DATABASE: LAB3

ID	NAME
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1) Steps :

a- Use the data modeler module in the Workbench from File and then New Model from the menu

b- Create a new schema; call it SAMPLE43.

c- Add the needed tables, for each table add the needed columns, primary keys and their foreign keys

d- Draw the ERD for by selecting Model and then Create Diagram from Catalog Objects.

e- Generate the database tables in the schema and the creation DDL scripts by selecting Database and then Forward Engineer from the menu to open the Forward Engineer to Database wizard.

f- Connect to the database and verify the creation of tables.

g- Save the generated scripts to your hard disk.

h- Disconnect from the database.

2) ERD :
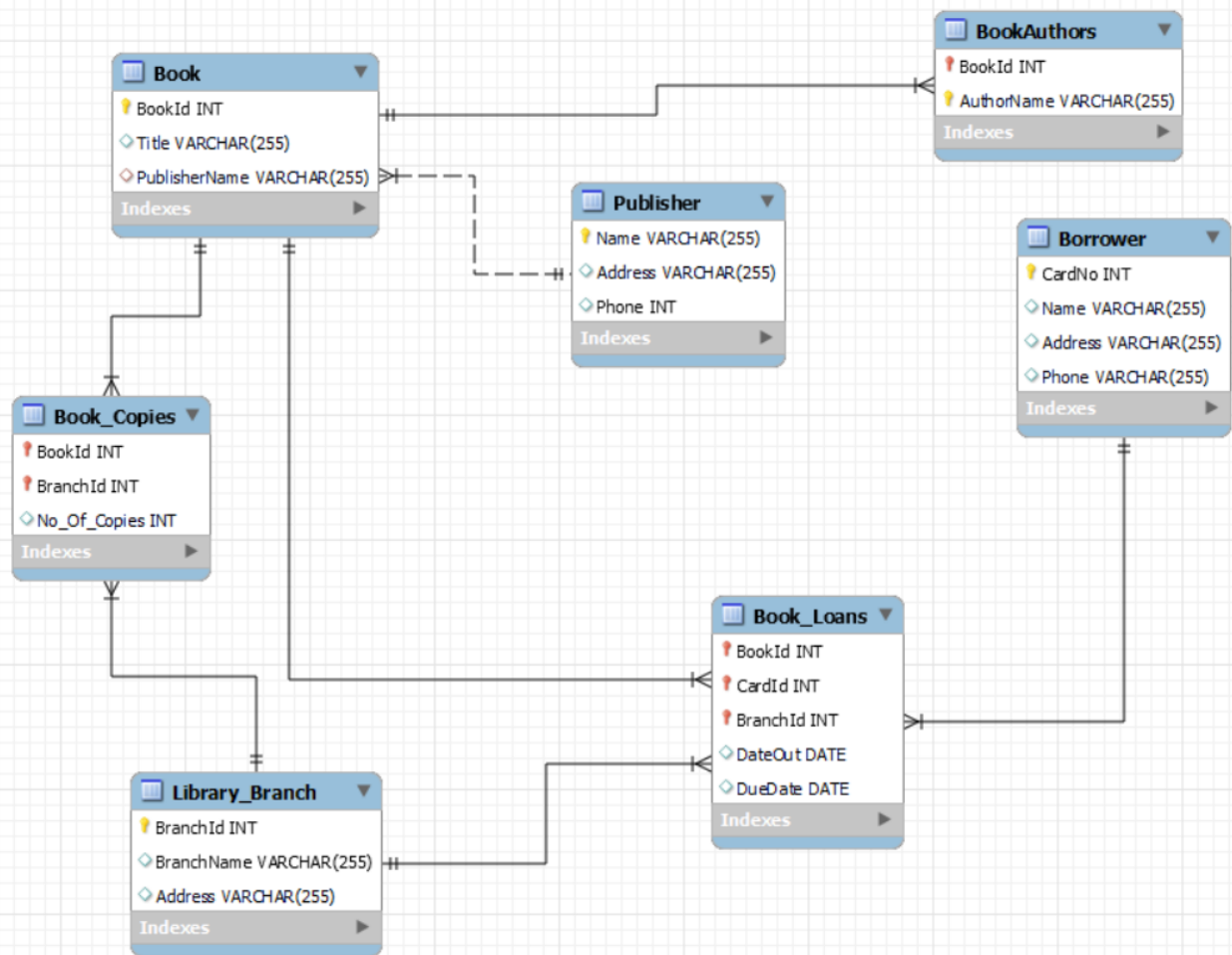
3) <u>DDL Scripts :</u>

```
-- 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_DA
TE,ERROR_FOR_DIVISION_BY_ZERO,NO_ENGINE_SUBSTITUTION';


-- -----------------------------------------------------
-- Schema SAMPLE43
-- -----------------------------------------------------


-- -----------------------------------------------------
-- Schema SAMPLE43
-- -----------------------------------------------------
CREATE SCHEMA IF NOT EXISTS `SAMPLE43` DEFAULT CHARACTER SET utf8 ;
USE `SAMPLE43` ;


-- -----------------------------------------------------
-- Table `SAMPLE43`.`Publisher`
-- -----------------------------------------------------
CREATE TABLE IF NOT EXISTS `SAMPLE43`.`Publisher` (
  `Name` VARCHAR(255) NOT NULL,
  `Address` VARCHAR(255) NULL,
  `Phone` INT NULL,
  PRIMARY KEY (`Name`))
ENGINE = InnoDB;



-- -----------------------------------------------------
-- Table `SAMPLE43`.`Book`
-- -----------------------------------------------------
CREATE TABLE IF NOT EXISTS `SAMPLE43`.`Book` (
  `BookId` INT NOT NULL,
  `Title` VARCHAR(255) NULL,
  `PublisherName` VARCHAR(255) NULL,
```

```sql
  PRIMARY KEY (`BookId`),
  INDEX `PublisherName_idx` (`PublisherName` ASC) VISIBLE,
  CONSTRAINT `BPublisherName`
    FOREIGN KEY (`PublisherName`)
    REFERENCES `SAMPLE43`.`Publisher` (`Name`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
ENGINE = InnoDB;




-- -----------------------------------------------------
-- Table `SAMPLE43`.`BookAuthors`
-- -----------------------------------------------------
CREATE TABLE IF NOT EXISTS `SAMPLE43`.`BookAuthors` (
  `BookId` INT NOT NULL,
  `AuthorName` VARCHAR(255) NOT NULL,
  PRIMARY KEY (`BookId`, `AuthorName`),
  CONSTRAINT `BABookId`
    FOREIGN KEY (`BookId`)
