

Autonomous University of Zacatecas

ACADEMIC UNIT OF ELECTRICAL ENGINEERING

ACADEMIC PROGRAM OF SOFTWARE ENGINEERING



DATABASE SYSTEMS LABORATORY II PRACTICE 1 -
REVIEW OF DATABASE SYSTEMS I

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1 Introduction

Entity-relationship model is the most powerful tool in the database environment. By means of it, each problem statement is modeled and subsequently converted into its equivalent relational model. The final stage is to reach a complete and functional database schema that reflects the problem statement in a reliable way.

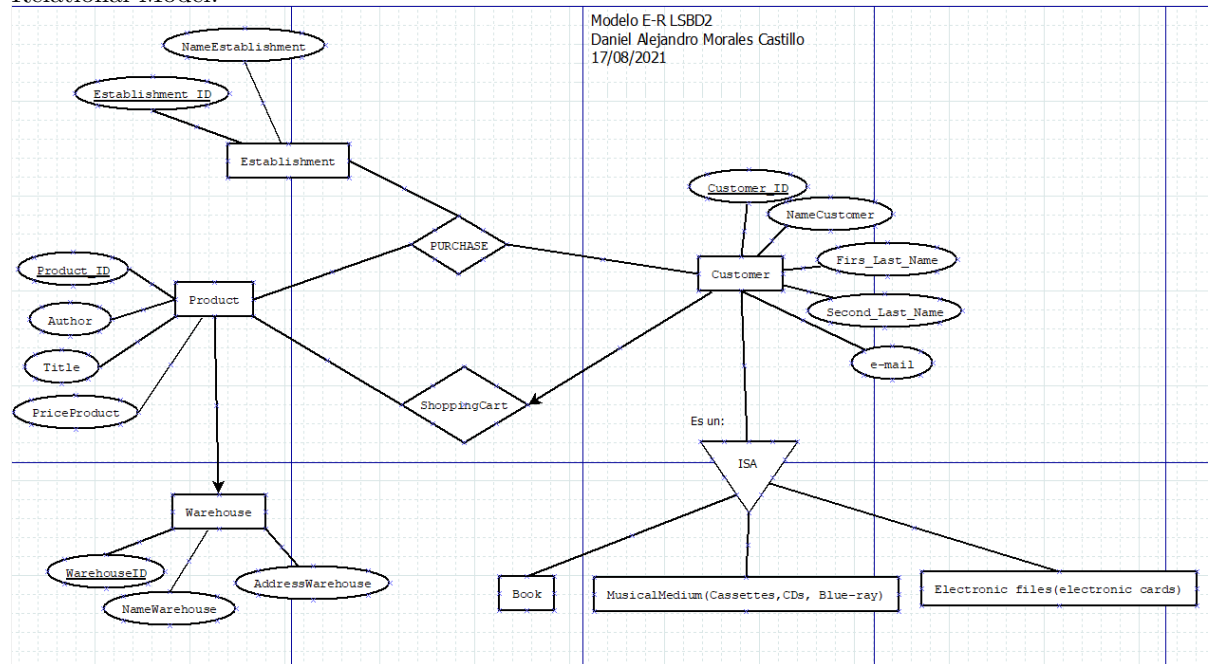
In this practice we will solve some activities with these entity relationship models, to reach the resolution of the different scenarios raised

