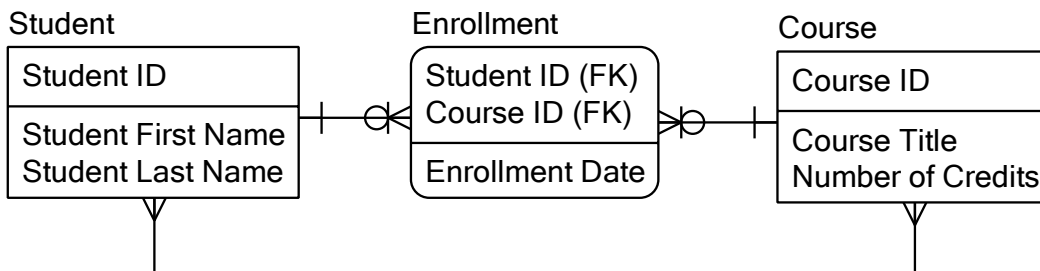


## Instructions for Assignment 1

1. Normalize the 6 user views described below for the “Computer Books Online” company. For each 3<sup>rd</sup> normal form relation, you **must** list all attributes and show the primary key in some distinct way, such as underlining it.
  - a. It is not necessary to submit your intermediate work on each user view.
  - b. It is also not necessary to submit any intermediate work in 1<sup>st</sup> or 2<sup>nd</sup> normal form.
  - c. All you need to submit is your final ERD, which is what I gave you for each of the in-class exercises.
2. Draw an Entity Relationship Diagram for the logical model you have developed via the normalization process. For simplicity, show each normalized relation as a rectangle on the diagram (including any intersection/linking tables you developed to resolve many-to-many relationships), and show only the relationships between primary keys and foreign keys. For example, in the following sample diagram, the many-to-many relationship between Student and Course is unnecessary because it is resolved by the Enrollment intersection entity and the one-to-many relationships that link it to the Student and Course entities:



3. Submit your work on paper in class, or e-mail it to [aoppel@berkeley.edu](mailto:aoppel@berkeley.edu). If you generate the ERD using a specialized software product that the instructor does not have (just ask), please paste the diagram into an MS Word document or create a PDF or other image file of the ERD. Some students use MS Access to draw the ERD (on the Relationships panel) and then submit the MS Access database file (the .mdb file) for grading.

## The Scenario

The user views shown in the next section are for a small Internet-based bookseller. They buy books from publishers and resell them on the Internet.

The primary identifier used for published works is the ISBN (International Standard Book Number). The ISBN-13 standard uses a 13-digit number in the following form:

ISBN-13: III-GG-PPPP-TTT-C

III=Industry code (currently always 3 digits)

GG=Group (number of digits can vary, usually 1 or 2)

PPPP=Publisher (number of digits can vary, usually 3 or 4)

TTT=Serial assigned to title by the publisher (number of digits can vary)

C=Check Digit (always one digit)

## Data Modeling and Database Design: Assignment 1

Note that this is an intelligent key with the publisher number buried in the middle of the string of digits. Over time, publishers end up using multiple publisher numbers because they run out of serial numbers (titles) within a number, or because they merge with or acquire other publishers.

## The User Views

### *Book Catalog*

Subject Code	Subject Description	Title	ISBN	Price	Publisher	Author(s)
DBMS	Database Management Systems	Databases Demystified	978-0-07-225364-1	17.95	McGraw-Hill Education	Andy Oppel
DBMS	Database Management Systems	Banco de Dados Desmistificado	978-85-7608-058-9	17.95	Alta Books (Brasil)	Andy Oppel
DMD	Data Modeling and Design	Data Modeling Essentials	978-0-12-644551-0	39.88	Morgan Kaufmann	Graeme C. Simsion Graham C. Witt
DMD	Data Modeling and Design	Database Design	978-0-672-31758-3	39.99	Sams	Ryan K. Stephens Ronald R. Plew

### *Inventory Report*

ISBN	Title	Author(s)	Edition	Cost	Selling Price	Qty on Hand	Qty on Order	Ideal Stock Qty
978-0-07-225364-1	Databases Demystified	Andy Oppel	1	12.50	17.95	1	1	2
978-85-7608-058-9	Banco de Dados Desmistificado	Andy Oppel	1	12.50	17.95	1	0	1
978-1-57610-872-7	Data Modeling Essentials	Graeme C. Simsion	2	19.00	32.00	1	0	0
978-0-12-644551-0	Data Modeling Essentials	Graeme C. Simsion Graham C. Witt	3	23.75	39.88	3	1	3
978-0-672-31758-3	Database Design	Ryan K. Stephens Ronald R. Plew	1	23.80	39.99	1	0	1

Note: Each edition gets a unique ISBN; Authors and Publishers can change from edition to edition.

