

Homework # 1

Data Normalization

This homework is worth 70 points (70/1000, or 7%) toward your final grade.

Read the Fairbanks Veterinary Clinic case study (pages 47 – 58) to familiarize yourself with the clinic’s business operations. Then, create 3rd Normal Form Schemas for the business documents on pages 62 and 66 of the Case Study text. This includes the “Animal Record Form” and the “Patient Information Form” documents used by the Fairbanks Veterinary Clinic. Your final 3NF column should show **entities**, **attributes**, **primary keys** and **foreign keys** for all the data appearing in these documents.

Submission

You should present your finished results in a “Spreadsheet” format as provided in the example below that we looked at in class. Please save your spreadsheet as a PDF and submit the PDF via Canvas where the assignment appears in the Week Three materials.

Spreadsheet Template for Results

Record your results in columnar format imitating the spreadsheet template provided. Your spreadsheet should have four columns:

<u>Unnormalized</u>	<u>1st Normal Form</u>	<u>2nd Normal Form</u>	<u>3rd Normal Form</u>
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Begin by listing, for each document, all data elements (“attributes”) on the document in the “unnormalized” column.

List the document name in UPPER CASE and **HIGHLIGHT** it in yellow.

For example:

Unnormalized			
CUSTOMER ORDER			
Order Number			
Order Date			
Delivery Date			
Customer Number			
Customer Name			
Etc.			
Etc.			

After listing all data elements (“attributes”) in the “unnormalized” column for these two documents, then go through the list and put all data into First Normal Form. Replace each document name with an entity name as needed. If an attribute appears on multiple documents (for example, CustomerName), then you should only list it once in your First Normal Form column.

Identify the Primary Keys by highlighting them in a different color other than yellow (as you see in grey in the example below.)

Identify the Foreign Keys by adding a “(FK)” tag after the foreign key attribute name (as you see in the example below.)

Do the same for the second and third normal form columns.

Your final 3NF column should contain all the data in all the documents organized by entity, listing all attributes in each entity with primary keys and foreign keys defined.

If an entity does not change from first to third normal form, then simply copy and paste the data in the second normal form column to show that the data is already in second normal form. HINT: you’ll know this if the entity has an atomic key – that is, NOT concatenated/compound. Without a compound key, the data is already in 2NF.

Example:

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UNNORMALIZED	FIRST NORMAL FORM	SECOND NORMAL FORM	THIRD NORMAL FORM
Customer Order	Customer Order	Customer Order	Order
Order Number	Order Number	Order Number	Order Number
Order Date	Order Date	Order Date	Order Date
Delivery Date	Delivery Date	Delivery Date	Delivery Date
Customer Discount	Customer Discount	Customer Discount	discount amount
discount amount	discount amount	discount amount	invoiced amount
invoiced amount	invoiced amount	invoiced amount	customer number (FK)
customer number	customer number	customer number	order total
customer name	customer name	customer name	
Contact	Contact	Contact	Customer
ContactType	ContactType	ContactType	customer number
bill to address	bill to address	bill to address	customer name
bill to city	bill to city	bill to city	Contact
bill to state	bill to state	bill to state	ContactType
bill to zip	bill to zip	bill to zip	bill to address
ship to address	ship to address	ship to address	bill to city
ship to city	ship to city	ship to city	bill to state
ship to state	ship to state	ship to state	bill to zip
ship to zip	ship to zip	ship to zip	ship to address
--- Product Number	order total	order total	ship to city
Description	OrderProduct	OrderProduct	ship to state
quantity ordered	Order number	Order number	ship to zip
--- unit price	Product Number	Product Number	OrderProduct
order total	Product Description	Quantity	Order number
	Quantity	unit price	Product Number (FK)
	unit price	total	Quantity
		Product	unit price
		Product Number	total
		Product Description	Product
			Product Number
			Product Description