    REFERENCES `SAMPLE43`.`Book` (`BookId`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
ENGINE = InnoDB;




-- -----------------------------------------------------
-- Table `SAMPLE43`.`Library_Branch`
-- -----------------------------------------------------
CREATE TABLE IF NOT EXISTS `SAMPLE43`.`Library_Branch` (
  `BranchId` INT NOT NULL,
  `BranchName` VARCHAR(255) NULL,
  `Address` VARCHAR(255) NULL,
  PRIMARY KEY (`BranchId`))
ENGINE = InnoDB;




-- -----------------------------------------------------
-- Table `SAMPLE43`.`Book_Copies`
```

```sql
-- -------------------------------------------------------
CREATE TABLE IF NOT EXISTS `SAMPLE43`.`Book_Copies` (
  `BookId` INT NOT NULL,
  `BranchId` INT NOT NULL,
  `No_Of_Copies` INT NULL,
  PRIMARY KEY (`BookId`, `BranchId`),
  INDEX `BranchId_idx` (`BranchId` ASC) VISIBLE,
  CONSTRAINT `BCBookId`
    FOREIGN KEY (`BookId`)
    REFERENCES `SAMPLE43`.`Book` (`BookId`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `BCBranchId`
    FOREIGN KEY (`BranchId`)
    REFERENCES `SAMPLE43`.`Library_Branch` (`BranchId`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
ENGINE = InnoDB;


-- -------------------------------------------------------
-- Table `SAMPLE43`.`Borrower`
-- -------------------------------------------------------
CREATE TABLE IF NOT EXISTS `SAMPLE43`.`Borrower` (
  `CardNo` INT NOT NULL,
  `Name` VARCHAR(255) NULL,
  `Address` VARCHAR(255) NULL,
  `Phone` VARCHAR(255) NULL,
  PRIMARY KEY (`CardNo`))
ENGINE = InnoDB;


-- -------------------------------------------------------
-- Table `SAMPLE43`.`Book_Loans`
-- -------------------------------------------------------
CREATE TABLE IF NOT EXISTS `SAMPLE43`.`Book_Loans` (
  `BookId` INT NOT NULL,
  `CardId` INT NOT NULL,
```

```sql
  `BranchId` INT NOT NULL,
  `DateOut` DATE NULL,
  `DueDate` DATE NULL,
  PRIMARY KEY (`BookId`, `CardId`, `BranchId`),
  INDEX `BLCardId_idx` (`CardId` ASC) VISIBLE,
  INDEX `BLBranchId_idx` (`BranchId` ASC) VISIBLE,
  CONSTRAINT `BLCardId`
    FOREIGN KEY (`CardId`)
    REFERENCES `SAMPLE43`.`Borrower` (`CardNo`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `BLBranchId`
    FOREIGN KEY (`BranchId`)
    REFERENCES `SAMPLE43`.`Library_Branch` (`BranchId`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `BLBookId`
    FOREIGN KEY (`BookId`)
    REFERENCES `SAMPLE43`.`Book` (`BookId`)
    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;
```
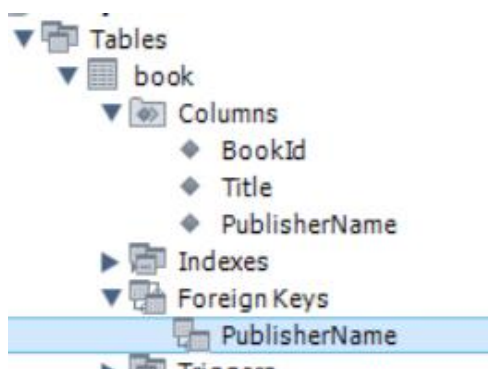
4) Created Tables :
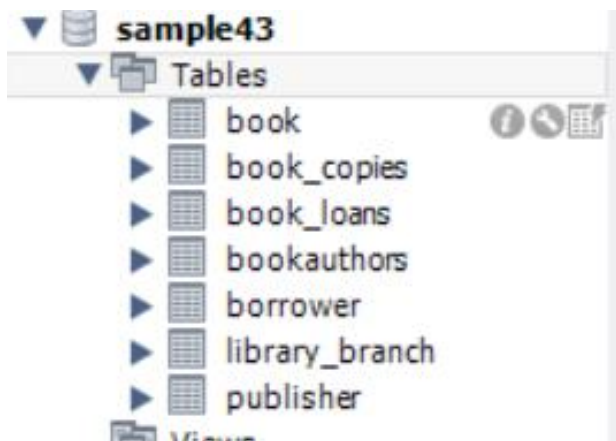
a) Book :

