

Section Practice Worksheet

Problem 1: More SQL practice

```
CREATE TABLE Employees (  
    Employee_id INTEGER PRIMARY KEY,  
    First_Name VARCHAR(30),  
    Last_Name VARCHAR(30),  
    Salary REAL,  
    Manager_Id INT,  
    Department_Id INT REFERENCES Departments  
);
```

```
CREATE TABLE Departments(  
    Department_Id INTEGER PRIMARY KEY,  
    Department_Name VARCHAR(30),  
    Manager_Id INT,  
    Location_Id INT REFERENCES Locations,  
);
```

```
CREATE TABLE Locations(  
    Location_Id INTEGER PRIMARY KEY,  
    City VARCHAR(30),  
    State VARCHAR(30),  
    Country_Id VARCHAR(2),  
);
```

Problems:

1. Write a query to find the name (first_name, last_name), and salary of the employees whose salary is greater than the average salary of all departments.

```
SELECT * FROM employees  
WHERE salary >  
ALL(SELECT avg(salary)FROM employees GROUP BY department_id);
```

1. Write a query to find the name, and salary of the employees who earns more than the average salary and works in any of the IT departments. (IT departments start with "IT_")

```
SELECT first_name, last_name, salary
FROM employees
WHERE department_id IN

    (
        SELECT department_id
        FROM departments
        WHERE department_name
        LIKE 'IT%'
    )

AND salary > (SELECT avg(salary) FROM employees);
```

2. Write a query to find the name of the employees who have a manager and worked in a USA based department.

```
SELECT first_name, last_name FROM employees
WHERE manager_id in (select employee_id
FROM employees WHERE department_id
IN (SELECT department_id FROM departments WHERE location_id
IN (select location_id from locations where country_id='US')));
```

Problem 2: Entity Relationship Diagram

Consider the following database schema for a restaurant.

Ingredient(iid, name, allergen)
Dish(did, name, description, category)
IngredientIn(iid, did)
Order(oid, customer)
DishOrder(oid, did, num)

Draw an E/R diagram to represent the database, with the Ingredient, Dish, and Order tables as the entities, and IngredientIn and DishOrder as the relationships. Make sure to enforce the following constraints:

1. Ingredient.**iid**, Dish.**did**, Order.**oid** are the primary keys of the corresponding tables
2. A Dish should have **at least one** Ingredient.
3. An Order should have **at least one** Dish.

