Homework 1(Solution)
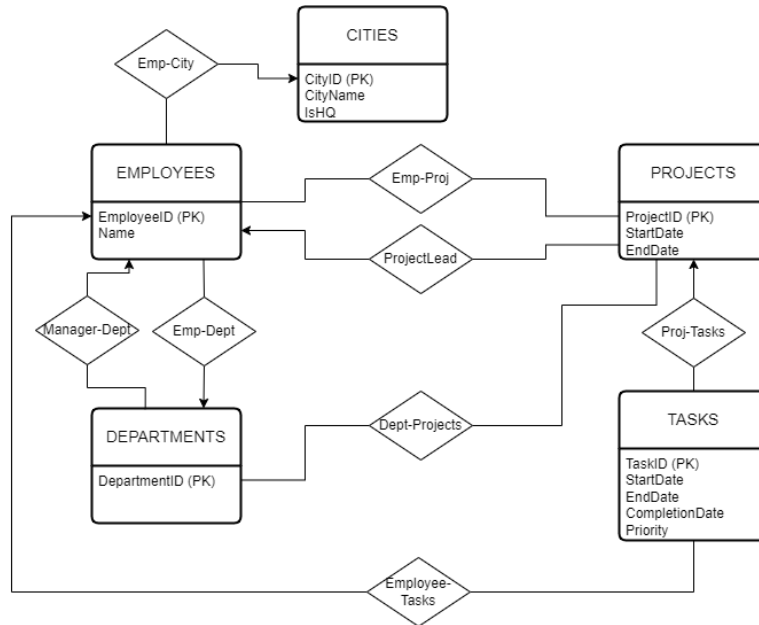
Database Systems
(CS 355 / CE 373)
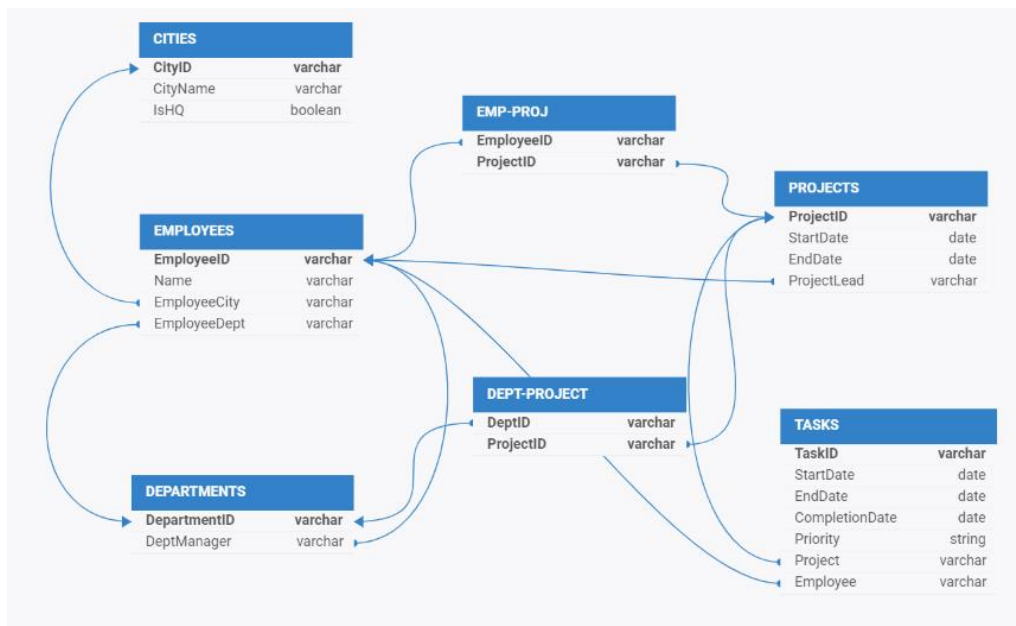
Fall 2024

Question 1

Solution:

ERD

Relation Schema

Question 2

<u>Solution:</u>

<u>1NF:</u>

     SalesOrders (<u>SalesOrderID</u>, <u>ItemID</u>, ItemName, Quantity, UnitPrice, CustomerID,
          CustomerName, CustomerPhone)
     PurchaseOrders (<u>PurchaseOrderID</u>, <u>ItemID</u>, ItemName, Quantity, UnitPrice,
     SupplierID,
          SupplierName, SupplierPhone)

