**PROJECT NAME: DEPARTMENTAL STORE**

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**DATABASE DESIGN (CMPSC-4213-01)**

# Introduction

This database is designed for a company which has multiple departmental stores at different locations. In this database I have to manage stores inventory, employees working on a specific store, customers, orders and vendors information.

# Database Normalization (1NF, 2NF, 3NF)

A table to be in the 1NF, it should satisfy the following rules:

* It should only have single/atomic valued attributes/columns
* Values stored in a column should be of the same data type/domain
* All the columns of the table should have unique names

A table to be in 2NF, it should satisfy the following rules.

* The table should be in the First Normal form
* The table should not have any Partial Dependency

And a table to be in 3NF, it should satisfy the following rules.

* The table should be in the 2NF
* The table should not have any Transitive Dependency

Tables in our ERD satisfy the rules of 1NF, 2NF as well as 3NF. Our database design is in 3NF. However, if there is any violation of 3NF then It will be stated.

# Normalization Violation

1. I have violated 3NF because Phone number is repeated in Departments and Employees and some other table. The same column is used in many tables it is a violation of 3NF. Phone number is non key attribute. Since, I have a small data base I would like to keep track of small information of my employees in hand.
2. I am violating 3NF of email column because it is repeated in many tables that increases redundancy. It is a non\_key attribute and I would like to put them as a separate because for example if a customer is a valued customer for a long time and a regular customer then I would like to send them a Christmas gift card and same for my departments. Therefore, to have that information is hand I am violating 3NF.

# Business Rules

* There will be multiple stores against a company
* Against a specific store, there will be many departments
* In one department, there will be many employees
* One customer can place multiple orders
* One vendor can supply many products
* Against a specific brand, there will be multiple products
* Any specific product should belong to a specific category
* There can be many products against a single order
* One shipper can ship multiple orders
* There can be multiple payment methods to pay for orders
* Products can have many product orders.
* Store can have many inventories.
* Country can have many addresses.

# Naming Convention

I have used Pascal Naming Convention in this database design. In Pascal Naming Convention the first Letter of each compound word is Capitalize. All table names are in plural form. I did not use characters between the words. Most of the primary key is represented as Id to make naming convention easy.

# Tables and Columns

1.Countries

* Id
* Name

2.Brands

* Id
* Name

3.Product

* Vendors
* ProductNumber
* VendorId
* SupplyQunatity
* SupplyDate
* CostPerUnit

4.Address

* Id
* StreetAddress
* PostalCode
* CityId
* StateId
* CountryId

5.States

* Id
* Name

6.Cities

* Id
* Name

7.Vendors

* Id
* Name
* Phone
* Email

8.Products

* ProductNumber
* Name
* Description
* Price
* AvailableDiscount
* UnitWeight
* BrandId
* CategoryId

9.Inventories

* Id
* ProductNumber
* StoreId
* QuantityInStock
* MinStockToReorder
* UpadtedDate

10.Stores

* Id
* Phone
* FaxNumber
* Email
* AddressId
* CompanyId

11.ProductOrders

* ProductNumber
* OrderId
* Quantity

12.Categories

* Id
* Name

13.Orders

* Id
* Description
* TotalAmount
* DateOfOrder
* Status
* Discount
* PayableAmount
* ShipperId
* PaymentId
* CustomerId

14.Companies

* Name
* Id
* Website
* Email
* Phone

15.StoreDepartments

* StoreId
* DepartmentId

16.Shippers

* Id
* CompanyName
* Email
* Phone

17.Payments

* Id
* Method

18.Customers

* Id
* FirstName
* LastName
* Phone
* Email
* Username
* Password

19.Employees

* Id
* FirstName
* LastName
* Phone
* DateOfBirth
* JoiningDate
* HourlyRate
* AnualSalary
* TaxFileNumber
* IsManager
* IsSupervisor
* AddressId
* DepartmentId

20.Departments

* Id
* Name
* Phone
* Email