**Practice Assignment – Quarter 4, 2023-2024**

**Course Name:** Database

**Course Code:** CSE 301

**Student's Full Name:**

**Student ID:**

## Practice Assignment 9

*Overview*:

**Part 1: Essay question**

1. Find Entities, Relationships.
2. Write algebra relationships.

**Part 2: Practice questions**

3. Draw ER-Diagram.
4. Create constraints for database.
5. Write SQL queries.

## Problem A. Building an ER model and relational data model for 1 hotel needs to store information as follows:

A trading company specializing in electronic items. The company imports items from different suppliers. Details about the items include item code (unique), item name, and item descriptions.

The company also needs to keep information about suppliers such as name, address, phone, fax. Each provider has a unique code. Each supplier can offer multiple items but each item is only available from one supplier.

Items are stored in warehouses. Each warehouse has a different area and contains only one type of item.

The company has many stores to sell items. Each store has a store code, store name, address, and phone. Items are provided to stores through export bills. The information on each export bill needs to include the code of the store where the items are received, the date of delivery, information about the items to be exported such as the name, quantity, unit price, and cash.

## Problem B. Using Database "managementproject" in Lab 2:

EMPLOYEES (employeeID, lastName, middle Name, firstName, date0fBirth, gender, salary, address, managerID, departmentID)

DEPARTMENT (departmentID, departmentName, managerID, date0fEmployment)

DEPARTMENTADDRESS (departmentID, address)

PROJECTS (projectID, projectName, projectAddress, departmentID)

ASSIGNMENT (employeeID, projectID, workingHour)

RELATIVE (employeeID, relativeName, gender, date0fBirth, relationship)

## I. Writing algebra relationships according to questions below:
1. Find employees who work in room 4.
2. Find employees with salaries above 30000.
3. For each department, indicate the department name and room location.
4. The average salary of all female employees.
5. Find the names and addresses of all employees of the "Nghien Cuu" department.
6. Find employees who are both project managers and within the "Research" department.
7. Find employees who are not involved in any projects.

## II. Creating constraint for database:
1. Check constraint to value of gender in "Nam" or "Nu".
2. Check constraint to value of salary > 0.
3. Check constraint to value of relationship in Relative table in "Vo chong", "Con trai", "Con gai", "Me ruot", "Cha ruot".

## III. Writing SQL Queries.
1. Look for employees with salaries above 25,000 in room 4 or employees with salaries above 30,000 in room 5.
2. Provide full names of employees in HCM city.
3. Indicate the date of birth of Dinh Ba Tien staff.
4. The names of the employees of Room 5 are involved in the "San pham X" project and this employee is directly managed by "Nguyen Thanh Tung".
5. Find the names of department heads of each department.
6. Find projectID, projectName, projectAddress, departmentID, departmentName, departmentID, date0fEmployment.
7. Find the names of female employees and their relatives.

8. For all projects in "Hanoi", list the project code (projectID), the code of the project lead department (departmentID), the full name of the manager (lastName, middleName, firstName) as well as the address (Address) and date of birth (date0fBirth) of the Employees.

9. For each employee, include the employee's full name and the employee's line manager.

10. For each employee, indicate the employee's full name and the full name of the head of the department in which the employee works.

11. Provide the employee's full name (lastName, middleName, firstName) and the names of the projects in which the employee participated, if any.

12. For each scheme, list the scheme name (projectName) and the total number of hours worked per week of all employees attending that scheme.

13. For each department, list the name of the department (departmentName) and the average salary of the employees who work for that department.

14. For departments with an average salary above 30,000, list the name of the department and the number of employees of that department.

15. Indicate the list of schemes (projectID) that has: workers with them (lastName) as 'Dinh' or, whose head of department presides over the scheme with them (lastName) as 'Dinh'.

16. List of employees (lastName, middleName, firstName) with more than 2 relatives.

17. List of employees (lastName, middleName, firstName) without any relatives.

18. List of department heads (lastName, middleName, firstName) with at least one relative.

19. Find the surname (lastName) of unmarried department heads.

20. Indicate the full name of the employee (lastName, middleName, firstName) whose salary is above the average salary of the "Research" department.

21. Indicate the name of the department and the full name of the head of the department with the largest number of employees.

22. Find the full names (lastName, middleName, firstName) and addresses (Address) of employees who work on a project in 'HCMC' but the department they belong to is not located in 'HCMC'.

23. Find the names and addresses of employees who work on a scheme in a city but the department to which they belong is not located in that city.

24. Create procedure List employee information by department with input data departmentName.

25. Create a procedure to Search for projects that an employee participates in based on the employee's last name (lastName).

26. Create a function to calculate the average salary of a department with input data departmentID.

27. Create a function to Check if an employee is involved in a particular project input data is employeeID, projectID.