# Tutorial 2

## Exercise 1

Consider the "**Employee**" table below from a relational database:

| employee_id | first_name | last_name | phone_number | department | hire_date | birth_date |
|---|---|---|---|---|---|---|
| 101 | Alice | Smith | 555-1234 | Sales | 2021-03-15 | 1990-09-04 |
| 102 | Robert | Jones | 555-5678 | Marketing | 2022-01-20 | 1995-02-21 |

a. How many records and fields are in this table?
b. Identify the data types of each field.

## Exercise 2

a. For each of the following cases, identify the data fields needed to be able to extract the corresponding information (considering a relational database for an **Inventory System**):

| N | Required information | Data needed to be collected |
|---|---|---|
| 1 | **Monthly Total Sales Value** | Fields: sale_amount, sale_date |
| 2 | **Suppliers who provided materials in the last quarter** | Fields: supplier_id, material_id, supply_date |
| 3 | **Inventory value for each warehouse location** | Fields: warehouse_id, product_price, quantity_on_hand |
| 4 | **List of products nearing their expiration date** | Fields: product_id, product_name, expiration_date |
| 5 | **Total handling cost per type of product** | Fields: product_type, handling_cost, (shipment_id) |
| 6 | **Average time from order placement to shipment** | Fields: order_id, order_date, shipment_date |
| 7 | **Average inspection time per quality inspector** | Fields: inspector_id, inspection_start_time, inspection_end_time |
| 8 | **Total cost of replacing defective parts** | Fields: part_id, replacement_cost, (replacement_date) |
| 9 | **Quarterly profit margins** | Fields: revenue, cost_of_goods_sold, quarter |
| 10 | **Tasks completed under budget** | Fields: task_id, budgeted_cost, actual_cost |

b. Give the steps to follow to extract the information described in lines 1, 2, and 5 of the previous table.

1. **Monthly Total Sales Value:**
2. **Suppliers who provided materials in the last quarter:**
3. **Total handling cost per type of product:**

## Exercise 3

Let's take the "**ProjectAssignment**" table from a relational database for managing employee work on various projects:

**ProjectAssignment Table:**

| project_code | project_name | employee_name | employee_id | employee_department | hours_w |
|---|---|---|---|---|---|
| ... | ... | ... | ... | ... | ... |

Provide better design to avoid data redundancy.

## Exercise 4

Considering each of the following activities, select whether the activity requires: an **Intranet**, an **Extranet**, or the **Internet**.

| N | Example of activity | Intranet | Extranet | Internet |
|---|---|---|---|---|
| 1 | **Accessing the company's internal payroll system** | | | |
| 2 | **Providing a restricted platform for distributors to check inventory** | | | |
| 3 | **Searching for a new job posting on a public job board** | | | |
| 4 | **Submitting an annual budget report to the accounting department** | | | |
| 5 | **Viewing real-time shipment tracking for a vendor's delivery** | | | |
| 6 | **Using an Enterprise Resource Planning (ERP) system for internal resource management** | | | |
| 7 | **Conducting a secured live training session with client staff** | | | |
| 8 | **Checking the company-wide holiday calendar** | | | |
| 9 | **Downloading a public white paper from a competitor's site** | | | |
| 10 | **Viewing the daily production schedule on a shared dashboard** | | | |

## Exercise 5

A **local restaurant chain** with multiple locations sells dishes and offers catering services. The business wants to be able to:

- Identify the **most popular dishes** sold across all locations.
- Track the **performance of each restaurant location** (e.g., total revenue).
- Identify the **peak hours** for sales.
- Manage **inventory** of ingredients.
- Identify the **most active catering clients**.

What data do you think is needed for designing the corresponding database?

a) Restaurant/Location Data:

b) Menu/Dish Data:

c) Inventory Data:

d) Sales/Order Data:

e) Client/Catering Data: