BCIS 4660
Sample Solutions Homework #4

Chapters 5 & 6 Pratt & Last

Homework Assignment #4

Due: Sec1 Oct 4 (Tu) & Sec 2 Oct 6 (Th)

Points: 20 points

Pratt & Last (End of Chapters 5 & 6)

- **Assignments must have my grade sheet on top and be stapled.**
- **Chapter 5 [pp 174-176; 8th Ed]: Answer questions 1, 2, 3 for TAL and questions 2, 4 for CAT. Turn in:**
  - **1) Functional Dependency "diagrams/charts" &**
  - **2) DBDL (i.e., Relation Lists)**
- **Chapter 6 [pp 220-221; 8th Ed]: Answer questi-ons 2, 4 for TAL and questions 1 and 3 for CAT.**
  - **1) DBDL (or Relation Lists); and**
  - **2) ERDs (i.e., Relationship Diagrams; ERDPlus or Access)**

NAME_____ DAY / EVE Score: _____/20

BCIS 4660 Database Warehouse Concepts
(20 Points)
Homework Assignment #4 Score sheet

Assignment Appearance	**__ Name on Cover page** **__ Table of Contents** **__ Overall appearance**	**± ½** **± ½** **± ½**	**SCORE /-1**
Problem Number	**Functional Dependencies (1 point per question) ± ½ determinants ± ½ attributes/properties;**	**3NF Tables (1 point per question) Or Relations ± ½ each;**	
TAL 5-1			/2
TAL 5-2			/2
TAL 5-3			/2
CAT 5-2			/2
CAT 5-4			/2
Chapter 5	**SUBTOTAL**	Maximum	**/10**
	DBDLs or Relation Lists (1/2 pt per question part)	**ERDs; (1/2 pt each part)**	
TAL 6-2			/2
TAL 6-4			/2
CAT 6-1			/3
CAT 6-3			/3
Chapter 6	**SUBTOTAL**	Maximum	**/10**
	MAX. TOTAL		**/20**

Student Requirements

As per the Grading Form **above**, students will need to produce at least two of each following type of OUTCOME:

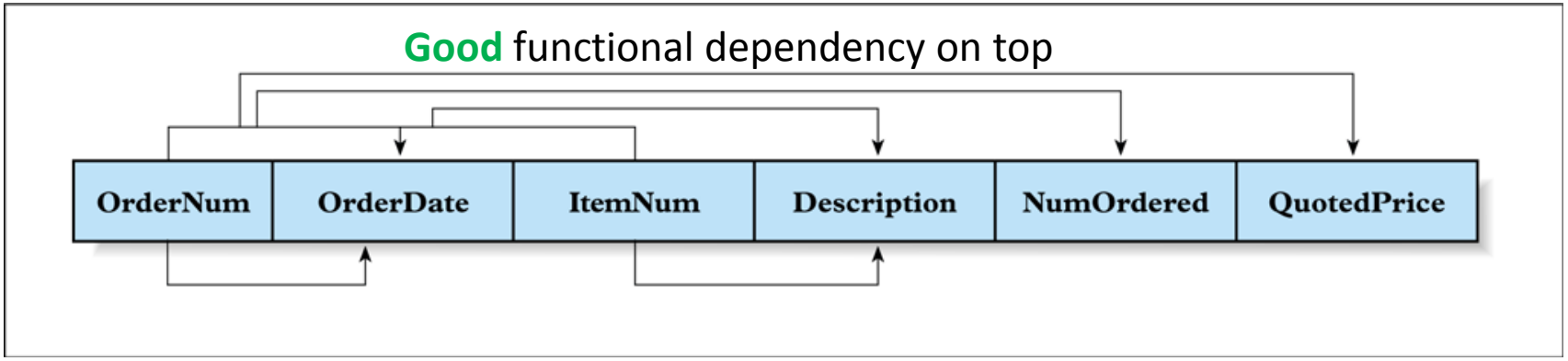
1. Functional Dependency formulas or FD diagram (a.k.a., Data Dependency Diagram)
2. Relation Lists
3. ERD (ERDPlus) or Access Relationship Diagrams

(Examples of all 3 follow below.)

Generally students will use the Functional dependencies to envision **GOOD** relation lists. Then create an ERD for the database.