2 Activity 1

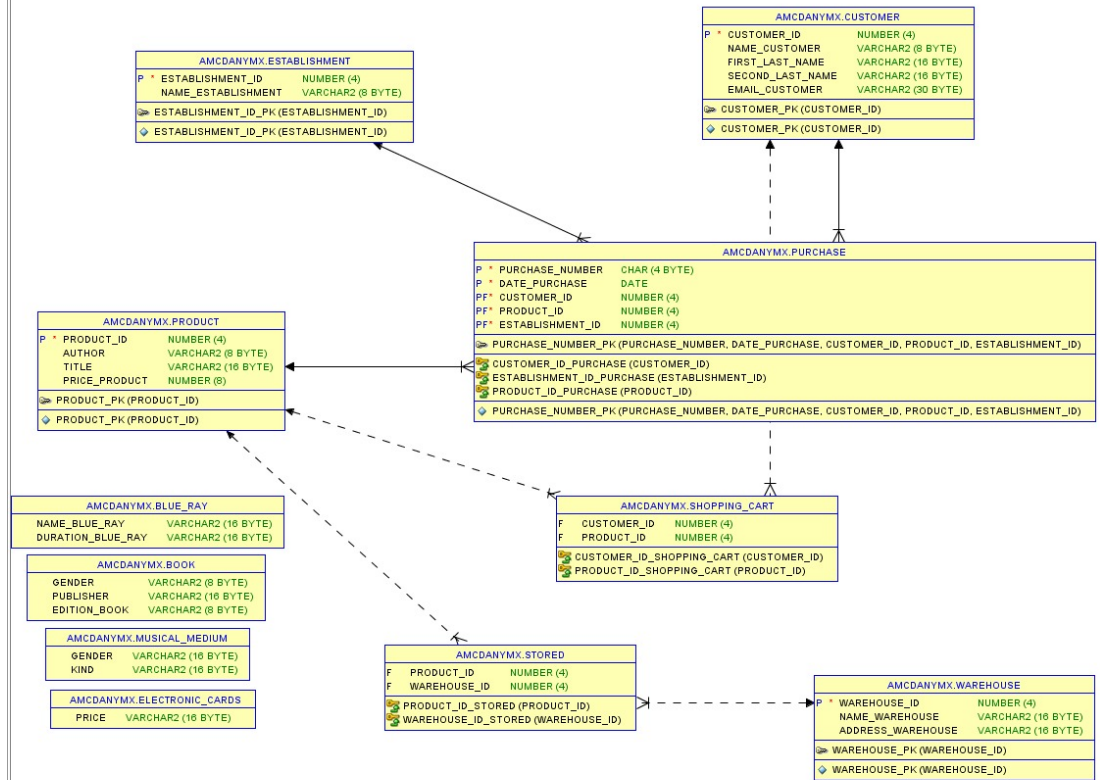
Write the section that describes the Work developed in the following activities. There is an establishment that provides book sales. Such books are always interested in knowing their author (s) and their publisher, as well as the warehouse where they are stored and the sales establishment (around the world) where they are sold. Suppose the bookstore adds music cassettes, CDs, Blue-ray and electronic cards for online purchases (a code for digital format) to its collection. 1) Generate an entity-relationship model that allows obtaining information such as the one indicated (this information is only a set of requirements):

- Customers who buy the most items.
- Products that customers currently have in the shopping cart.
- Know the best-selling product.
- Know what items are in stock on a specific date.
- Obtain the lists of the books with their complete data.
- Know the author of the best-selling book.
- Know the best-selling musical medium.
- Know the least sold type of musical medium.
- Know today's sales.
- Know the best-selling electronic files.

Relational Model.



