CSC430/530 – Database Management Systems

Lab 0 – Creating & populating the database.

**Part A – Creating DB and tables, defining domains of attributes & entity integrity constraints (primary keys).**

Create database and define schemas for every relation (table).

* First, open phpMyAdmin and click on "SQL".
* To create the database named “company”, put the following in the SQL editor:

CREATE DATABASE company;

* Click the "Go" button to run the query (or press ctrl+enter).
* Click on the created "company" database in the left panel (if using command line, this is the same as entering: use company;
* Next, create a schema and define domain & entity integrity constraints for every relation.
* In the SQL editor for the company database:
  + Employee relation:

DROP TABLE IF EXISTS employee;

CREATE TABLE employee (

fname VARCHAR(15) NOT NULL,

minit CHAR,

lname VARCHAR(15) NOT NULL,

ssn VARCHAR(9) NOT NULL,

bdate DATE,

address VARCHAR(50),

sex CHAR,

salary DECIMAL(10,2) CHECK (salary > 0),

super\_ssn VARCHAR(9),

dno INTEGER DEFAULT 1,

CONSTRAINT emp\_pk PRIMARY KEY (ssn)

);

* + Dependent relation:

DROP TABLE IF EXISTS dependent;

CREATE TABLE dependent (

essn VARCHAR(9) NOT NULL,

dependent\_name VARCHAR(15) NOT NULL,

sex CHAR,

bdate DATE, relationship VARCHAR(8),

CONSTRAINT dependent\_pk PRIMARY KEY (essn,dependent\_name)

);

* + Department relation:

DROP TABLE IF EXISTS department;

CREATE TABLE department (

dname VARCHAR(25) NOT NULL,

dnumber INTEGER NOT NULL,

mgr\_ssn VARCHAR(9),

mgr\_start\_date DATE,

CONSTRAINT dept\_pk PRIMARY KEY (dnumber),

CONSTRAINT dept\_unique UNIQUE (dname)

);

* + Department locations relation:

DROP TABLE IF EXISTS dept\_locations;

CREATE TABLE dept\_locations (

dnumber INTEGER NOT NULL,

dlocation VARCHAR(15) NOT NULL,

CONSTRAINT dept\_loc\_pk PRIMARY KEY (dnumber, dlocation)

);

* + Project relation:

DROP TABLE IF EXISTS project;

CREATE TABLE project (

pname VARCHAR(25) NOT NULL,

pnumber INTEGER NOT NULL,

plocation VARCHAR(15),

dnum INTEGER,

CONSTRAINT project\_pk PRIMARY KEY (pnumber),

CONSTRAINT project\_unique UNIQUE (pname)

);

* + Works on relation:

DROP TABLE IF EXISTS works\_on;

CREATE TABLE works\_on (

essn VARCHAR(9) NOT NULL,

pno INTEGER NOT NULL,

hours DECIMAL(4,1),

CONSTRAINT works\_on\_pk PRIMARY KEY (essn,pno)

);

**Part B – Defining referential integrity constraints.**

Once the schemas with domain and entity integrity constraints are defined, we can define referential integrity constraints (foreign keys).

* In SQL query editor:
  + Employee relation:

ALTER TABLE employee

ADD CONSTRAINT emp\_super\_fk

FOREIGN KEY (super\_ssn) REFERENCES employee(ssn)

ON DELETE SET NULL

ON UPDATE CASCADE,

ADD CONSTRAINT emp\_dept\_fk

FOREIGN KEY (Dno) REFERENCES department(dnumber)

ON DELETE SET NULL

ON UPDATE CASCADE;

* + Dependent relation:

ALTER TABLE dependent

ADD CONSTRAINT dependent\_fk

FOREIGN KEY (essn) REFERENCES employee(ssn)

ON DELETE RESTRICT

ON UPDATE CASCADE;

* + Department relation:

ALTER TABLE department

ADD CONSTRAINT dept\_mgr\_fk

FOREIGN KEY (mgr\_ssn) REFERENCES employee(ssn)

ON DELETE SET NULL

ON UPDATE CASCADE;

* + Department locations relation:

ALTER TABLE dept\_locations

ADD CONSTRAINT dept\_loc\_fk

FOREIGN KEY (dnumber) REFERENCES department(dnumber)

ON DELETE RESTRICT

ON UPDATE CASCADE;

* + Project relation:

ALTER TABLE project

ADD CONSTRAINT project\_fk

FOREIGN KEY (dnum) REFERENCES department(dnumber)

ON DELETE RESTRICT

ON UPDATE CASCADE;

* + Works on relation:

ALTER TABLE works\_on

ADD CONSTRAINT works\_on\_ssn\_fk

FOREIGN KEY (essn) REFERENCES employee(ssn)

ON DELETE RESTRICT

ON UPDATE CASCADE,

ADD CONSTRAINT works\_on\_pno\_fk

FOREIGN KEY (pno) REFERENCES project(pnumber)

ON DELETE RESTRICT

ON UPDATE CASCADE;

**Part C – Populating the DB.**

Parts A & B conclude the definition of the database schema. Next step is to create database state, i.e. populate the database with data.

Database can be populated in three ways:

* Manually, using INSERT DML command.
* Through “Import” (at the top navigation after selecting a table). Accepts data in multiple formats.
* Dump data through command line (shell), using LOAD DATA INFILE command. Accepts data in any text file format.

We will use the import option. Do the following for each table:

* Click on a table in the database
* Go to the Import page (click on "Import" at the top).
* Under "File to import", click on "Choose File" and find the .dat file for that table. These files can be found on Canvas in a zip file for Lab 0.
* Scroll down to "Other options" and uncheck "Enable foreign key checks".
* Change the "Format" to "CSV".
* Click "Import" button at the bottom.
* Repeat this for all 6 tables.