Table: book

Columns:
BookId	int PK
Title	varchar(255)
PublisherName	varchar(255)

Related Tables:
Target	publisher (PublisherName → Name)
On Update	RESTRICT
On Delete	RESTRICT

b) Book_copies:
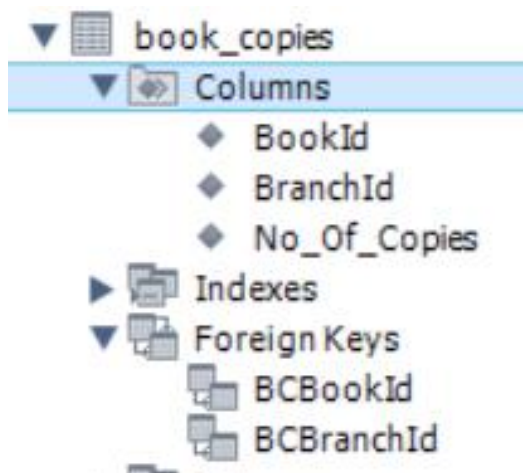
Table: book_copies

Columns:
BookId	int PK
BranchId	int PK
No_Of_Copies	int

Related Tables:
Target	book (BookId → BookId)
On Update	RESTRICT
On Delete	RESTRICT
Target	library_branch (BranchId → BranchId)
On Update	RESTRICT
On Delete	RESTRICT