Relational Model with DATA MODELER

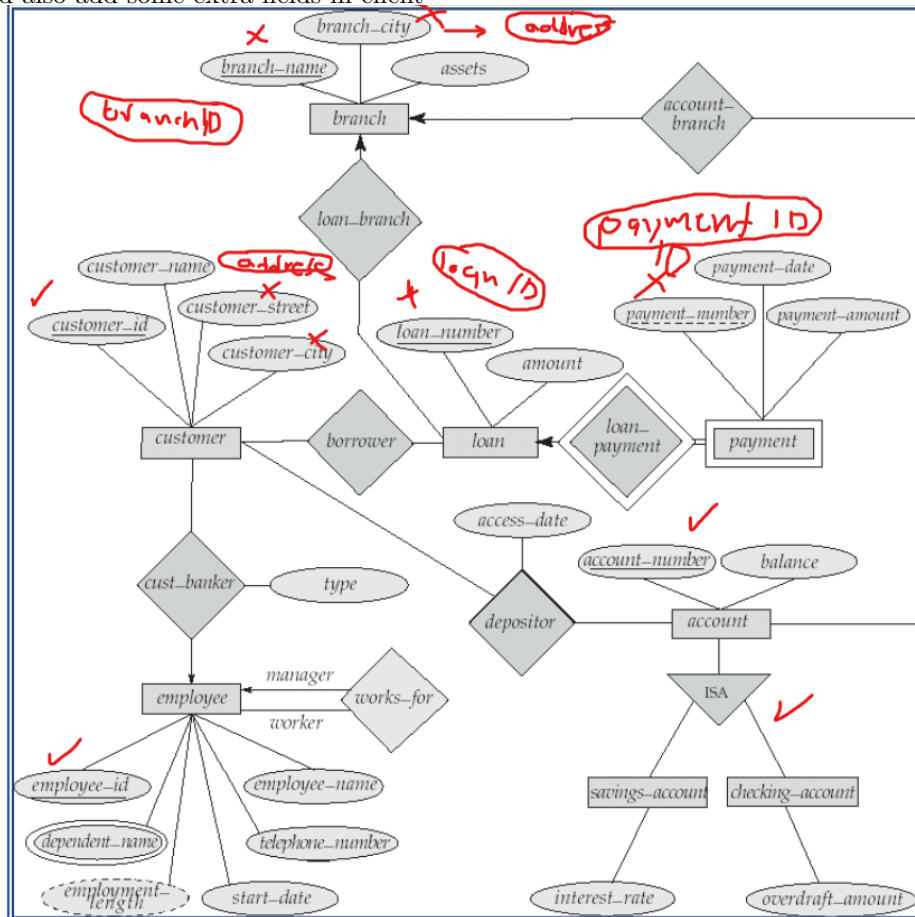


3 Activity 2

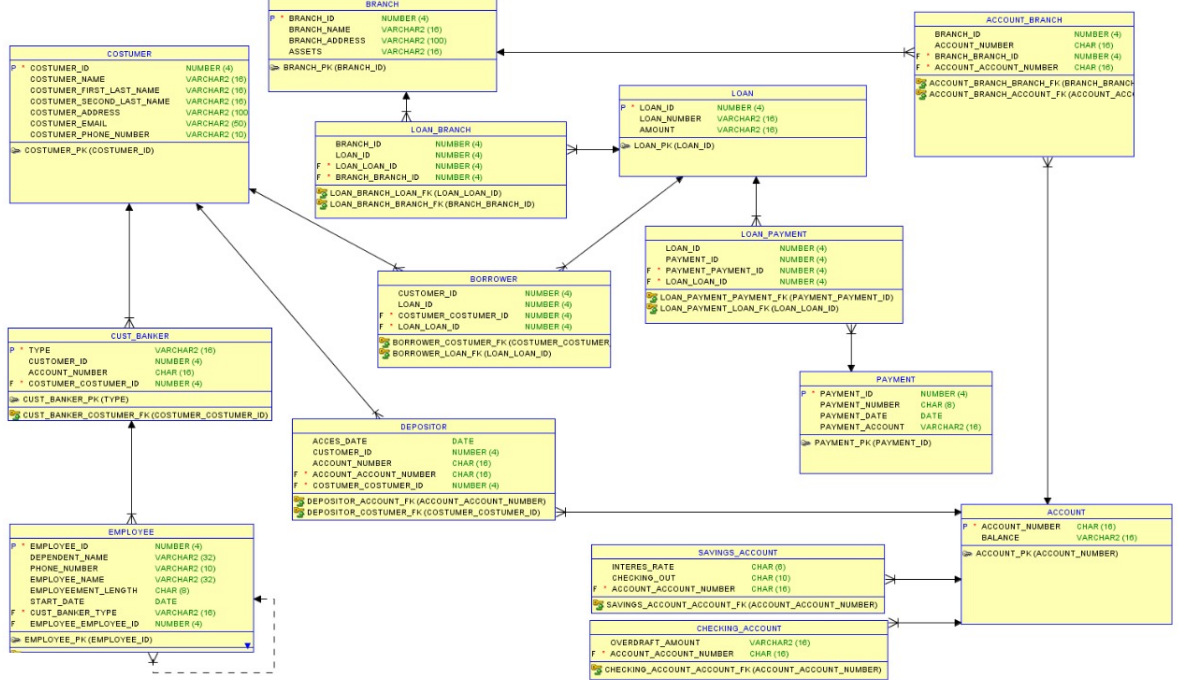
Write the section that describes the Work developed in the following activities.

