BÀI TẬP
THIẾT KẾ CƠ SỞ DỮ LIỆU

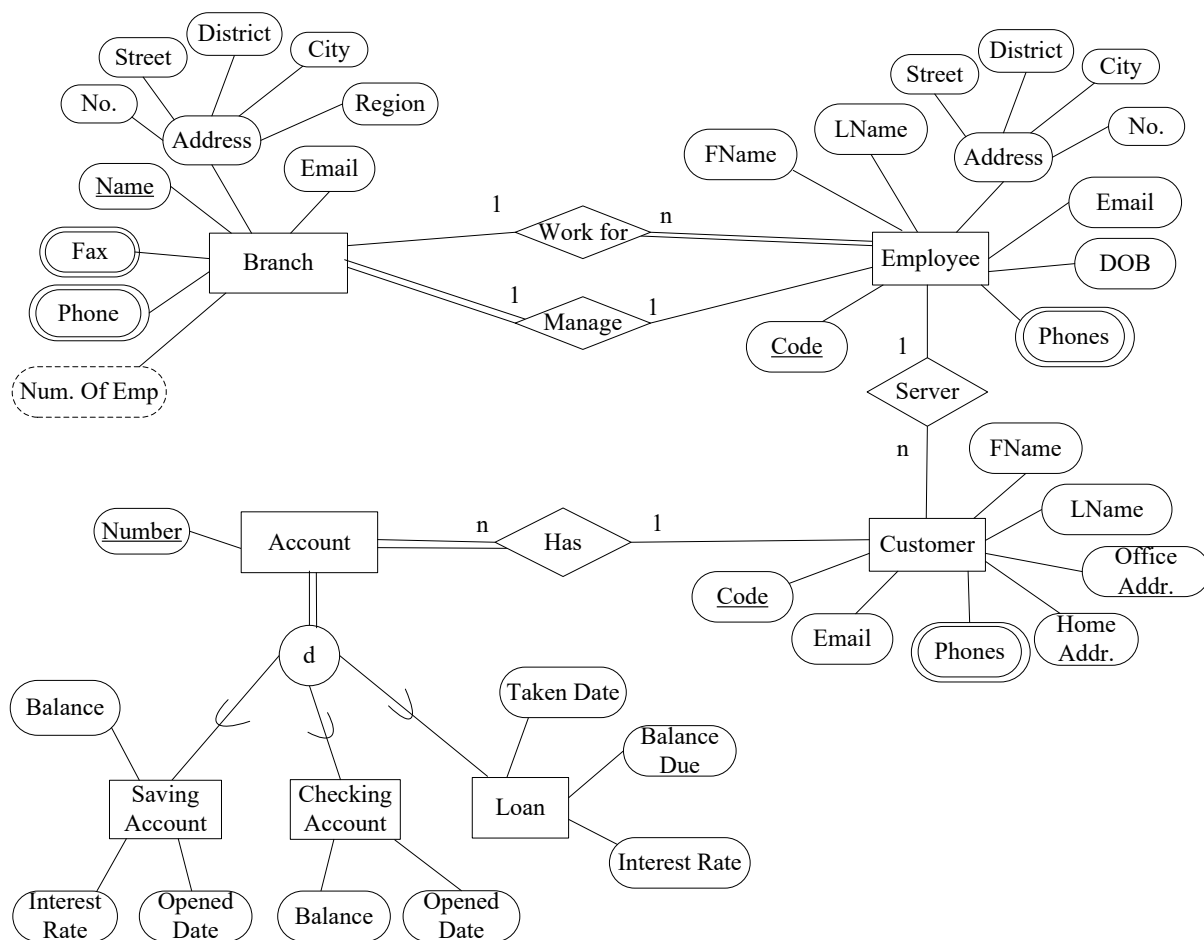## Mục lục

QUESTION 1. ABC Bank

ABC Bank has many branches. Each branch has a unique name, an address (including No., Street, District, City, and Region), phone numbers, fax numbers, email, and total number of employees working there. Each branch has many employees and an employee must work at a branch. There is always one employee assigned to manage that branch. The employee can only manage the office to which he or she is assigned. For each employee, we need to store a unique code, first name, last name, date of birth, phone numbers, email, and home address (including No., Street, District, and City). The bank issues three different types of bank accounts for their customers. For Savings Accounts, the bank must keep track of the account's balance, interest rate, and the date the account was opened. Checking Accounts pay no interest, so the bank keeps track of just the balance and date opened. The third type of account, Loans, requires tracking the date the loan was taken, the balance due, and the interest rate of the loan. Each customer may have any number of bank accounts, and all accounts have a unique account number. The bank save the following information of each customer: a unique code, first name, last name, home address, office address, phone numbers, email. Each customer is attended by an employee and an employee can serve many customers.

