Homework # 1

Data Normalization

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

Create 3rd Normal Form Schemas for the business documents on pages 38 and 40 of your "Case Study" text.   This includes the "Customer Record" and the "Customer Invoice" forms used by the Landscaping company. Your final 3NF column should show entities, attributes and primary 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 Moodle where the assignment appears in the Week Four materials.

Spreadsheet

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

Unnormalized   1st Normal Form   2nd Normal Form   3rd Normal Form

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.)

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 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:

	UNNORMALIZED		FIRST NORMAL FORM		SECOND NORMAL FORM		THIRD NORMAL FORM
1							
2	Customer Order		Customer Order		Customer Order		Order
3	Order Number		Order Number		Order Number		Order Number
4	Order Date		Order Date		Order Date		Order Date
5	Delivery Date		Delivery Date		Delivery Date		Delivery Date
6	Customer Discount		Customer Discount		Customer Discount		discount amount
7	discount amount		discount amount		discount amount		invoiced amount
8	invoiced amount		invoiced amount		invoiced amount		customer number
9	customer number		customer number		customer number		order total
10	customer name		customer name		customer name		
11	bill to address		Contact		Contact		Customer
12	bill to city		ContactType		ContactType		customer number
13	bill to state		bill to address		bill to address		customer name
14	bill to zip		bill to city		bill to city		Contact
15	ship to address		bill to state		bill to state		ContactType
16	ship to city		bill to zip		bill to zip		bill to address
17	ship to state		ship to address		ship to address		bill to city
18	ship to zip		ship to city		ship to city		bill to state
19	Product Number		ship to state		ship to state		bill to zip
20	Description		ship to zip		ship to zip		ship to address
21	quantity ordered		order total		order total		ship to city
22	unit price		OrderProduct		OrderProduct		ship to state
23	order total		Order number		Order number		ship to zip
24			Product Number		Product Number		OrderProduct
25			Product Description		Quantity		Order number
26			Quantity		unit price		Product Number
27			unit price		total		Quantity
28					Product		unit price
29					Product Number		total
30					Product Description		Product
31							Product Number
32							Product Description