c) Book_loans:
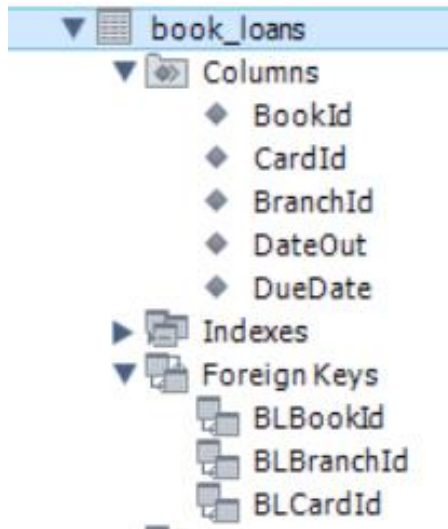
```
▼ ▦ book_loans                Table: book_loans
   ▼ ⬢ Columns
      ◆ BookId                 Columns:
      ◆ CardId                   BookId    int PK
      ◆ BranchId                 CardId    int PK
      ◆ DateOut                  BranchId  int PK
      ◆ DueDate                  DateOut   date
   ▶ ▤ Indexes                   DueDate   date
   ▼ ▦ Foreign Keys
      ▦ BLBookId             Related Tables:
      ▦ BLBranchId             Target      book (BookId → BookId)
      ▦ BLCardId               On Update   RESTRICT
                               On Delete   RESTRICT
                               Target      library_branch (BranchId → BranchId)
                               On Update   RESTRICT
                               On Delete   RESTRICT
                               Target      borrower (CardId → CardNo)
                               On Update   RESTRICT
                               On Delete   RESTRICT
```
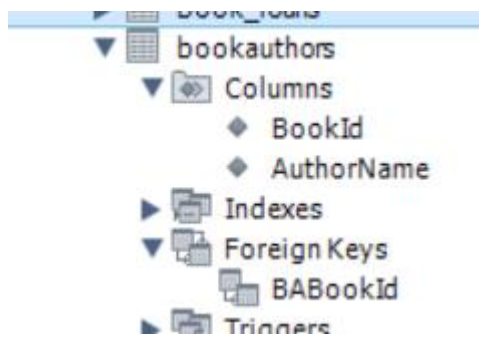
d) bookauthors :

```
▶ ▤ book_loans
   ▼ ▦ bookauthors          Table: bookauthors
      ▼ ⬢ Columns
         ◆ BookId           Columns:
         ◆ AuthorName         BookId      int PK
      ▶ ▤ Indexes            AuthorName  varchar(255) PK
      ▼ ▦ Foreign Keys
         ▦ BABookId        Related Tables:
      ▶ ▤ Triggers            Target      book (BookId → BookId)
                              On Update   RESTRICT
                              On Delete   RESTRICT
```
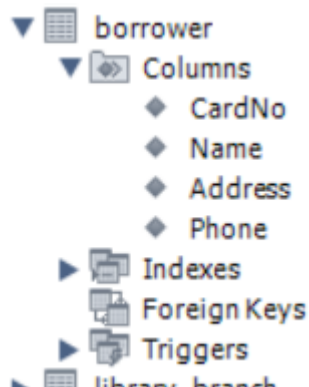
e) borrower :

```
▼ ▦ borrower
   ▼ ⬢ Columns              Table: borrower
      ◆ CardNo
      ◆ Name                Columns:
      ◆ Address               CardNo   int PK
      ◆ Phone                 Name     varchar(255)
   ▶ ▤ Indexes                Address  varchar(255)
   ▦ Foreign Keys             Phone    varchar(255)
   ▶ ▦ Triggers
   ▶ ▦ library_branch
```

f) <u>library branch :</u>

g) <u>publisher :</u>

5) <u>Links :</u>

a) Model and EER :

https://drive.google.com/file/d/1AfLeVUr4qpIEXjh61XkbgkxxeTAquYD0/view?usp=sharing
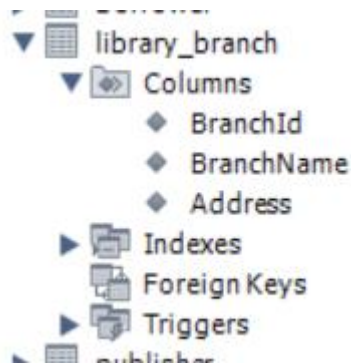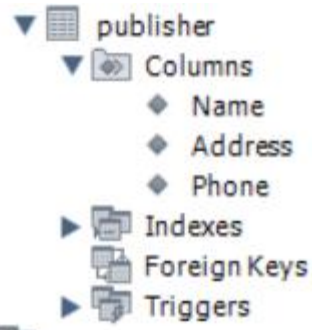
b) DDL Script generated by Model :

https://drive.google.com/file/d/1cbCD4JwvDhQKMzycGGi-IUEgsbiP5O9p/view?usp=sharing