1. Thiết kế Cơ sở dữ liệu ở mức Khái niệm, Luận lý và Vật lý
Solution Example

BRANCH (**Name**, AddressNo, Street, District, City, Region, Email, *MngCode*)
BRANCHPHONE (***BraNam**e*, **Phone**)
BRANCHFAX (***BraName***, **Fax**)
EMPLOYEE (**Code**, FName, LName, AddressNo, Street, District, City, DOB, Email, *BraName*)
EMPLOYEEPHONE (***EmpCode***, **Phone**)
CUSTOMER (**Code**, FName, LName, OfficeAddress, HomeAddress, Email, *EmpCode*)
CUSTOMERPHONE (***CusCode***, **Phone**)
ACCOUNT (**Number**, *CusCode*)
SAVINGACCOUNT (***AccNumber***, Balance, InterestRate, OpenedDate)
CHECKINGACCOUNT (***AccNumber***, Balance, OpenedDate)
LOAN (***AccNumber***, BalanceDue, InterestRate, TakenDate)

2. Query: Insert, Update, Delete, Select

a. You are required to insert valid and meaningful data into the database. Each table has at least 4 rows.

b. Change last name of an employee whose code is "N1080" to "Brown".

c. Delete the employee having code "N1080". Explain what will happen to the customers who are severed by this employee.

d. Retrieve all account numbers of a customer whose name is Peter Johnson.

e. Find all employees who have their birthdays in March 2010.

f. Retrieve the total balance of all saving accounts owned by a customer named "Peter Johnson" (Supposing that he has many saving accounts)

QUESTION 2. Electricity Management

A university wants to build an electricity management system. The university has many buildings, and each building has many rooms. For each building, we need store a unique code in the university. Each room has a unique code in each building, and the room type. The room type has the following information: a unique code, the function of the room (for example: lab room, office, large-size study room, middle-size study room, small-size study room, …), and description. Each room type also has a maximum number of kilowatt hours that could be used in a month. There is an employee who is responsible for the electricity management of the building. An employee can manage many buildings. The following information of each employee must be kept track: a unique code, first name, last name, date of birth, phone number(s), home address, and the building she/he managed. Each room is assigned an electricity meter. For each electricity meter, we store the following information: a unique code, vendor, start number of kilowatt hours, maximum number of kilowatt hours. When assigning an electricity meter to room, we must record the assign date, and the number of kilowatt hour at that time. At the end of each month, an employee, who manages the building, records the current number of kilowatt hours and the number of kilowatt hours used in each room.

1. Thiết kế Cơ sở dữ liệu ở mức Khái niệm, Luận lý và Vật lý

2. Query: Insert, Update, Delete, Select

a. You are required to insert valid and meaningful data into the database. Each table has at least 4 rows.

b. Change DOB of an employee whose code is "N1080" to "10-03-1973" (dd-mm-yyyy).

c. Delete the employee having code "N1080". Explain what will happen to the buildings which are managed by this employee.

d. Retrieve the information (including code, first name, last name, address, date of birth and phones) of the employee who manages building B4.

e. Retrieve all the rooms having type "Computer Lab" and being managed by an employee whose name is Peter Johnson.

f. Calculate the total KH used in March 2010 from all "Computer Lab" rooms in the university.

QUESTION 3. Motorcycle Registration Department

At motorcycle registration department, when a person comes for new motorcycle registration, he/she has to show identity number, full name, date of birth, address, gender at first for checking legality. The information of motorcycle then is filed. The motorcycle information contains identity number, skeleton identity number, engine identity number, engine capacity, type and model of motorcycle, personal identity number of motorcycle owner, and date of registry. Each motorcycle is produced by a brand name and is distributed by some legal distributors. The distributors are registered to department with sale permission number, name, and address. When owner buys a motorcycle, date of sale, total sale amount is record in VAT bill. Together with VAT bill, the owner also has to pay registration tax according to rates list (delivered by registration department). In tax rate list, each tax rate has a code, percentage and description. For each motorcycle, registration tax process will deliver an appropriate bill related to tax rate. Tax amount is equal to tax rate multiply by sale amount. In the bill, date of payment and amount also are recorded. The owner then uses tax bill to receive motorcycle document kit.

1. Thiết kế Cơ sở dữ liệu ở mức Khái niệm, Luận lý và Vật lý

2. Query: Insert, Update, Delete, Select

a. You are required to insert valid and meaningful data into the database. Each table has at least 4 rows.

b. Change BranchName of a motorcycle from "VMEP" to "SYM".

c. Delete all motorcycles which date of selling is before 04/05/1990 (DD/MM/YYYY). Explain what will happen to the owner card which contains these motorcycles.

d. Retrieve the information of the distributor which sold the largest number of motorcycle.

e. List all branch names which pay the same tax rate with branch name "Honda".

f. Calculate the total tax amount of motorcycle registration department collected in March 2010 from all "Yamaha" motorcycle.

QUESTION 4. Hotel in Oslo

Hotel in Oslo is managed by Tourist Department of city government. Each hotel is managed by hotel code, name, address, and construction year. Each hotel has a kind of service such as cuisine, type of taste, foods and decoration style. Together with hotel, landscapes nearby the hotel are also listed. List of landscape contains order number of landscapes, name of landscape, description, history, mean of landscape. Price of each room in hotel also is recorded and depended on type of room. Of course, each hotel has many rooms as much as many types of rooms. When a guest comes to hotel, check-in information included guest identity number, name, gender, address, and date of birth is recorded. When the guest checks out, the hotel must report to Tourist Department information of guest rental such as room number, identity number, date of check-in and check-out to store in database for later retrieval.

1. Thiết kế Cơ sở dữ liệu ở mức Khái niệm, Luận lý và Vật lý
2. Query: Insert, Update, Delete, Select

a. You are required to insert valid and meaningful data into the database. Each table has at least 4 rows.

b. Change hotel name from "Rex" to "Sheraton".

c. Delete landscape name "Cantho Ferry". Explain what will happen to the hotels which are neighbor of "Cantho Ferry".

d. Retrieve the information of the hotel which price is the highest price.

e. List all foods of hotel which price is the lowest price.

f. Count number of guest who stayed in hotel around "Vinh Long" bridge in year 2000.

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