

German International University, Berlin

Media Engineering and Technology

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Databases I, Winter 2024

Milestone 2

Submission: 16/12/2024 (11:59 PM)

In this milestone, you are required to implement the following using the final EERD and its relational schema designed for a database about the “Supermarket Management System”.

2.1 Refinement of the ERD and Relational Schema:

First, determine all functional dependencies in the final EERD and its relational schema and then apply the first four normalization procedures learned in class. Finally, you should check that every relation is in Boyce-Codd Normal Form (BCNF). Then, you are ready to implement the basic structure of the database and basic data retrieval functionality according to the descriptions given below:

2.2 Basic Structure of the Database:

- a) Write an SQL query to create database called “Supermarket _Team_Your Team Number”
- b) Put the queries that create all the tables of your database with their definition inside this procedure.
 - i) Type: stored procedure
 - ii) Name: createAllTables
 - iii) Input:Nothing
 - iv) output: Nothing
- c) Drop all tables that your database has inside this procedure.
 - i) Type: stored procedure
 - ii) Name: dropAllTables
 - iii) Input:Nothing
 - iv) output:Nothing
- d) Drop all implemented stored procedures (except this one), functions and views that you implemented in this milestone.
 - i) Type: stored procedure
 - ii) Name: dropAllProceduresFunctionsViews

iii) Input:Nothing

iv) output:Nothing

e) Clear all records in all tables existing in your database.

i) Type: stored procedure

ii) Name: clearAllTables

iii) Input:Nothing

iv) output:Nothing

2.3 Basic Data Retrieval

a) Fetch details for all customer profiles along with their active accounts. (List all customer accounts)

i) Type: view

ii) Name: allCustomerAccounts

iii) Input:Nothing

iv) Output: Table

b) Fetch details for all employee profiles. (List all employees with related information)

i) Type: view

ii) Name: allEmployeeInformation

iii) Input: Nothing

iv) Output: Table

c) Fetch details for all Products for sale. (List all products with price information)

i) Type: view

ii) Name: allProducts

iii) Input:Nothing

iv) Output: Table

d) Fetch details for all Suppliers. (List all Supplier with related information)

i) Type: view

ii) Name: allSupplierInformation

iii) Input: Nothing

iv) Output: Table

e) Fetch details for all Payments. (Retrieve the highest payment amount, the average of all payments, etc.)

i) Type: view

ii) Name: allPaymentInformation

iii) Input:Nothing

iv) Output: Table

f) Fetch details for all Promotions. (List all promotions and related information)

i) Type: view

ii) Name: allPromotions

iii) Input:Nothing

iv) Output: Table

g) Fetch details of all Sales transactions. (Retrieve the average sales transactions amount per day, the highest sales transactions, etc.)

i) Type: view

ii) Name: allSalesInformation

iii) Input:Nothing

iv) Output: Table

h) Fetch the number of transactions per customer. (Retrieve the average number of transactions per customer)

i) Type: view

ii) Name: Num_of_ transactions

iii) Input:Nothing

iv) Output: Table

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Dr. Turker Ince, Ahmed Mohammed Hassan

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Milestone 2 ERD Refinement and Database Implementation

“Supermarket Management System”

1. Project Overview

This project aims to design and implement a database to manage the operations of a supermarket including customer, employee, product, sales, and inventory data management. The data management system handles mainly customer information, payment details, employees, products, suppliers, sales transactions, and inventory information.

The database will store critical information such as customer and employee profiles, customer accounts, sales transactions, product and supplier information, product promotions and inventory information. This system will support efficient data retrieval for customer service, payment and sales history, consumer products, and inventory.

The customer will automatically create an account upon purchasing a shopping card of the supermarket. This seamless process ensures immediate access to account features and services.

2. System Requirement

This section describes the different requirements that the system has to include.

2.1 Customer Profile

Detailed records of customer profile, including personal information such as name (first name and last name), phone, email, address, date of birth, and customer shopping card number.

2.2 Customer Account

Each account is uniquely tied to a customer’s shopping card number, allowing for tailored management of services and preferences associated with each customer.

Each account has account type, account start date, account status, and total points earned which represents points earned through various transactions, which can later be exchanged for multiple vouchers on future purchases.

2.2.1 Customer Card Points

Customer card points are earned through various payment transactions; each group of points is assigned based on a specific percentage calculated from a total transaction amount. Points record has ID and amount.

2.3 Employee Profile

It should include at least the following fields employee ID, name, position, hire date, and salary.

2.4 Product Information

Product ID, name, category (dairy, bakery, produce, etc.), brand, product's stock quantity, supply price and sale price.

2.5 Supplier Information

The supplier ID, name, contact, address, as well as product ID, supply price, and lead time information can be recorded. A product may have multiple suppliers.

2.6 Payment Information

Payment refers to the record of all previous transactions made by the customer account. Each payment transaction is uniquely identified by a payment ID. It also includes transaction amount, date of payment, payment method and payment status. This information enables tracking the payment history, ensuring transparency, and facilitating better financial management of the services.

2.6 Sales Transactions

Each sales transaction has an ID, date, total amount, employee ID, and customer account number, as well as other transaction details such as ID of the product sold, quantity sold, and its selling price. There can also be cash sales without customer details.

2.7 Promotions

The promotions represent various advantages or features offered to the customer's account. This includes points group, cashback, and exclusive offers.

A customer's account may be entitled to multiple promotions on the same time, while each promotion instance may be associated with one specific account.

The promotion ID serves as a unique identifier for each promotion. A promotion can also have a description, validity date (start and end date), and status (active or expired).