- Check the primary key columns.
- Then correct the necessary attributes in the whole diagram.
- Convert the following entity-relationship diagram to relational model using Sqldeveloper.
- Generate automatically the logical model by using the reverse engineering.

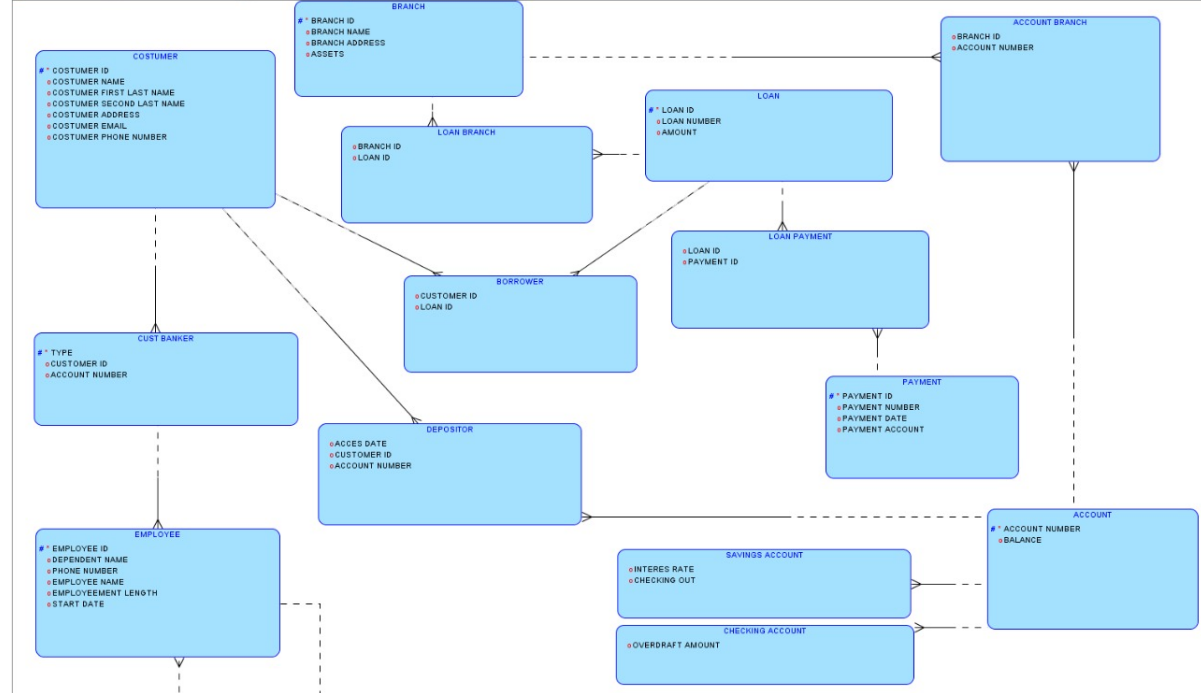
Some attributes with primary keys I found wrong, I decided to change them for their IDs like branch name, loan number, payment number. In the attributes where you had fields such as city and street, replace them with the "address" field also add some extra fields in client