Functional Dependency Diagram for Orders w/ Sample Functional Dependency Notation

Functional Dependency Diagram (DBDD):

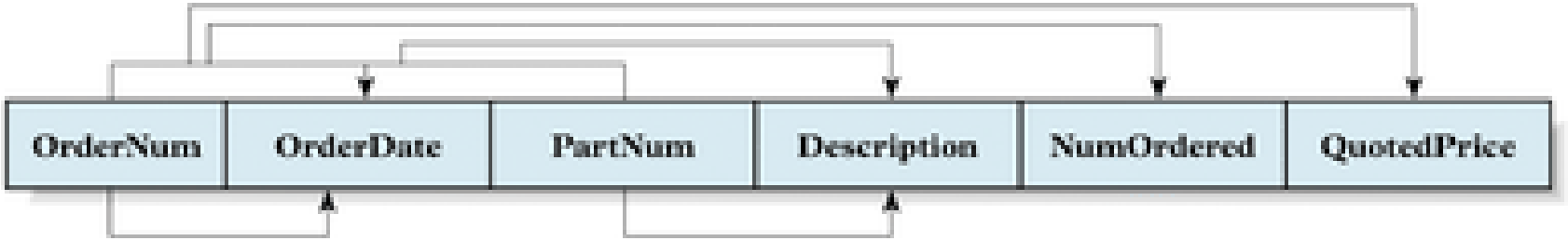


Bad functional dependency on bottom

This is the **Functional Dependence Notation** used in class (All final tables Must be in at least 3rd Normal Form:

Unnormalized 2NF Table ORDERS
Primary Key: (**OrderNum, PartNum**)
F(OrderNum) → OrderDate
F(PartNum) → Description

Chapter 5: Sample Answer #4-1



Functional Dependency Diagram (above; opt.); FD Notation (below):

This is the **Functional Dependence Notation** used in class (All final tables Must be in **at least 3rd Normal Form**:

Primary Key: (**OrderNum, PartNum**)
F(OrderNum, PartNum) ➔ NumOrdered, QuotedPrice

2NF anomalies resolved:
F(OrderNum) → OrderDate
F(PartNum) → Description

Relation Listing:

ORDER[**OrderNum**, OrderDate]

ORDER_DETAIL[***OrderNum***, ***Partnum***, NumOrdered, QuotedPrice]

PART[**PartNum**, Description]

NOTE: All columns accounted for in example.

SAMPLE Relation List (DBDL): REP table; CUSTOMER table

Note: REP & CUSTOMER Relations:

REP [**RepNum**, LastName, FirstName, Street, City, State, Zip, Commission, Rate]

CUSTOMER[**CustNum**, CustLastName, CustFirstName, …, ***RepNum***]

Primary Keys: **Bold and Underlined**

Foreign Keys: ***Italicized and Bold***

Another Example
of
Functional
Dependencies
for **HOLT Industries**

```
CustomerNumber →
                CustomerSoldToName
                CustomerSoldToAddressLine1
                CustomerSoldToAddressLine2
                CustomerSoldToCity
                CustomerSoldToState
                CustomerSoldToZip
                CustomerShipToName
                CustomerShipToAddressLine1
                CustomerShipToAddressLine2
                CustomerShipToCity
                CustomerShipToState
                CustomerShipToZip
                CustomerRepNumber
                CustomerRepLastName
                CustomerRepFirstName

ItemNumber →
                ItemDescription
                ItemPrice

InvoiceNumber →
                InvoiceDate
                CustomerNumber
                OrderNumber
                OrderDate
                ShipDate
                Freight
                InvoiceTotal

InvoiceNumber, ItemNumber →
                ItemQuantityOrdered
                ItemQuantityShipped
                ItemQuantityBackordered
                ItemAmount
```

Tentative List of Entities/Relations
HOLT INDUSTRIES EXAMPLE

Orders
Customer
Rep
Part

Expand into relations
See next page.

