

ASSIGNMENT 2

POINTS: 100 TOTAL

Instructions for submitting your assignment:

1. Save this file and remember the location. Please recall the general assignment instructions about where to save the file if you are working on UML [vLabs](#). Use the **MIST** image, not the Learning Commons image (see Course Syllabus for instructions on UML vLabs).
2. Fill in the answers in the space provided.
3. Attach the updated file to your assignment submission.

You can find your graded results in your online Gradebook (My Grades). I typically have all assignments graded **within 1 week** after the assignment due date.

The assignment is to be completed and submitted individually by each student through Blackboard.

You can use [draw.io](#) to create the ER diagram using Crow's foot notation for each of the questions. Export your diagram as a .png image file and insert it in your assignment report (MS Word document).

Instructions for draw.io (Preferred)

See the short YouTube tutorial videos in this [YouTube playlist](#) for getting started.

Instructions for LucidChart

NOTE: These instructions sometimes don't work as expected in all cases, so I recommend using [draw.io](#) instead. But you can give it a try if you wish. Visit <https://www.lucidchart.com/pages/usecase/education> to sign up for an account on LucidChart.com. When creating an account on LucidChart.com, **please make sure to use your UML student (.edu) email ID** so that your email can be automatically verified during the upgrade to a free educational account.

For upgrading your account to a free educational account, follow these steps:

1. Sign up for a free Lucidchart account as shown above and log in to the account.
2. Visit <https://app.lucidchart.com/eduRequests?role=student#> to request an educational account.
3. Then, on the top right corner, click on your account email shown and then click on the **Account Settings** from the drop-down menu.
4. Send yourself a confirmation email
5. Click on the link received in the confirmation email
6. A page should pop up saying you have now been upgraded to an **Educational** account.
 - a. Note: It may give an error at first, but you can copy the link into a different browser and refresh. This should work.
7. Go back to **Account Settings** and it should show under the left menu that you have 1GB of storage which indicates that your account has been upgraded to an Educational account.

If you do not get an educational account, despite using your .edu email account and following the above steps, then send an email to support@lucidchart.com indicating that you have a .edu account, you are a UMass Lowell student and that you would like to request an educational account for your course. The support has a fairly quick turnaround time in my experience.

Instructions for MS Visio

Microsoft Visio is available on UML vLabs. Make sure to log in to the **MIST** vLabs image, not the Learning Commons image (see Course Syllabus for instructions on UML vLabs). Here is a short video on: [How To Use Visio 2016 For Conceptual Data Modeling and ER Diagram](#) (~ 7 min)

Q1. Create a Crow's Foot notation ERD to support the following business context:

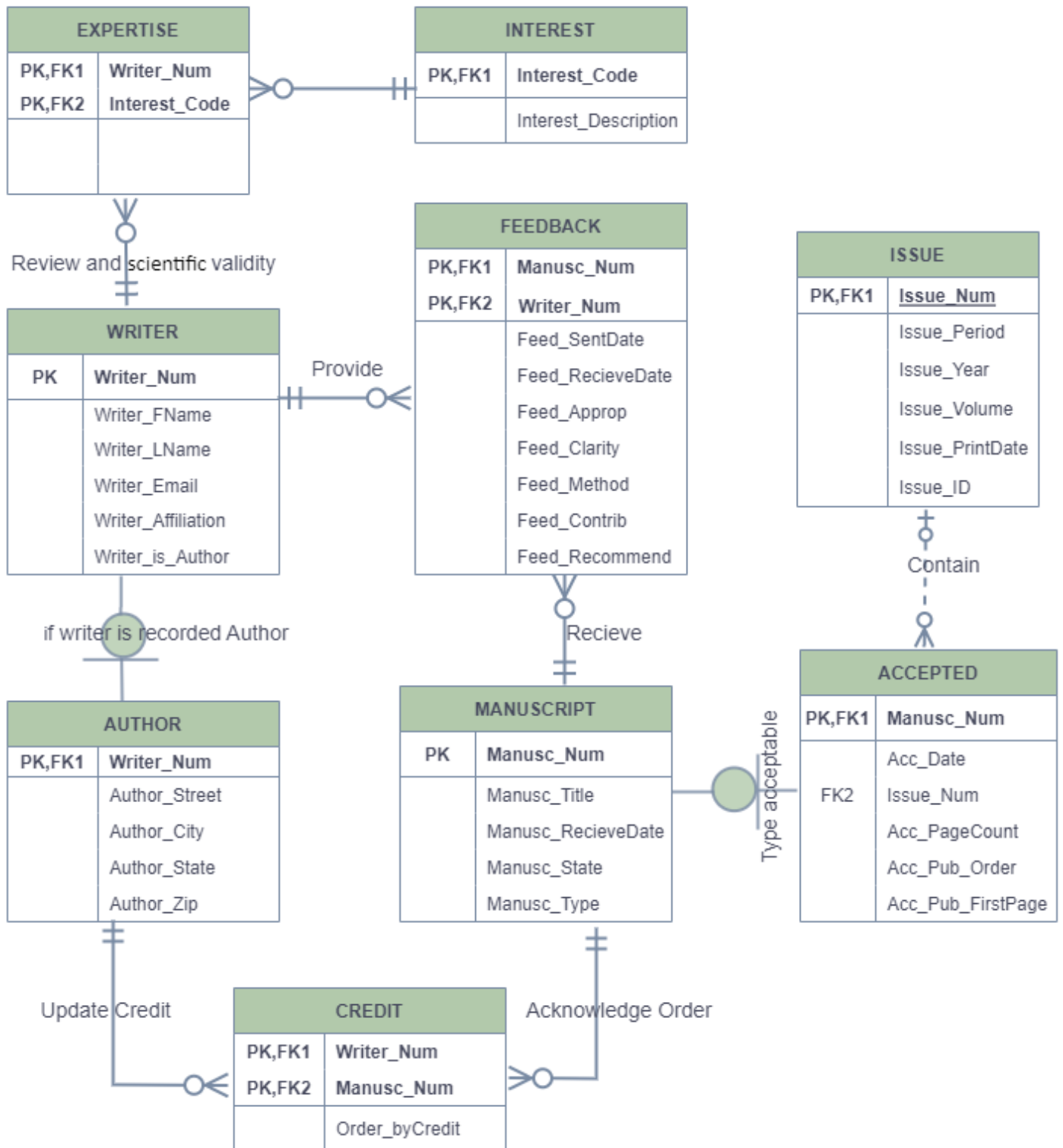
The *Journal of E-commerce Research Knowledge* is a prestigious information systems research journal. It uses a peer-review process to select manuscripts for publication. Only about 10 percent of the manuscripts submitted to the journal are accepted for publication. A new issue of the journal is published each quarter. Create a complete ERD to support the business needs described below.

- Unsolicited manuscripts are submitted by authors. When a manuscript is received, the editor assigns it a number and records some basic information about it in the system, including the title of the manuscript, the date it was received, and a manuscript status of "received." Information about the author(s) is also recorded, including each author's name, mailing address, email address, and affiliation (the author's school or company). Every manuscript must have an author. Only authors who have submitted manuscripts are kept in the system. It is typical for a manuscript to have several authors. A single author may have submitted many different manuscripts to the journal. Additionally, when a manuscript has multiple authors, it is important to record the order in which the authors are listed in the manuscript credits.
- At his or her earliest convenience, the editor will briefly review the topic of the manuscript to ensure that its contents fall within the scope of the journal. If the content is not appropriate for the journal, the manuscript's status is changed to "rejected," and the author is notified via email. If the content is within the scope of the journal, then the editor selects three or more reviewers to review the manuscript. Reviewers work for other companies or universities and read manuscripts to ensure their scientific validity. For each reviewer, the system records a reviewer number, name, email address, affiliation, and areas of interest. Areas of interest are predefined areas of expertise that the reviewer has specified. An area of interest is identified by an IS code and includes a description (e.g., IS2003 is the code for "database modeling"). A reviewer can have many areas of interest, and an area of interest can be associated with many reviewers. All reviewers must specify at least one area of interest. It is unusual, but possible, to have an area of interest for which the journal has no reviewers. The editor will change the status of the manuscript to "under review" and record which reviewers received the manuscript and the date it was sent to each reviewer. A reviewer will typically receive several manuscripts to review each year, although new reviewers may not have received any manuscripts yet.