RELATIONAL MODEL WITH DATA MODELER



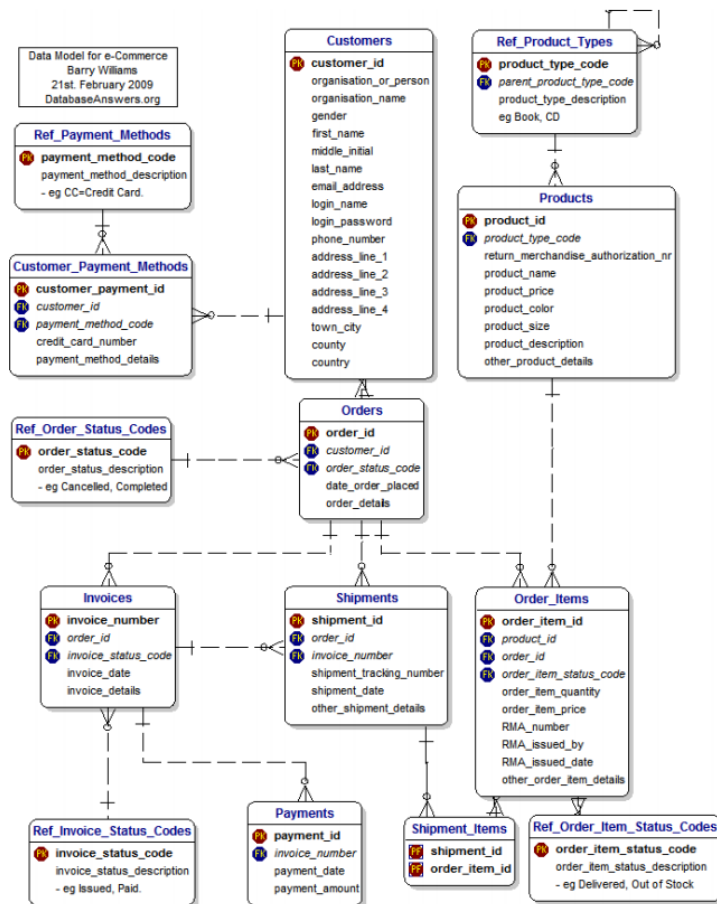
LOGIC MODEL WITH DATA MODELER



4 Activity 3

Write the section that describes the Work developed in the following activities.
Using the relational diagram, convert it to entity-relationship model.

Relational diagram



The diagram illustrates the following entities and their attributes:

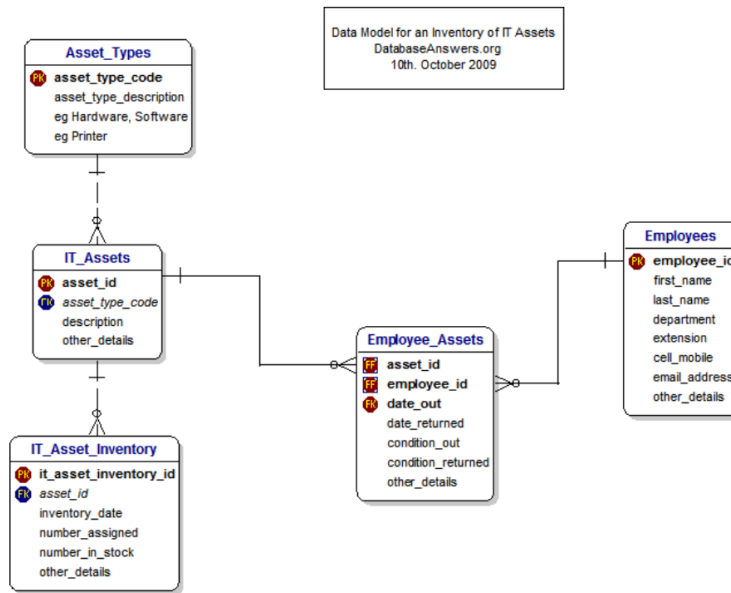
- Customer**: phone number, address line 1, address line 2, address line 3, city, country, login password, login name, email address, first name, middle name, last name, first name, gender, organization name, organization or person, customer id.
- Product**: other product details, product description, product size, product color, product price, product name, return type code, product type code, product id.
- Order**: ref order status code, order id, customer id, other status code, date order placed.
- Invoice**: invoice number, order id, invoice status code, invoice date, invoice details.
- Payment**: payment id, invoice number, payment date, payment amount.
- Shipments**: shipment tracking number, date shipment details, shipment date, invoice number, order id, shipment id.
- OrderItems**: order item id, product id, other id, order item status code, order item quantity, order item price, sku number, sku issued by, sku issued date, other order item details, ref order status code, order status code, order status description.
- CustomerPaymentMethods**: customer id, customer payment id, payment method code, credit card number, payment method details.
- RefPaymentMethods**: payment method code, payment method description.
- RefInvoiceStatusCodes**: invoice status code, invoice status description.
- ShipmentsItems**: shipment id, order item id.
- OrderStatusCodes**: product type code, parent product type code, product type description.