Invoice
Customer
Rep
Part
Orders
OrderLine

SAMPLE List of Functional Dependencies w/ RELATIONS

```
CustomerNumber →
          CustomerSoldToName
          CustomerSoldToAddressLine1
          CustomerSoldToAddressLine2
          CustomerSoldToCity
          CustomerSoldToState
          CustomerSoldToZip
          CustomerRepNumber
          CustomerRepLastName
          CustomerRepFirstName

ItemNumber →
          ItemDescription
          ItemPrice

InvoiceNumber →
          InvoiceDate
          OrderNumber
          ShipDate
          Freight
          InvoiceTotal

OrderNumber →
          OrderDate
          CustomerPONumber
          CustomerShipToName
          CustomerShipToAddressLine1
          CustomerShipToAddressLine2
          CustomerShipToCity
          CustomerShipToState
          CustomerShipToZip

OrderNumber, ItemNumber →
          ItemQuantityOrdered (added when or
          ItemQuantityShipped (added during invoicing)
          ItemQuantityBackordered (added during invoicing)
          ItemPrice (added when order is entered)
```

CUSTOMER [**CustomerNumber**, SoldToName, SoldToAddr1, SoldToAddr2, SoldToCity, SoldToState, SoldToZip, ***RepNum***]

REP[**RepNum**, RepLastName, RepFirstName]

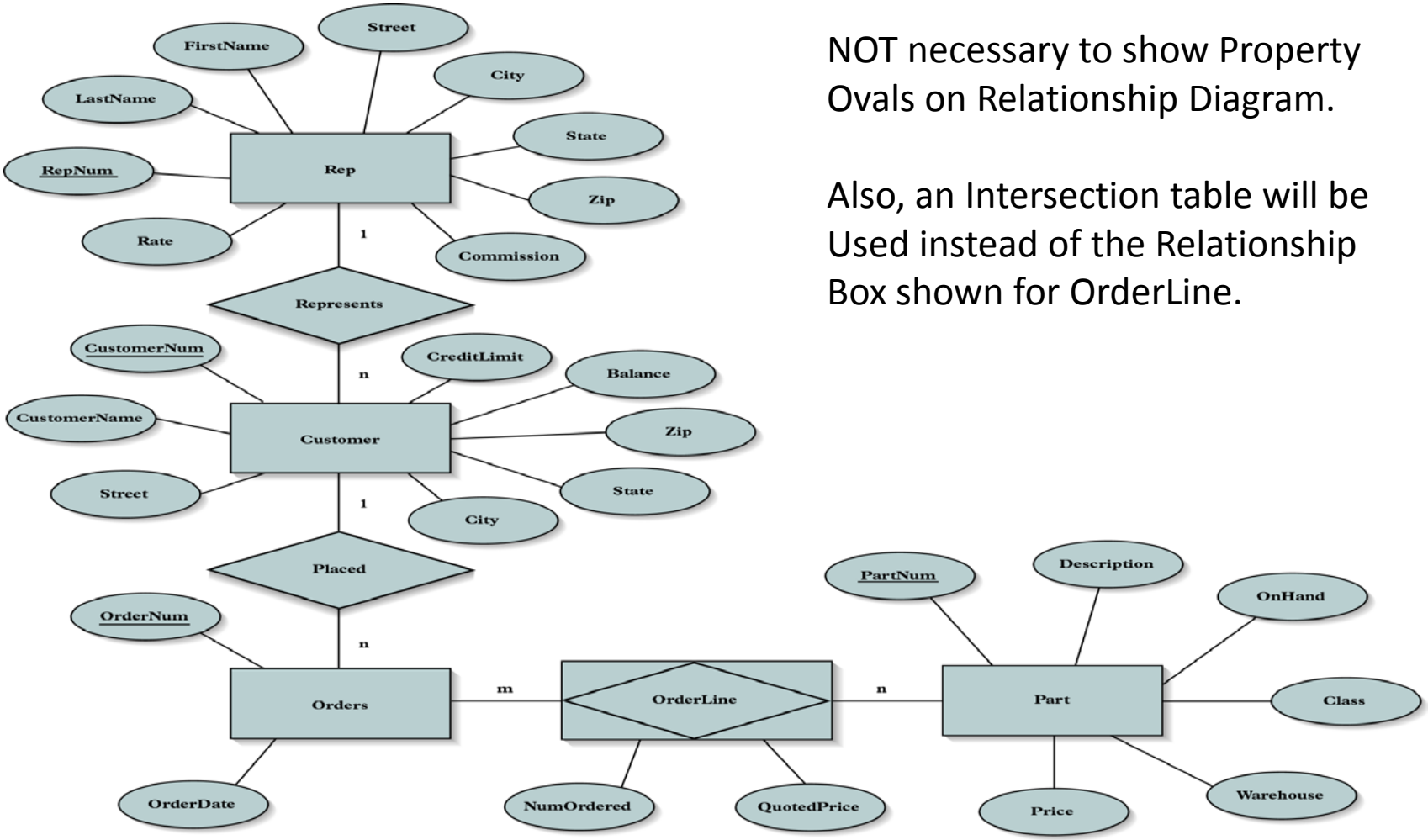
PART [**ItemNum**, ItemDesc, ItemPrice]