- The reviewers will read the manuscript at their earliest convenience and provide feedback to the editor. The feedback from each reviewer includes rating the manuscript on a 10-point scale for appropriateness, clarity, methodology, and contribution to the field, as well as a recommendation for publication (accept or reject). The editor will record all of this information in the system for each review received, along with the date the feedback was received. Once all of the reviewers have provided their evaluations, the editor will decide whether to publish the manuscript and change its status to “accepted” or “rejected.” If the manuscript will be published, the date of acceptance is recorded.
- Once a manuscript has been accepted for publication, it must be scheduled. For each issue of the journal, the publication period (fall, winter, spring, or summer), publication year, volume, and number are recorded. An issue will contain many manuscripts, although the issue may be created in the system before it is known which manuscripts will be published in that issue. An accepted manuscript appears in only one issue of the journal. Each manuscript goes through a typesetting process that formats the content, including fonts, font size, line spacing, justification, and so on. Once the manuscript has been typeset, its number of pages is recorded in the system. The editor will then decide which issue each accepted manuscript will appear in and the order of manuscripts within each issue. The order and the beginning page number for each manuscript must be stored in the system. Once the manuscript has been scheduled for an issue, the status of the manuscript is changed to “scheduled.” Once an issue is published, the print date for the issue is recorded, and the status of each manuscript in that issue is changed to “published.”

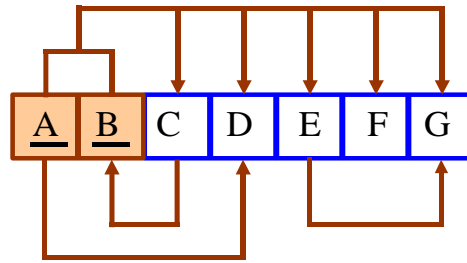
Answer:

Crow's Foot Notation ERD for the Journal of E-commerce Research Knowledge (Dan)



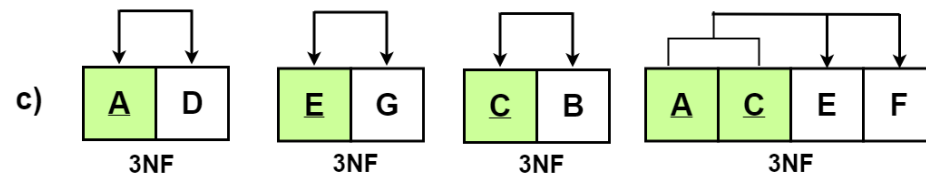
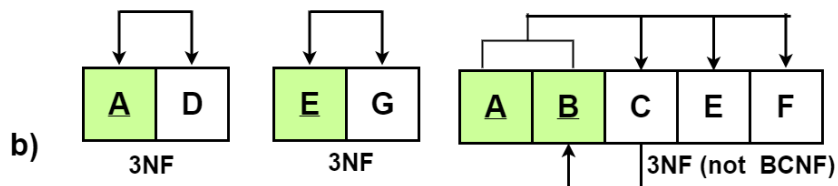
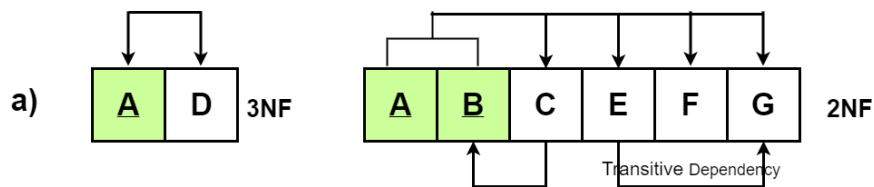
Q2. Use the dependency diagram shown below to work the following problems.