Relationships are indicated by lines connecting the entities. Notable relationships include:

- Customer** (1) to **Order** (M).
- Order** (1) to **Invoice** (M).
- Product** (1) to **OrderItems** (M).
- Customer** (M) to **Product** (M).
- Order** (M) to **Product** (M).
- Customer** (M) to **CustomerPaymentMethods** (M).
- CustomerPaymentMethods** (M) to **RefPaymentMethods** (M).
- OrderItems** (M) to **ShipmentsItems** (M).
- OrderItems** (M) to **RefOrderStatusCodes** (M).
- Invoice** (M) to **RefInvoiceStatusCodes** (M).
- Payment** (M) to **RefPaymentMethods** (M).

5 Activity 4

Write the section that describes the work developed in the following activities. Using the following physical diagram: 1) Generate the corresponding DDL Oracle statements. 2) Generate automatically the corresponding relational model in Sqldeveloper (using the GUI). 3) Compare the results with the provided in this exercise. 4) Generate automatically the logical model by using the reverse engineering.



DDL Oracle statements

```

CREATE TABLE IT_ASSET_INVENTORY(
  IT_ASSET_INVENTORY_ID NUMBER(4) CONSTRAINT IT_ASSET_INVENTORY_ID_PK PRIMARY KEY,
  ASSET_ID NUMBER(4),
  INVENTORY_DATE DATE,
  NUMBER_ASSIGNED CHAR(8),
  NUMBER_IN_STOCK CHAR(8),
  OTHER_DETAILS VARCHAR(16),
  CONSTRAINT ASSET_ID_FK FOREIGN KEY(ASSET_ID) REFERENCES IT_ASSETS(ASSET_ID)
);

CREATE TABLE EMPLOYEE_ASSETS(
  ASSET_ID NUMBER(4),
  EMPLOYEE_ID NUMBER(4),
  DATE_OUT DATE,
  DATE_RETURNED DATE,
  CONDITION_OUT VARCHAR(16),
  CONDITION_RETURNED VARCHAR(16),
  OTHER_DETAILS VARCHAR(16),

  CONSTRAINT ASSET_ID_EASSETS FOREIGN KEY(ASSET_ID) REFERENCES IT_ASSETS(ASSET_ID),
  CONSTRAINT EMPLOYEE_ID_ASSETS FOREIGN KEY(EMPLOYEE_ID) REFERENCES EMPLOYEES(EMPLOYEE_ID)
);

```

Hoja de Trabajo Generador de Consultas

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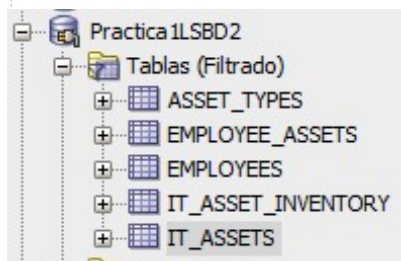
CREATE TABLE ASSET_TYPES(
  ASSET_TYPE_CODE NUMBER(4) CONSTRAINT ASSET_TYPE_CODE_PK PRIMARY KEY,
  ASSET_TYPE_DESCRIPTION VARCHAR(16),
  EG_SOFTWARE_HARDWARE VARCHAR(25),
  EG_PRINTER VARCHAR(16)
);

