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CIS 552: Database Design – Homework 1 – Part 2

# ER Schema using Data Modeler Tool

In this section, we crafted an Entity-Relationship (ER) schema for the UNIVERSITY database. This practical exercise has real-world applications as it involves taking client-side ER diagrams and transforming them into a schema that accurately represents the business logic and definition for use in back-end systems. Through this process, we gained knowledge of how to model an ER schema from an ER diagram using industry-standard tools and how to generate code that will be utilized to create the physical database design in implementation. The data modeler tool I have used id MySQL workbench.

Diagram

Description automatically generated

# SQL

-- MySQL Script generated by MySQL Workbench  
-- Sat Feb 4 22:24:24 2023  
-- 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\_DIVISION\_BY\_ZERO,NO\_ENGINE\_SUBSTITUTION';  
  
-- -----------------------------------------------------  
-- Schema mydb  
-- -----------------------------------------------------  
  
-- -----------------------------------------------------  
-- Schema mydb  
-- -----------------------------------------------------  
**CREATE** **SCHEMA** **IF** **NOT** **EXISTS** `mydb` **DEFAULT** CHARACTER **SET** utf8 ;  
**USE** `mydb` ;  
  
-- -----------------------------------------------------  
-- Table `mydb`.`DEPT`  
-- -----------------------------------------------------  
**CREATE** **TABLE** **IF** **NOT** **EXISTS** `mydb`.`DEPT` (  
 `DCode` INT **NOT** NULL,  
 `DName` VARCHAR(45) **NOT** NULL,  
 `DOffice` VARCHAR(45) NULL,  
 `DPhone` INT NULL,  
 `CollegeName` VARCHAR(45) **NOT** NULL,  
 `Chair` INT **NOT** NULL,  
 `CStartDate` DATETIME NULL,  
 PRIMARY **KEY** (`DCode`, `CollegeName`, `DName`, `Chair`),  
 **INDEX** `fk\_DEPT\_COLLEGE1\_idx` (`CollegeName` **ASC**),  
 **INDEX** `fk\_DEPT\_INSTRUCTOR1\_idx` (`Chair` **ASC**),  
 **CONSTRAINT** `fk\_DEPT\_COLLEGE1`  
 **FOREIGN** **KEY** (`CollegeName`)  
 **REFERENCES** `mydb`.`COLLEGE` (`CName`)  
 **ON** **DELETE** **NO** **ACTION**  
 **ON** **UPDATE** **NO** **ACTION**,  
 **CONSTRAINT** `fk\_DEPT\_INSTRUCTOR1`  
 **FOREIGN** **KEY** (`Chair`)  
 **REFERENCES** `mydb`.`INSTRUCTOR` (`Id`)  
 **ON** **DELETE** **NO** **ACTION**  
 **ON** **UPDATE** **NO** **ACTION**)  
**ENGINE** = **InnoDB**;  
  
  
-- -----------------------------------------------------  
-- Table `mydb`.`INSTRUCTOR`  
-- -----------------------------------------------------  
**CREATE** **TABLE** **IF** **NOT** **EXISTS** `mydb`.`INSTRUCTOR` (  
 `Id` INT **NOT** NULL,  
 `IName` VARCHAR(45) **NOT** NULL,  
 `IOffice` VARCHAR(45) NULL,  
 `IPhone` INT NULL,  
 `Rank` INT NULL,  
 `DepartmentCode` INT **NOT** NULL,  
 `CName` VARCHAR(45) **NOT** NULL,  
 PRIMARY **KEY** (`Id`, `DepartmentCode`, `CName`),  
 **INDEX** `fk\_INSTRUCTOR\_COLLEGE\_idx` (`CName` **ASC**),  
 **INDEX** `fk\_INSTRUCTOR\_DEPT1\_idx` (`DepartmentCode` **ASC**),  
 **CONSTRAINT** `fk\_INSTRUCTOR\_COLLEGE`  
 **FOREIGN** **KEY** (`CName`)  
 **REFERENCES** `mydb`.`COLLEGE` (`CName`)  
 **ON** **DELETE** **NO** **ACTION**  
 **ON** **UPDATE** **NO** **ACTION**,  
 **CONSTRAINT** `fk\_INSTRUCTOR\_DEPT1`  
 **FOREIGN** **KEY** (`DepartmentCode`)  
 **REFERENCES** `mydb`.`DEPT` (`DCode`)  
 **ON** **DELETE** **NO** **ACTION**  
 **ON** **UPDATE** **NO** **ACTION**)  
**ENGINE** = **InnoDB**;  
  
  
-- -----------------------------------------------------  
-- Table `mydb`.`COLLEGE`  
-- -----------------------------------------------------  
**CREATE** **TABLE** **IF** **NOT** **EXISTS** `mydb`.`COLLEGE` (  
 `CName` VARCHAR(45) **NOT** NULL,  
 `COffice` VARCHAR(45) NULL,  
 `CPhone` INT NULL,  
 `DeanId` INT NULL,  
 PRIMARY **KEY** (`CName`),  
 **INDEX** `fk\_COLLEGE\_INSTRUCTOR1\_idx` (`DeanId` **ASC**),  
 **CONSTRAINT** `fk\_COLLEGE\_INSTRUCTOR1`  
 **FOREIGN** **KEY** (`DeanId`)  
 **REFERENCES** `mydb`.`INSTRUCTOR` (`Id`)  
 **ON** **DELETE** **NO** **ACTION**  
 **ON** **UPDATE** **NO** **ACTION**)  
**ENGINE** = **InnoDB**;  
  