Data Modeling and Database Design: Assignment 1

**Customer Orders (Customers buying books from us)**

Customer ID	Name	Address	Order Date	Cancel Date	ISBN	Edition	Quantity	Price
WHEEL11	Helen Wheels	201 Rolling Road Joppa, MD 21045	03/01/08	03/31/08	978-0-12-644551-0	3	2	39.00
					TOTAL		2	78.00
BEAN23	Bernard Beancounter	32767 Forms Blvd, Apt. 12288 Paperwork City, CA 94625	03/04/08		978-0-672-31758-3	1	1	39.99
					978-0-07-225364-1	1	2	17.95
					978-0-12-644551-0	3	1	39.88
					TOTAL		4	115.77

**Customer Sales Invoices (Invoices for books shipped – customers are only billed as items ship)**

Invoice ID	Customer ID	Customer Name	Address	Order Date	ISBN	Edition	Quantity	Price
2008-2735	WHEEL11	Helen Wheels	201 Rolling Road Joppa, MD 21045	03/01/08	978-0-12-644551-0	3	2	39.00
					SALES TAX			0.00
					SHIPPING			4.25
					TOTAL		2	82.25
2008-2736	BEAN23	Bernard Beancounter	32767 Forms Blvd, Apt. 12288 Paperwork City, CA 94625	03/04/08	978-0-672-31758-3	1	1	39.99
					978-0-07-225364-1	1	2	17.95
					978-0-12-644551-0	3	1	39.88
					SALES TAX			8.07
					SHIPPING			0.00
					TOTAL		4	123.84

Data Modeling and Database Design: Assignment 1

**Customer Listing**

<b>Customer ID</b>	<b>Name</b>	<b>Address</b>	<b>Phone</b>	<b>Parent Customer</b>	<b>Balance Due</b>	<b>Balance Past Due</b>
WHEEL11	Helen Wheels	Billing: 201 Rolling Road Joppa, MD 21045  Shipping: Same as Billing	Home: 301-555-3572 Cell: 301-555-2095	n/a	83.25	
BEAN01	Beancounter Enterprises	Billing: P.O. Box 256 Greenbacks, CA 94705  Shipping: n/a  Correspondence: Bart Beancounter, Esq. Tax Writeoff Towers Suite 100 10200 Wilshire Blvd. Los Angeles, CA 90024	Office: 415-555-9432 Cell: 408-555-2903 Pager: 408-555-4721	n/a	42.50	42.50
BEAN23	Bernard Beancounter	Billing: P.O. Box 256 Greenbacks, CA 94705  Shipping: 32767 Forms Blvd, Apt. 12288 Paperwork City, CA 94625	Work: 415-555-1200 x-217 Cell: 201-555-6296	BEAN01	123.84	

Data Modeling and Database Design: Assignment 1

**Purchase Invoices (Books we purchased from publishers)**

<b>Pub. ID</b>	<b>Publisher Name</b>	<b>Address</b>	<b>Order Date</b>	<b>ISBN</b>	<b>Quantity</b>	<b>Price Each</b>	<b>Ext. Price</b>
07	McGraw-Hill Education	160 Spear St. #700 San Francisco, CA 94015	02/01/08	978-0-07-225364-1	2	12.25	24.50
				978-0-07-222885-4	1	15.00	15.00
				TOTAL DUE			39.50
07	McGraw-Hill Education	160 Spear St. #700 San Francisco, CA 94015	02/15/08	978-0-07-225364-1	1	12.50	12.50
				Small Order Charge			4.00
				TOTAL DUE			16.50
12	Morgan Kaufmann	500 Sansome St. Suite 400 San Francisco, CA 94111	02/15/08	978-0-12-644551-0	2	23.75	47.50
				TOTAL DUE			47.50
672	Sams	201 West 103 <sup>rd</sup> St. Indianapolis, IN 46290	02/16/08	978-0-672-31758-3	1	15.00	15.00
				Shipping		3.00	3.00
				TOTAL DUE			18.00

Note: Some publishers charge shipping; others have fees for small orders