

## Mini ERP for Inventory and Employee Management

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The document achieves Key Milestone 1 for Database Management Systems Lab project. It contains the following sections:

1. Entity Description (in tabular form)
2. Detailed Business Rules (in numbered list form as given in Lecture 2b, Slide#4)
3. Entity Relationship Diagram (ERD) (drawn in draw.io and in form covered in Lecture 2)
4. Enhanced Entity Relationship Diagram (EERD) (drawn in draw.io and in form covered in Lecture 3)
5. References (It must contain all the references that you have taken help including AI Tools like ChatGPT, Bing AI, etc.)

### Section 1 Entity Description:

#### Entity 1: Products

Attribute	Data Type	Description	Constraints
product_id	Integer	Unique ID of the product	Primary Key, Auto Increment
name	Varchar(100)	Name of the product	Not Null
category_id	Integer	Linked product category	Foreign Key → categories
price	Decimal(10,2)	Price per unit	Not Null
quantity	Integer	Current stock quantity	Default: 0

#### Entity 2: Categories

Attribute	Data Type	Description	Constraints
category_id	Integer	Unique category ID	Primary Key, Auto Increment
name	Varchar(50)	Name of category	Not Null, Unique

#### Entity 3: Suppliers

Attribute	Data Type	Description	Constraints
supplier_id	Integer	Unique supplier ID	Primary Key, Auto Increment

name	Varchar(100)	Supplier name	Not Null
contact	Varchar(50)	Phone or email	Optional
address	Text	Supplier address	Optional

Entity 4: Purchases

Attribute	Data Type	Description	Constraints
purchase_id	Integer	Unique purchase ID	Primary Key, Auto Increment
product_id	Integer	Product being purchased	Foreign Key → products
supplier_id	Integer	Who supplied the product	Foreign Key → suppliers
quantity	Integer	Quantity purchased	Not Null
date	Date	Purchase date	Not Null

Entity 5: Employees

Attribute	Data Type	Description	Constraints
employee_id	Integer	Unique ID for employee	Primary Key, Auto Increment
name	Varchar(100)	Full name of employee	Not Null
department_id	Integer	Assigned department	Foreign Key → departments
salary	Decimal(10,2)	Monthly salary	Not Null
contact	Varchar(50)	Phone/email	Optional

Entity 6: Departments

Attribute	Data Type	Description	Constraints
department_id	Integer	Department ID	Primary Key, Auto Increment
name	Varchar(50)	Name of the department	Not Null, Unique

Entity 7: Attendances

Attribute	Data Type	Description	Constraints
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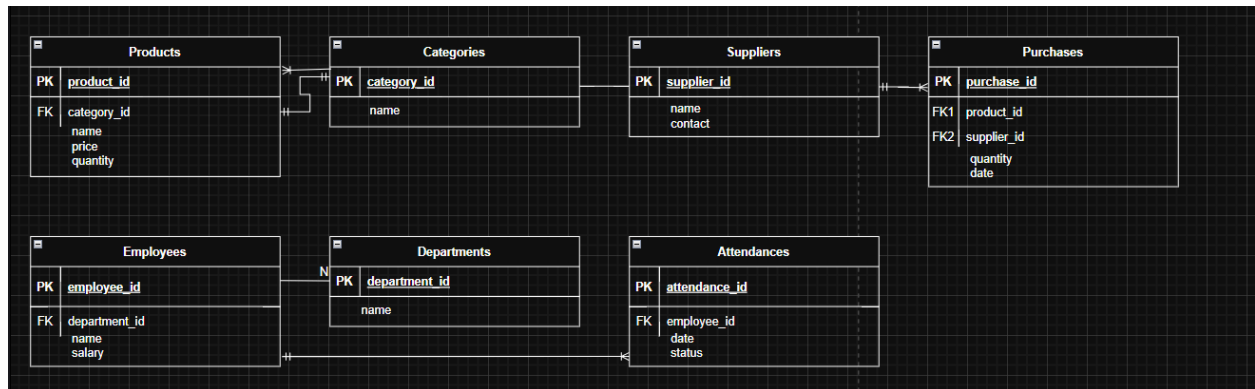
attendance_id	Integer	Unique attendance record	Primary Key, Auto Increment
employee_id	Integer	Who this attendance belongs to	Foreign Key → employees
date	Date	Date of attendance	Not Null
status	Enum('Present','Absent')	Attendance status	Default: 'Present'