INVOICE [**InvoiceNo**, InvDate, OrderNum, ShipDate, Frieght, InvTotal]

Order [**OrderNo**, OrderDate, ***PONum***, ***CustNoShipToNum***, ShipToName, ShipToAddr1, SoldToAddr2, ShipToCity, SoldToState, ShipToZip]

OrderLine [***OrderNum, ItemNum***, QuantityOrdered, QuantityShipped, QuantityBO, ItemPrice]

Complete ERD Diagram;
Students should use ACCESS Relationship Diagram Tool Or ERDPlus Software (ERD option)

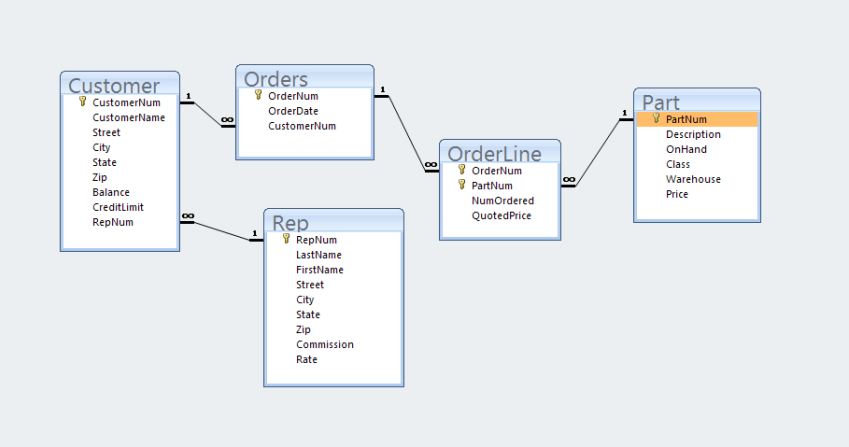


NOT necessary to show Property Ovals on Relationship Diagram.

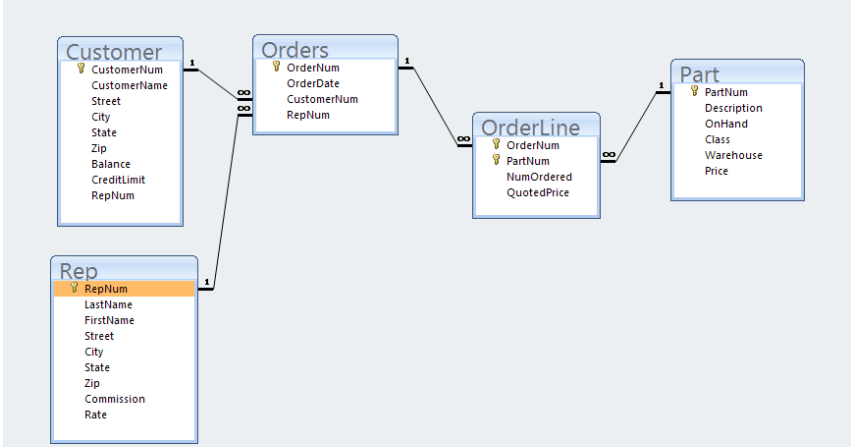
Also, an Intersection table will be Used instead of the Relationship Box shown for OrderLine.