CREATE TABLE EMPLOYEES(
  EMPLOYEE_ID NUMBER(4) CONSTRAINT EMPLOYEE_ID_PK PRIMARY KEY,
  FIRST_NAME VARCHAR(16),
  LAST_NAME VARCHAR(16),
  DEPARTMENT VARCHAR(16),
  EXTENSION VARCHAR(8),
  CELL_MOBILE CHAR(8),
  EMAIL_ADDRESS VARCHAR(32),
  OTHER_DETAILS VARCHAR(16)
);

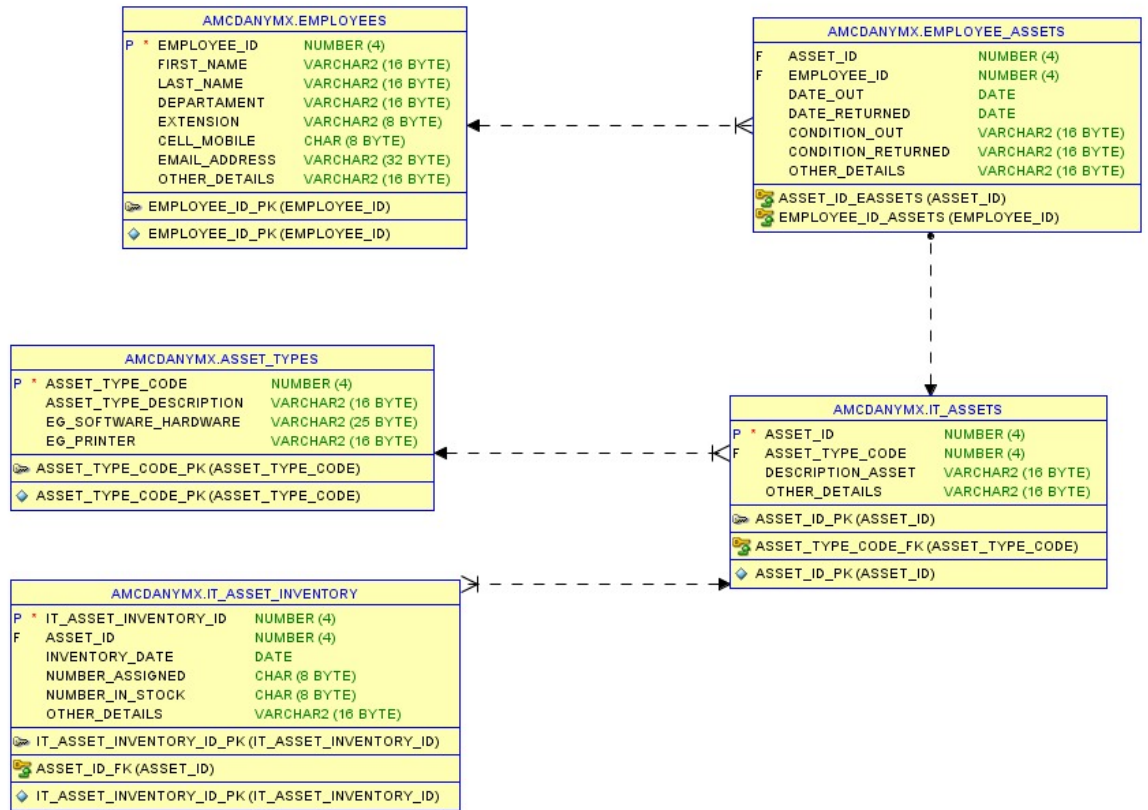
CREATE TABLE IT_ASSETS(
  ASSET_ID NUMBER(4) CONSTRAINT ASSET_ID_PK PRIMARY KEY,
  ASSET_TYPE_CODE NUMBER(4),
  DESCRIPTION_ASSET VARCHAR(16),
  OTHER_DETAILS VARCHAR(16),