<u>2NF:</u>

     {ItemID} → {ItemName, SupplierID, SupplierName, SupplierPhone}
     {SalesOrderID} → {CustomerID, CustomerName, CustomerPhone}
     {SalesOrderID, ItemID} → {Quantity, UnitPrice}
     {PurchaseOrderID, ItemID} → {Quantity, UnitPrice}

     Items (<u>ItemID</u>, ItemName, SupplierID, SupplierName, SupplierPhone)
     SalesOrders-Customers (<u>SalesOrderID</u>, CustomerID, CustomerName, CustomerPhone)
     SalesOrders (<u>SalesOrderID</u>, <u>ItemID</u>, Quantity, UnitPrice)
     PurchaseOrders (<u>PurchaseOrderID</u>, <u>ItemID</u>, Quantity, UnitPrice)

<u>3NF:</u>

    {SalesOrderID} → {CustomerID} → {CustomerName, CustomerPhone}
    {ItemID} → {SupplierID} → {SupplierName, SupplierPhone}

     Items (<u>ItemID</u>, ItemName, SupplierID)
     Suppliers (<u>SupplierID</u>, SupplierName, SupplierPhone)
     SalesOrders-Customers (<u>SalesOrderID</u>, CustomerID)
     Customers (<u>CustomerID</u>, CustomerName, CustomerPhone)
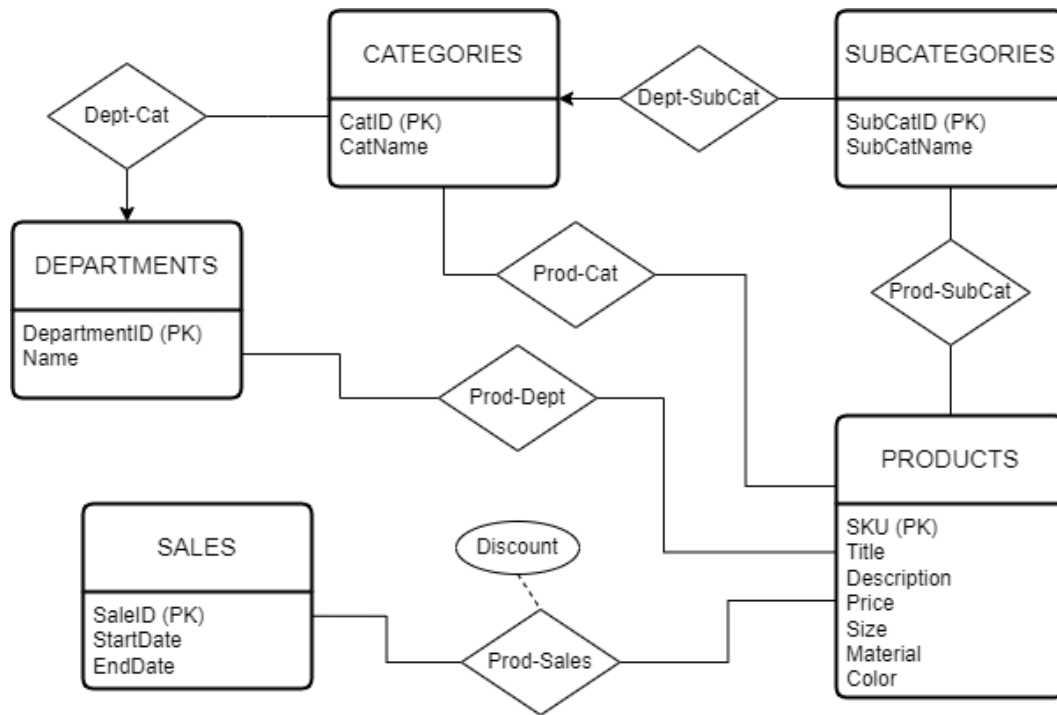   *SalesOrders (<u>SalesOrderID</u>, <u>ItemID</u>, Quantity, UnitPrice)*
     PurchaseOrders (<u>PurchaseOrderID</u>, <u>ItemID</u>, Quantity, UnitPrice)

Question 3

Solution:

ERD

Relation Schema