  
-- -----------------------------------------------------  
-- Table `mydb`.`STUDENT`  
-- -----------------------------------------------------  
**CREATE** **TABLE** **IF** **NOT** **EXISTS** `mydb`.`STUDENT` (  
 `SId` INT **NOT** NULL,  
 `FName` VARCHAR(45) **NOT** NULL,  
 `MName` VARCHAR(45) **NOT** NULL,  
 `LName` VARCHAR(45) **NOT** NULL,  
 `DOB` DATETIME **NOT** NULL,  
 `Addr` VARCHAR(100) **NOT** NULL,  
 `Phone` INT NULL,  
 `Major` VARCHAR(60) NULL,  
 `DepartmentId` INT **NOT** NULL,  
 PRIMARY **KEY** (`SId`, `DepartmentId`),  
 **INDEX** `fk\_STUDENT\_DEPT1\_idx` (`DepartmentId` **ASC**),  
 **CONSTRAINT** `fk\_STUDENT\_DEPT1`  
 **FOREIGN** **KEY** (`DepartmentId`)  
 **REFERENCES** `mydb`.`DEPT` (`DCode`)  
 **ON** **DELETE** **NO** **ACTION**  
 **ON** **UPDATE** **NO** **ACTION**)  
**ENGINE** = **InnoDB**;  
  
  
-- -----------------------------------------------------  
-- Table `mydb`.`COURSE`  
-- -----------------------------------------------------  
**CREATE** **TABLE** **IF** **NOT** **EXISTS** `mydb`.`COURSE` (  
 `CCode` INT **NOT** NULL,  
 `CoName` VARCHAR(45) **NOT** NULL,  
 `Credits` INT NULL,  
 `Level` INT NULL,  
 `CDesc` TEXT(1024) NULL,  
 `DepartmentId` INT **NOT** NULL,  
 PRIMARY **KEY** (`CCode`, `DepartmentId`),  
 **INDEX** `fk\_COURSE\_DEPT1\_idx` (`DepartmentId` **ASC**),  
 **CONSTRAINT** `fk\_COURSE\_DEPT1`  
 **FOREIGN** **KEY** (`DepartmentId`)  
 **REFERENCES** `mydb`.`DEPT` (`DCode`)  
 **ON** **DELETE** **NO** **ACTION**  
 **ON** **UPDATE** **NO** **ACTION**)  
**ENGINE** = **InnoDB**;  
  
  
-- -----------------------------------------------------  
-- Table `mydb`.`SECTION`  
-- -----------------------------------------------------  
**CREATE** **TABLE** **IF** **NOT** **EXISTS** `mydb`.`SECTION` (  
 `Secld` INT **NOT** NULL,  
 `SecNo` INT NULL,  
 `Sem` INT NULL,  
 `Year` VARCHAR(45) NULL,  
 `CRoom` VARCHAR(45) NULL,  
 `DaysTime` DATETIME NULL,  
 `InstructorId` INT **NOT** NULL,  
 `CourceId` INT **NOT** NULL,  
 PRIMARY **KEY** (`Secld`, `CourceId`, `InstructorId`),  
 **INDEX** `fk\_SECTION\_INSTRUCTOR1\_idx` (`InstructorId` **ASC**),  
 **INDEX** `fk\_SECTION\_COURSE1\_idx` (`CourceId` **ASC**),  
 **CONSTRAINT** `fk\_SECTION\_INSTRUCTOR1`  
 **FOREIGN** **KEY** (`InstructorId`)  
 **REFERENCES** `mydb`.`INSTRUCTOR` (`Id`)  
 **ON** **DELETE** **NO** **ACTION**  
 **ON** **UPDATE** **NO** **ACTION**,  
 **CONSTRAINT** `fk\_SECTION\_COURSE1`  
 **FOREIGN** **KEY** (`CourceId`)  
 **REFERENCES** `mydb`.`COURSE` (`CCode`)  
 **ON** **DELETE** **NO** **ACTION**  
 **ON** **UPDATE** **NO** **ACTION**)  
**ENGINE** = **InnoDB**;  
  
  
-- -----------------------------------------------------  
-- Table `mydb`.`GRADE`  
-- -----------------------------------------------------  
**CREATE** **TABLE** **IF** **NOT** **EXISTS** `mydb`.`GRADE` (  
 `id` INT **NOT** NULL,  
 `StudentId` INT **NOT** NULL,  
 `SectionId` INT **NOT** NULL,  
 `grade` VARCHAR(45) **NOT** NULL,  
 PRIMARY **KEY** (`id`, `SectionId`, `StudentId`),  
 **INDEX** `fk\_STUDENT\_SECTION\_STUDENT1\_idx` (`StudentId` **ASC**),  
 **INDEX** `fk\_STUDENT\_SECTION\_SECTION1\_idx` (`SectionId` **ASC**),  
 **CONSTRAINT** `fk\_STUDENT\_SECTION\_STUDENT1`  
 **FOREIGN** **KEY** (`StudentId`)  
 **REFERENCES** `mydb`.`STUDENT` (`SId`)  
 **ON** **DELETE** **NO** **ACTION**  
 **ON** **UPDATE** **NO** **ACTION**,  
 **CONSTRAINT** `fk\_STUDENT\_SECTION\_SECTION1`  
 **FOREIGN** **KEY** (`SectionId`)  
 **REFERENCES** `mydb`.`SECTION` (`Secld`)  
 **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;