  CONSTRAINT ASSET_TYPE_CODE_FK FOREIGN KEY(ASSET_TYPE_CODE) REFERENCES ASSET_TYPES(ASSET_TYPE_CODE)
);

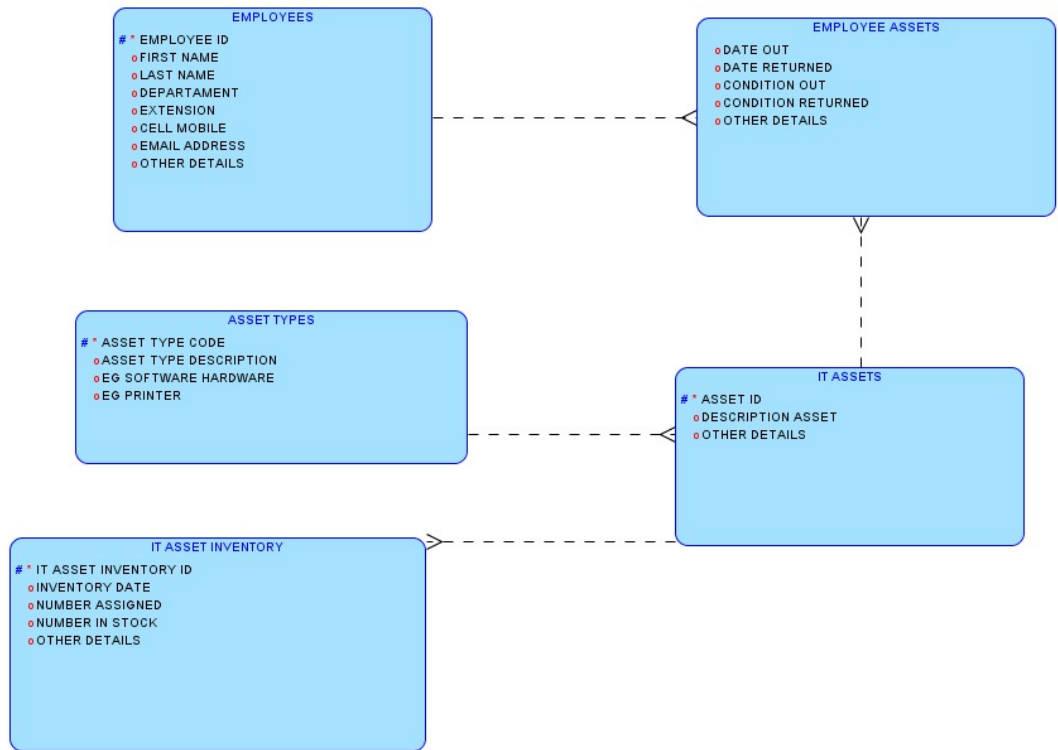
```



Relational model in Sqldeveloper (using the GUI).



Logical model using the reverse engineering



6 PRE-EVALUATION

Practices pre-Assessment for Database Systems Laboratory II Pre-Assessment
PRACTICE carried out by student

1 COMPLIES WITH THE REQUESTED FUNCTIONALITY
YES

4 HAS THE CORRECT INDENTATION
YES

6 HAS AN EASY WAY TO ACCESS THE PROVIDED FILES
YES

7 HAS A REPORT WITH IDC FORMAT
YES

8 REPORT INFORMATION IS FREE OF SPELLING ERRORS
YES

9 DELIVERED IN TIME AND FORM
YES

10 IS FULLY COMPLETED (SPECIFY THE PERCENTAGE COMPLETED)
YES, 100 percent

7 Conclusion

The entity relationship diagrams are important to have a correct development of the database logic, and can be seen better in the relational models. this practice helped me to learn something else and review the topic again.

in the activity there were things from database 1 that I did not remember well and I had to fix those things but in the end it helped me.

We know that entity-relationship models are very important for the realization of databases and we have to pay close attention to them.

8 Extra-notes

A tablet with images and script of the practice is attached