Sample Chapter 6: TAL 6-2.b

ERD/Relationship Diagram
Before: RepNum in Customer



ERD/Relationship Diagram
After: RepNum In ORDERS



Relation Lists (Before)

Customer [**CustomerNum**, …, ***RepNum***]

Rep [RepNum, …]

Orders [**OrderNum**, OrderDate, ***CustomerNum***]

Relation Lists (After)

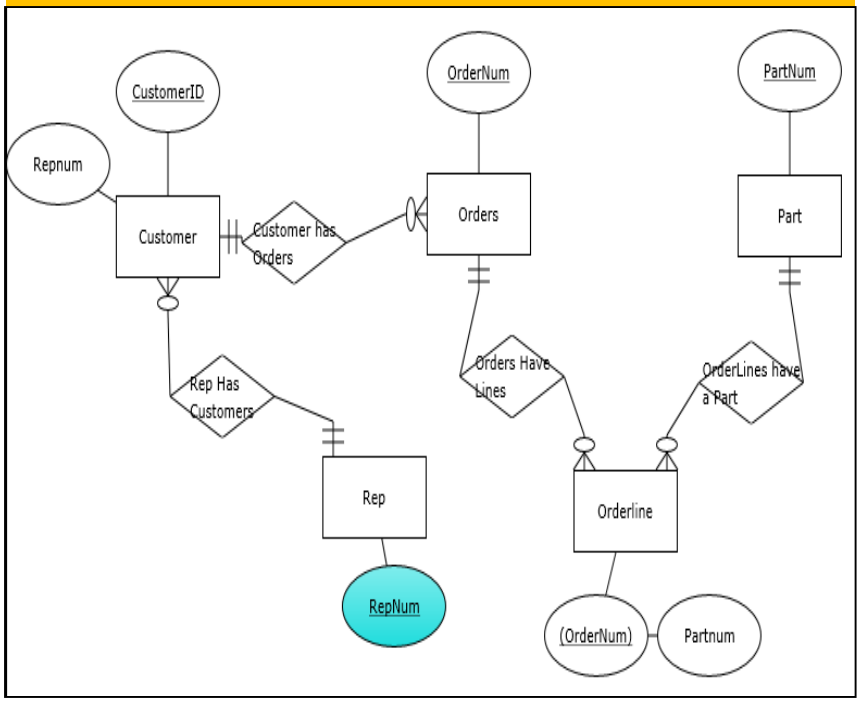
Customer [**CustomerNum**, …,]

Rep [RepNum, …]

Orders [**OrderNum**, OrderDate, ***CustomerNum***, ***RepNum***]

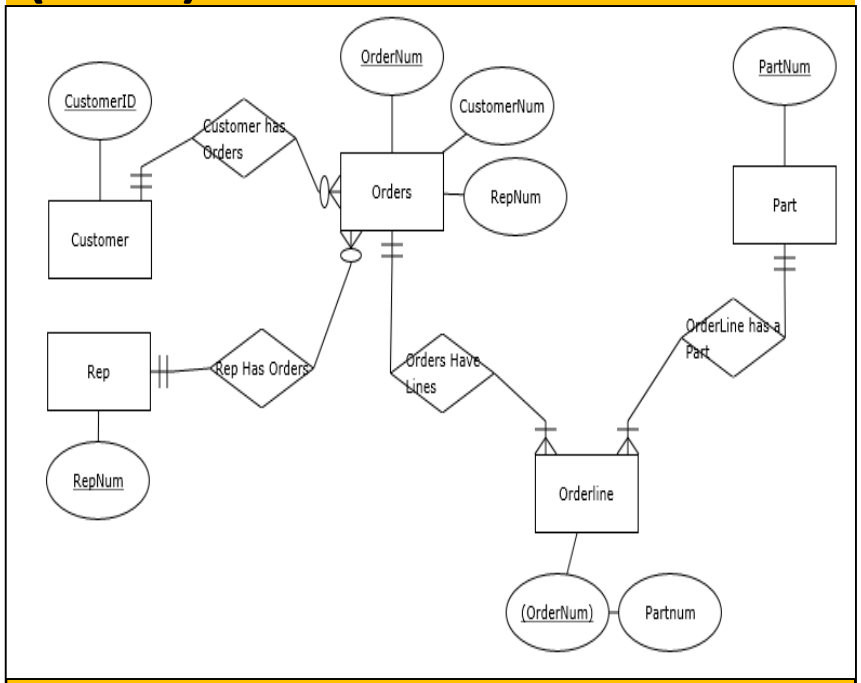
PP 6-2.b ALTER Relationships

ERD Plus; Repnum in Customer (Before; optional)



ERDPlus

ERD Plus; Repnum in Orders (After)



Relation Lists (After)

Customer [**CustomerNum**, …,]

Rep [RepNum, …]

Orders [**OrderNum**, OrderDate, ***CustomerNum***, ***RepNum***]