Session 1 reflection

1. Describe in writing the transactions you wish to be able to carry out (insertions, eliminations, retrievals of information).

I will create a database with 3 tables at the beginning and for this reflection a I will be using insertion for hiring new employees, purchasing new equipment or opening new departments, elimination for termination of employees, scrap equipment and closing departments, will also retrieve information per department or per employee

2. Identify the entities involved in all of these transactions.

I will create a database of employees containing – name, company email, employee ID, departments, usernames and assigned equipment.

3. Identify the attributes of each entity and point out which one to choose as key.

E1 Employees – Employee ID – PK, First Name, Last Name, company email, username, Department ID – FK

E2 Departments – Department ID – PK, Department name

E3 Equipment – Equipment ID and Serial Number - PK, Type of Equipment and Employee ID - FK

4. Sketch an ER diagram indicating all your entities and the presence of relationships, naming each relationship.

Graphical user interface, text, application

Description automatically generated

5. Indicate the specific pluralities of each relation in the ER diagram.

Employees to Departments – many:1 relationship. 1 employee can be part of one department, but 1 department can have many employees

Employees to Equipment is 1:many relationship. 1 Employee can have different equipment assigned to them.

6. Describe the table structures needed for the proposed ER diagram.

Table Employees will have 1 PK, the employee ID and 1 FK that is the Department ID. It will also contain the First Name, Last name, Email and Username of the Employee

Table Departments will have two attributes – Department ID, that is the PK and the Department name

Table Equipment will have four attributes – Equipment ID and Serial Number that together will be the PK, the type of equipment (monitor, pc, laptop, headset) and a foreign key that is the Employee ID

7. Identify the data type and any applicable restrictions to each attribute, including whether it may take on null values.

Table Employees

+Employee ID – SMALLINT UNSIGNED (always positive)

+First Name – VARCHAR(20) – with 20 characters, NULL

+Last Name – VARCHAR(20) – with 20 characters, NULL

+Company Email – VARCHAR(30) – with 30 characters, NULL

+Username – VARCHAR(20) – with 20 characters, NULL

+Department ID - SMALLINT UNSIGNED (always positive)

Table Departments

+Department ID - SMALLINT UNSIGNED (always positive)

+Department Name - VARCHAR(20) – with 20 characters, NULL

Table Equipment

+Equipment ID – SMALLINT UNSIGNED (always positive)

+Serial Number – VARCHAR(30) – with 30 characters, NULL

+Type of Equipment – VARCHAR(20) – with 20 characters, NULL

+Employee ID – SMALLINT UNSIGNED (always positive)

8. In SQLite notation, tested either in Replit or Colab, create the corresponding tables.

CREATE TABLE Employees

(employee\_id SMALLINT UNSIGNED AUTO\_INCREMENT,

fname VARCHAR(20),

lname VARCHAR(20),

company\_email VARCHAR(30),

username VARCHAR(20),

department\_id SMALLINT,

CONSTRAINT pk\_employees PRIMARY KEY (employee\_id),

CONSTRAINT fk\_employees\_departments FOREIGN KEY (department\_id)

REFERENCES Departments (department\_id));

CREATE TABLE Departments

(department\_id SMALLINT UNSIGNED AUTO\_INCREMENT,

dname VARCHAR(20),

CONSTRAINT pk\_departments PRIMARY KEY (department\_id));

CREATE TABLE Equipment

(equipment\_id SMALLINT UNSIGNED AUTO\_INCREMENT,

serial\_number VARCHAR(30),

equipment\_type VARCHAR(20),

employee\_id SMALLINT,

CONSTRAINT pk\_equipment PRIMARY KEY (equipment\_id, serial\_number),

CONSTRAINT fk\_equipment\_employees FOREIGN KEY (employee\_id)

REFERENCES Employees (employment\_id));

9. Add some (manually defined or pseudo-randomly generated) data into each table, respecting the ER diagram you designed.

INSERT INTO Employees

(employee\_id, fname, lname, company\_email, username)

VALUES (1, 'Bill', 'Turner', 'butrner@suns.com', 'CC\_Bill');

INSERT INTO Employees

(employee\_id, fname, lname, company\_email, username)

VALUES (2, 'Sarah', 'Conor', 'sconor@suns.com', 'CC\_Sarah');

INSERT INTO Departments

(department\_id, dname)

VALUES (1, 'Call Center');

INSERT INTO Departments

(department\_id, dname)

VALUES (2, 'Dispatch');

INSERT INTO Equipment

(equipment\_id, serial\_number, equipment\_type, employee\_id)

VALUES (1, '45RN345', 'Monitor', 1);

INSERT INTO Equipment

(equipment\_id, serial\_number, equipment\_type, employee\_id)

VALUES (2, 'RTEU658', 'PC', 1);

INSERT INTO Equipment

(equipment\_id, serial\_number, equipment\_type, employee\_id)

VALUES (3, '98BNK19', 'Monitor', 2);

INSERT INTO Equipment

(equipment\_id, serial\_number, equipment\_type, employee\_id)

VALUES (4, '234YTRU7', 'PC', 2);

SELECT \* FROM Employees;

SELECT \* FROM Departments;

SELECT \* FROM Equipment WHERE equipment\_type = 'Monitor';

DELETE FROM Equipment WHERE serial\_number = '45RN345';

SELECT \* FROM Equipment WHERE equipment\_type = 'Monitor';