**МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ**

**НАЦІОНАЛЬНОМУ УНІВЕРСИТЕТІ “ЛЬВІВСЬКА**

**ПОЛІТЕХНІКА”**

**Кафедра систем штучного інтелекту**



**Лабораторна робота #2**

**на тему:**

**«Cтворення таблиць бази даних засобами SQL»**

з дисципліни

«Організація баз даних та знань»

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Львів – 2020 р.

Мета роботи: Побудувати даталогічну модель бази даних; визначити типи, розмірності та обмеження полів; визначити обмеження таблиць; розробити SQL запити для створення спроектованих таблиць.

Хід роботи:

1. Скрипт створення бази даних:

-- ---------------------------------------------------

-- Set flexible strict configuration

-- ---------------------------------------------------

SET @OLD\_UNIQUE\_CHECKS=@@UNIQUE\_CHECKS, UNIQUE\_CHECKS=0;

-- Avoid checks if values unique

SET @OLD\_FOREIGN\_KEY\_CHECKS=@@FOREIGN\_KEY\_CHECKS, FOREIGN\_KEY\_CHECKS=0;

-- Avoid checks of foreign keys relations

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';

-- Set mode to Strict (to dates, group selects, zero deletions, engine errors)

-- -----------------------------------------------------

-- Schema mydb

-- -----------------------------------------------------

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

-- Create schema with utf8MB3 character encoding

USE `mydb` ;

-- -----------------------------------------------------

-- Table `mydb`.`office`

-- -----------------------------------------------------

CREATE TABLE IF NOT EXISTS `mydb`.`office` (

-- Create table command

`id` INT NOT NULL AUTO\_INCREMENT,

-- Create an generated id field

`name` VARCHAR(45) NOT NULL,

`address` VARCHAR(45) NOT NULL,

`phone` VARCHAR(45) NOT NULL,

`UGREOU code` INT NOT NULL,

PRIMARY KEY (`id`),

-- Set id as primary key

UNIQUE INDEX `office\_id\_UNIQUE` (`id` ASC) VISIBLE,

UNIQUE INDEX `UGREOU code\_UNIQUE` (`UGREOU code` ASC) VISIBLE)

-- Set id and UGREOU code as unique indexes sorted by ASC and VISIBLE.

ENGINE = InnoDB;

-- Set engine to InnoDB

-- -----------------------------------------------------

-- Table `mydb`.`worker`

-- -----------------------------------------------------

CREATE TABLE IF NOT EXISTS `mydb`.`worker` (

`id` INT NOT NULL AUTO\_INCREMENT,

`dateOfBirth` DATETIME NOT NULL,

`name` VARCHAR(45) NOT NULL,

`surname` VARCHAR(45) NOT NULL,

`address` VARCHAR(45) NOT NULL,

`office\_id` INT NOT NULL,

UNIQUE INDEX `id\_UNIQUE` (`id` ASC) VISIBLE,

PRIMARY KEY (`id`),

INDEX `fk\_worker\_office1\_idx` (`office\_id` ASC) VISIBLE,

CONSTRAINT `fk\_worker\_office1`

FOREIGN KEY (`office\_id`)

-- Set foreign field as foreign key

REFERENCES `mydb`.`office` (`id`)

-- Set referenced table of this FK

ON DELETE NO ACTION

ON UPDATE NO ACTION);

-- Do no action in case of parent object deletion or update

ENGINE = InnoDB

-- -----------------------------------------------------

-- Table `mydb`.`dealer`

-- -----------------------------------------------------

CREATE TABLE IF NOT EXISTS `mydb`.`dealer` (

`id` INT NOT NULL AUTO\_INCREMENT,

`name` VARCHAR(45) NOT NULL,

`address` VARCHAR(45) NOT NULL,

`phone` VARCHAR(45) NOT NULL,

PRIMARY KEY (`id`),

UNIQUE INDEX `dealer\_id\_UNIQUE` (`id` ASC) VISIBLE)

ENGINE = InnoDB;

-- -----------------------------------------------------

-- Table `mydb`.`goods`

-- -----------------------------------------------------

CREATE TABLE IF NOT EXISTS `mydb`.`goods` (

`id` INT NOT NULL AUTO\_INCREMENT,

`name` VARCHAR(45) NOT NULL,

`price` FLOAT NOT NULL,

`dealer\_id` INT NOT NULL,

`office\_id` INT NOT NULL,

PRIMARY KEY (`id`),

UNIQUE INDEX `goods\_id\_UNIQUE` (`id` ASC) VISIBLE,

INDEX `fk\_goods\_dealer1\_idx` (`dealer\_id` ASC) VISIBLE,

INDEX `fk\_goods\_office1\_idx` (`office\_id` ASC) VISIBLE,

CONSTRAINT `fk\_goods\_dealer1`

FOREIGN KEY (`dealer\_id`)

