

## Tutorial 2 Solution

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### \*\*Exercise 1:

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

a. How many records and fields are in this table:

- 2 records (or rows)
- 7 fields (or columns)

b. Identify the data types of each field:

- employee\_id: Number (or Integer)
- first\_name, last\_name, phone\_number, department: Text (or String/Varchar)
- hire\_date, birth\_date: Date

### \*\*Exercise 2:

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a. Data fields needed:

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)

N	Required information	Data needed to be collected
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. Steps to follow to extract the information described in lines 1, 2, and 5:

1. Monthly Total Sales Value:

1. Group sales records by month (derived from `sale_date`).
2. Calculate the sum of `sale_amount` for each month.

2. \*Suppliers who provided materials in the last quarter:

1. Filter the supply records to keep only those where `supply_date` falls within the last three months (the last quarter).
2. Group the resulting records by `supplier_id`.

3. Total handling cost per type of product:

1. Group shipments/costs by `product_type`.
2. Calculate the sum of `handling_cost` for each product type.

## \*\*Exercise 3:

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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		✓	

N	Example of activity	Intranet	Extranet	Internet
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 4:

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This design suffers from redundancy because the **employee's name and department** are repeated for every project they work on, and the **project's name** is repeated for every employee assigned to it.

The new database will contain 3 normalized tables:

1. **Employees Table:** Stores employee-specific details.

- employee\_id
- employee\_name
- employee\_department

2. **Projects Table:** Stores project-specific details.

- project\_code
- project\_name

3. **Assignment Table (Linking Table):** Links employees to projects and stores assignment-specific data.

- employee\_id
- project\_code
- hours\_worked

## \*\*Exercise 5:

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To meet the business requirements (sales analysis, performance tracking, peak hours, inventory, and loyal clients), the following data is needed:

a) **Restaurant/Location Data:**

- location\_id
- location\_name

- address
- phone\_number

**b) Menu/Dish Data:**

- dish\_id
- dish\_name
- category
- price

**c) Inventory Data (and link to Dishes):**

- ingredient\_id
- ingredient\_name
- stock\_quantity

**d) Sales/Order Data and Details:**

- order\_id
- location\_id
- `order\_date\_time
- total\_amount
- service\_type

**e) Client/Catering Data:**

- client\_id
- name
- phone\_number
- email
- registration\_date
- (address)