## Section 2: Business Rules

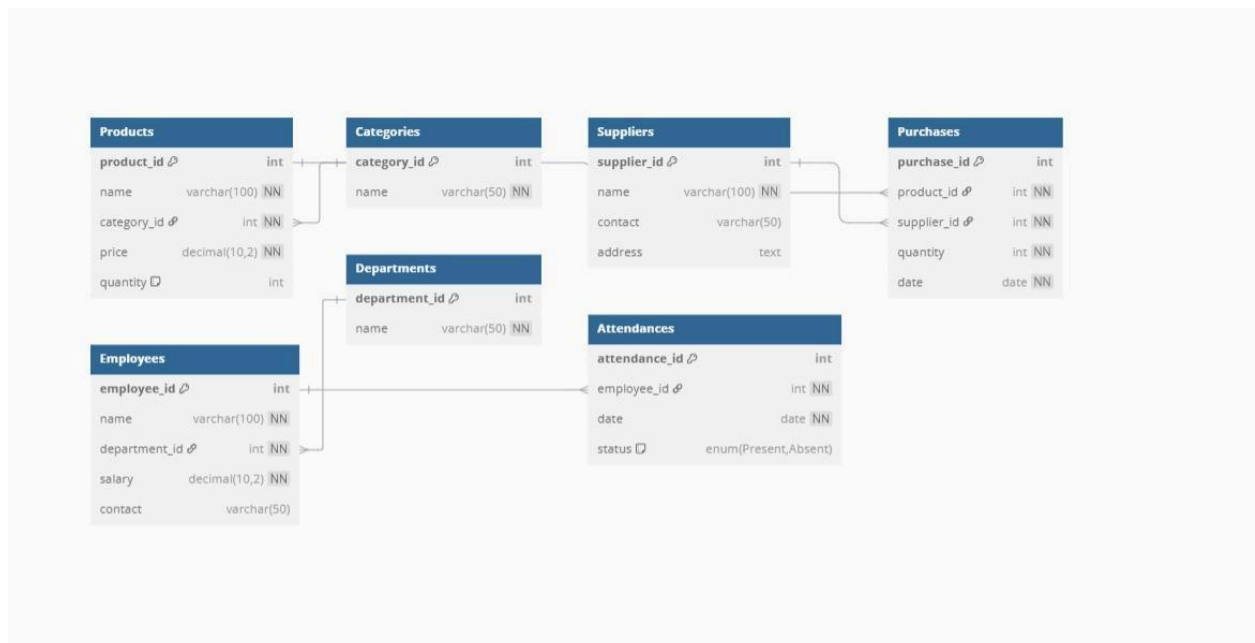
- Each product must belong to exactly one category.  
(Ensures all products are organized under a classification.)
- Each product can have multiple purchase records over time.  
(Tracks restocking activity and supplier interactions.)
- Each purchase must be associated with one and only one supplier.  
(Clarifies the source of purchased stock.)
- A supplier may supply multiple products.  
(Establishes a one-to-many relationship between supplier and products.)
- Each employee must be assigned to exactly one department.  
(Ensures clear responsibility and reporting structure.)
- Each department can have zero or more employees.  
(Allows for both filled and currently empty departments.)
- Each attendance record must be linked to a specific employee.  
(Ensures accountability and tracking of attendance.)
- An employee can have multiple attendance records (one per working day).  
(Supports daily check-ins.)
- Each category name must be unique.  
(Prevents duplicate classifications.)

10. Each employee must have a unique identifier and cannot be null.  
(Supports integrity and identity enforcement.)
11. Each purchase must specify the quantity and date of the transaction.  
(Allows for auditing and reporting.)
12. Only predefined attendance statuses (Present/Absent) are allowed.  
(Maintains data consistency through enumeration.)

### Section 3: ERD



### Section 4: Enhanced ERD



### Section 5: References

1. Lecture Notes – CSE 403 (Database Management Systems)

- Lecture 2: *The Database Development Process*
  - Lecture 3: *Modeling Data in the Organization*
2. dbdiagram.io  
Used to create and visualize the Entity Relationship Diagram (ERD) and Enhanced ERD (EERD).  
URL: <https://dbdiagram.io>
  3. draw.io (diagrams.net)  
Alternate tool for manual ERD/EERD design and exports.  
URL: <https://draw.io>
  4. ChatGPT by OpenAI  
Used for generating and explaining the data model, business rules, and project structure.