REFERENCES `mydb`.`dealer` (`id`)

ON DELETE NO ACTION

ON UPDATE NO ACTION,

CONSTRAINT `fk\_goods\_office1`

FOREIGN KEY (`office\_id`)

REFERENCES `mydb`.`office` (`id`)

ON DELETE NO ACTION

ON UPDATE NO ACTION)

ENGINE = InnoDB;

-- -----------------------------------------------------

-- Table `mydb`.`client`

-- -----------------------------------------------------

CREATE TABLE IF NOT EXISTS `mydb`.`client` (

`id` INT NOT NULL AUTO\_INCREMENT,

`name` VARCHAR(45) NOT NULL,

`surname` VARCHAR(45) NOT NULL,

`phone` VARCHAR(45) NOT NULL,

PRIMARY KEY (`id`),

UNIQUE INDEX `id\_UNIQUE` (`id` ASC) VISIBLE)

ENGINE = InnoDB;

-- -----------------------------------------------------

-- Table `mydb`.`service`

-- -----------------------------------------------------

CREATE TABLE IF NOT EXISTS `mydb`.`service` (

`id` INT NOT NULL AUTO\_INCREMENT,

`name` VARCHAR(45) NOT NULL,

`price` VARCHAR(45) NOT NULL,

PRIMARY KEY (`id`),

UNIQUE INDEX `id\_UNIQUE` (`id` ASC) VISIBLE)

ENGINE = InnoDB;

-- -----------------------------------------------------

-- Table `mydb`.`order`

-- -----------------------------------------------------

CREATE TABLE IF NOT EXISTS `mydb`.`order` (

`id` INT NOT NULL AUTO\_INCREMENT,

`start\_date` DATETIME NOT NULL,

`expire\_date` DATETIME NOT NULL,

`client\_id` INT NOT NULL,

`service\_id` INT NOT NULL,

PRIMARY KEY (`id`),

INDEX `fk\_service\_client1\_idx` (`client\_id` ASC) VISIBLE,

INDEX `fk\_service\_available\_services1\_idx` (`service\_id` ASC) VISIBLE,

UNIQUE INDEX `id\_UNIQUE` (`id` ASC) VISIBLE,

CONSTRAINT `fk\_service\_client1`

FOREIGN KEY (`client\_id`)

REFERENCES `mydb`.`client` (`id`)

ON DELETE NO ACTION

ON UPDATE NO ACTION,

CONSTRAINT `fk\_service\_available\_services1`

FOREIGN KEY (`service\_id`)

REFERENCES `mydb`.`service` (`id`)

ON DELETE NO ACTION

ON UPDATE NO ACTION)

ENGINE = InnoDB;

-- -----------------------------------------------------

-- Table `mydb`.`personal\_tool`

-- -----------------------------------------------------

CREATE TABLE IF NOT EXISTS `mydb`.`personal\_tool` (

`id` INT NOT NULL AUTO\_INCREMENT,

`name` VARCHAR(45) NOT NULL,

`serial\_number` VARCHAR(45) NOT NULL,

`worker\_id` INT NOT NULL,

PRIMARY KEY (`id`),

INDEX `fk\_personal\_toolkit\_worker1\_idx` (`worker\_id` ASC) VISIBLE,

UNIQUE INDEX `id\_UNIQUE` (`id` ASC) VISIBLE,

CONSTRAINT `fk\_personal\_toolkit\_worker1`

FOREIGN KEY (`worker\_id`)

REFERENCES `mydb`.`worker` (`id`)

ON DELETE NO ACTION

ON UPDATE NO ACTION)

ENGINE = InnoDB;

-- -----------------------------------------------------

-- Table `mydb`.`worker\_on\_service`

-- -----------------------------------------------------

CREATE TABLE IF NOT EXISTS `mydb`.`worker\_on\_service` (

`id` INT NOT NULL AUTO\_INCREMENT,

`worker\_id` INT NOT NULL,

`service\_id` INT NOT NULL,

PRIMARY KEY (`id`),

INDEX `fk\_worker\_has\_service\_service1\_idx` (`service\_id` ASC) VISIBLE,

INDEX `fk\_worker\_has\_service\_worker1\_idx` (`worker\_id` ASC) VISIBLE,

UNIQUE INDEX `id\_UNIQUE` (`id` ASC) VISIBLE,

CONSTRAINT `fk\_worker\_has\_service\_worker1`

FOREIGN KEY (`worker\_id`)

REFERENCES `mydb`.`worker` (`id`)