Initial dependency diagram:



- Break up the dependency diagram above to create two new dependency diagrams, one in 3NF and one in 2NF.
- Modify the dependency diagrams you created in part (a) to produce a collection of dependency diagrams that are all in 3NF. (*Hint: One of your dependency diagrams will be in 3NF, but not in BCNF.*)
- Modify the dependency diagrams in part (b) to produce a collection of dependency diagrams that are all in 3NF and BCNF.

Answer:



Q3. Suppose you are given the following business rules to form the basis for a database design. The database must enable the manager of a company dinner club to mail invitations to the club's members, to plan the meals, to keep track of who attends the dinners, and so on.

- Each dinner serves many members, and each member may attend many dinners.
- A member receives many invitations, and each invitation is mailed to many members.
- A dinner is based on a single entree, but an entree may be used as the basis for many dinners. For example, a dinner may be composed of a fish entree, rice, and corn. Or the dinner may be composed of a fish entree, a baked potato, and string beans.

Because the manager is not a database expert, the first attempt at creating the database uses the structure shown in the table below:

Attribute Name	Sample Value	Sample Value	Sample Value
MEMBER_NUM	214	235	214
MEMBER_NAME	Alice B. VanderVoort	Gerald M. Gallega	Alice B. VanderVoort
MEMBER_ADDRESS	325 Meadow Park	123 Rose Court	325 Meadow Park
MEMBER_CITY	Murkywater	Highlight	Murkywater
MEMBER_ZIPCODE	12345	12349	12345
INVITE_NUM	8	9	10
INVITE_DATE	23-Feb-2016	12-Mar-2016	23-Feb-2016
ACCEPT_DATE	27-Feb-2016	15-Mar-2016	27-Feb-2016
DINNER_DATE	15-Mar-2016	17-Mar-2016	15-Mar-2016
DINNER_ATTENDED	Yes	Yes	No
DINNER_CODE	DI5	DI5	DI2
DINNER_DESCRIPTION	Glowing sea delight	Glowing sea delight	Ranch Superb
ENTREE_CODE	EN3	EN3	EN5
ENTREE_DESCRIPTION	Stuffed crab	Stuffed crab	Marinated steak
DESERT_CODE	DE8	DE5	DE2
DESERT_DESCRIPTION	Chocolate mousse with raspberry sauce	Cherries jubilee	Apple pie with honey crust

Given the information in the table above:

- Given the table structure illustrated above, write its relational schema and draw its dependency diagram. Label all transitive and/or partial dependencies. (Note: For this example, you can use the table name and attribute names as given even though they don't strictly follow the relational schema naming conventions given in the notes. You can also create a shortened version of these attribute names if it is easier to work with).
- Break up the dependency diagram you drew in part (a) to produce dependency diagrams that are in 3NF and write the relational schema. (*Hint*: You might have to create a few new attributes. Also, make sure that the new dependency diagrams contain attributes that meet proper design criteria; that is, make sure that there are no multivalued attributes, and so on.)
- Draw the Crow's Foot ERD to reflect the dependency diagrams you drew in Part (b).

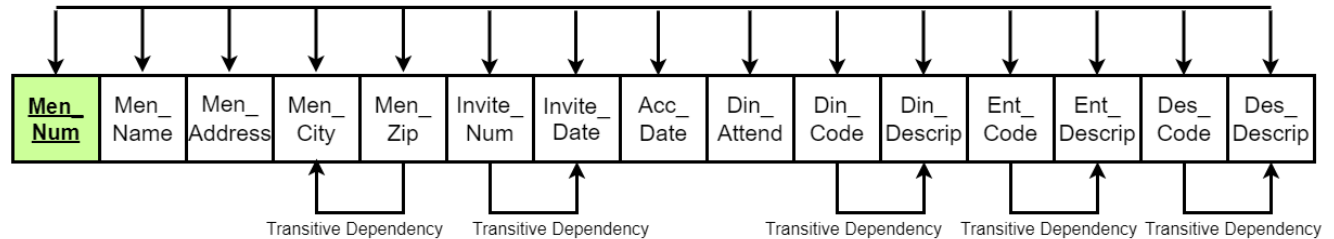
Answer:

a) The relational schema is written as follows:

MEMBER(MEMBER_NUM, MEMBER_NAME, MEMBER_ADDRESS, MEMBER_CITY, MEMBER_ZIP_CODE, INVITE_NUM, INVITE_DATE, ACCEPT_DATE, DINNER_DATE, DINNER_ATTENDED, DINNER_CODE, ENTRÉE_CODE, ENTRÉE_DESCRIPTION, DESSERT_CODE, DESSERT_DESCRIPTION)

Note that DIN_CODE does not determine DIN_ATTEND; just because a dinner is offered does not mean that it is attended.

dependency diagram:



b) The relational schem as follow:

MEMBER(MEM_NUM, MEM_NAME, MEM_ADDRESS, MEM_CITY, MEM_STATE, MEM_ZIP)

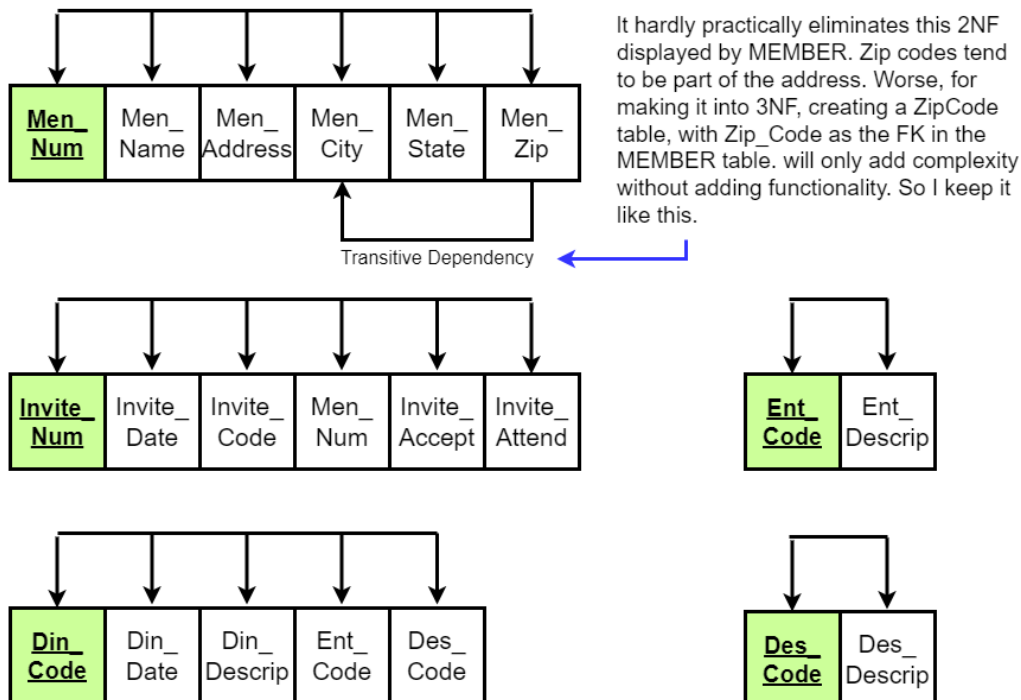
INVITATION(INVITE_NUM, INVITE_DATE, DIN_CODE, MEM_NUM, INVITE_ACCEPT, INVITE_ATTEND)

ENTRÉE(ENT_CODE, ENT_DESCRIPTION)

DINNER(DIN_CODE, DIN_DATE, DIN_DESCRIPTION, ENT_CODE, DES_CODE)

DESSERT(DES_CODE, DES_DESCRIPTION)

Notice: To tracks costs and revenues, it may add appropriate attributes in DESSERT and ENTRÉE. For example, the DESSERT table might include DES_COST and DES_PRICE to enable to track net returns on each dessert served. For keeping track of member balances as the members charge meals and make payments on account. Alos, we can add Num_State. But here, I just want it simply.



c) Draw the Crow's Foot ERD to reflect the dependency diagrams you drew in Part (b).