ON DELETE NO ACTION

ON UPDATE NO ACTION,

CONSTRAINT `fk\_worker\_has\_service\_service1`

FOREIGN KEY (`service\_id`)

REFERENCES `mydb`.`order` (`id`)

ON DELETE NO ACTION

ON UPDATE NO ACTION);

ENGINE = InnoDB

-- -----------------------------------------------------

-- Table `mydb`.`purchase`

-- -----------------------------------------------------

CREATE TABLE IF NOT EXISTS `mydb`.`purchase` (

`id` INT NOT NULL AUTO\_INCREMENT,

`client\_id` INT NOT NULL,

`goods\_id` INT NOT NULL,

`Date` DATETIME NOT NULL,

PRIMARY KEY (`id`),

INDEX `fk\_client\_has\_goods\_goods1\_idx` (`goods\_id` ASC) VISIBLE,

INDEX `fk\_client\_has\_goods\_client1\_idx` (`client\_id` ASC) VISIBLE,

UNIQUE INDEX `id\_UNIQUE` (`id` ASC) VISIBLE,

CONSTRAINT `fk\_client\_has\_goods\_client1`

FOREIGN KEY (`client\_id`)

REFERENCES `mydb`.`client` (`id`)

ON DELETE NO ACTION

ON UPDATE NO ACTION,

CONSTRAINT `fk\_client\_has\_goods\_goods1`

FOREIGN KEY (`goods\_id`)

REFERENCES `mydb`.`goods` (`id`)

ON DELETE NO ACTION

ON UPDATE NO ACTION)

ENGINE = InnoDB;

-- -----------------------------------------------------

-- Table `mydb`.`replaced\_part`

-- -----------------------------------------------------

CREATE TABLE IF NOT EXISTS `mydb`.`replaced\_part` (

`id` INT NOT NULL AUTO\_INCREMENT,

`worker\_on\_service\_id` INT NOT NULL,

`goods\_id` INT NOT NULL,

INDEX `fk\_service\_idx` (`worker\_on\_service\_id` ASC) VISIBLE,

PRIMARY KEY (`id`),

UNIQUE INDEX `id\_UNIQUE` (`id` ASC) VISIBLE,

INDEX `fk\_goods\_idx` (`goods\_id` ASC) VISIBLE,

CONSTRAINT `fk\_goods`

FOREIGN KEY (`goods\_id`)

REFERENCES `mydb`.`goods` (`id`)

ON DELETE NO ACTION

ON UPDATE NO ACTION,

CONSTRAINT `fk\_service`

FOREIGN KEY (`worker\_on\_service\_id`)

REFERENCES `mydb`.`worker\_on\_service` (`id`)

ON DELETE NO ACTION

ON UPDATE NO ACTION);

-- -----------------------------------------

-- Return to default configuration

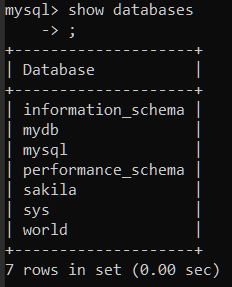
-- -----------------------------------------

SET SQL\_MODE=@OLD\_SQL\_MODE;

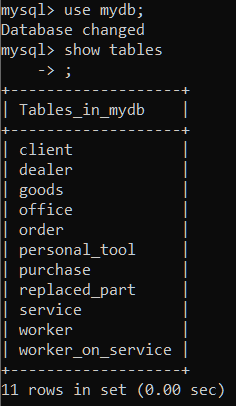
SET FOREIGN\_KEY\_CHECKS=@OLD\_FOREIGN\_KEY\_CHECKS;

SET UNIQUE\_CHECKS=@OLD\_UNIQUE\_CHECKS;

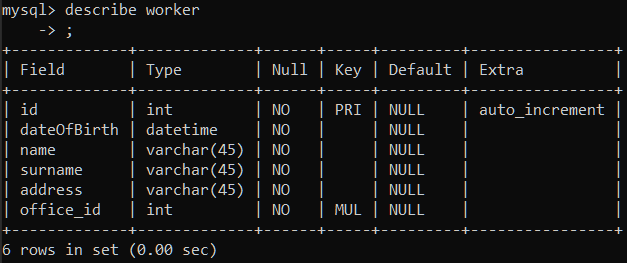
1. **Продемонструвати створену скриптом базу даних.**



(Тут наявні бази даних згенеровані при встановленні MySQL)



(Це всі 11 таблиць бази даних)



(Жодне поле не дозволяє значень NULL, але значень за замовчуванням не задано)

**Висновок:**

Виконуючи цю лабораторну роботу, я завершив моделювання бази даних з 11 таблиць та навчився з нею взаємодіяти.