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Database Project

Project Outline

We will be creating a database to be used by a fictional local library in Oregon. Libraries must store detailed information about the many different types of informational mediums they possess. Having a spreadsheet or other data store to keep track of all these different sources of information is not very effective, and it would slow down the research process considerably. Using a relational database allows its users to group information together so employees and patrons of the library can efficiently search for related information. This is why we chose this theme for our database. Our database will only store information pertaining to books, but it will provide a glimpse of the utility a relational database provides its users.

Database Outline

The entities in the database are:

Book:
PK=ISBN
- ISBN (bigint) - Required. Unique book identifier obtained and assigned by the publisher. Only one copy of each book is available.
- Title (varchar) - title of the book. Has a maximum length of 100 characters and cannot be blank. There is no default.
- Publisher (varchar) - maximum length is 50 characters. Cannot be blank. No default value.
- Location (varchar) - this will contain the id of the Facility at which the book is located and must be one of the following 3 options. (Main, Burbank or Riverton). Default is Main.

Author:
PK=Author ID
- Author ID (number) - auto generated primary key, cannot be null, and no default
- First Name (varchar) - maximum length is 25 characters. No default. Required.
- Last Name (varchar) - maximum length is 25 characters. No default. Required.
- Home city (varchar) - maximum length is 25 characters. No default.

- Home state (varchar) - maximum length is 25 characters. No default.

Publisher:
PK=Publisher ID
- Publisher ID (integer) - auto generated primary key, cannot be null, and no default
- Company Name (varchar) - Publisher's name. Maximum length is 50 characters. Required. No default.
- Owner (varchar) - Maximum length is 50 characters.
- City (varchar) - maximum length is 25 characters.
- State (varchar) - maximum length is 2 characters. State is identified by its abbreviation.

Facility:
PK=Facility ID
- Facility ID (integer) - auto generated primary key, cannot be null, and no default
- Branch (varchar) - name of the library branch. Maximum length is 25 characters. Required. No default.
- Street Address (varchar) - maximum length is 100 characters. Required. No default.
- City (varchar) - maximum length is 25 characters. Required. No default.
- State (varchar) - maximum length is 2 characters. Required. Default is "OR".
- Capacity (# books) (integer) - maximum value is 10,000,000. No default.

Loan:
PK=Loan ID
- Loan ID - auto generated primary key, cannot be null, and no default
- ISBN (bigint) - contains id of book being loaned. Required. No default.
- Customer (number) - contains id of customer receiving book. Required. No default.
- Loan Date (date) - date the book was loaned to the customer. Required. Default is the date the record is created.
- Due Date (date) - date the book is due back to the library. Required. Default is two weeks from the loan date.
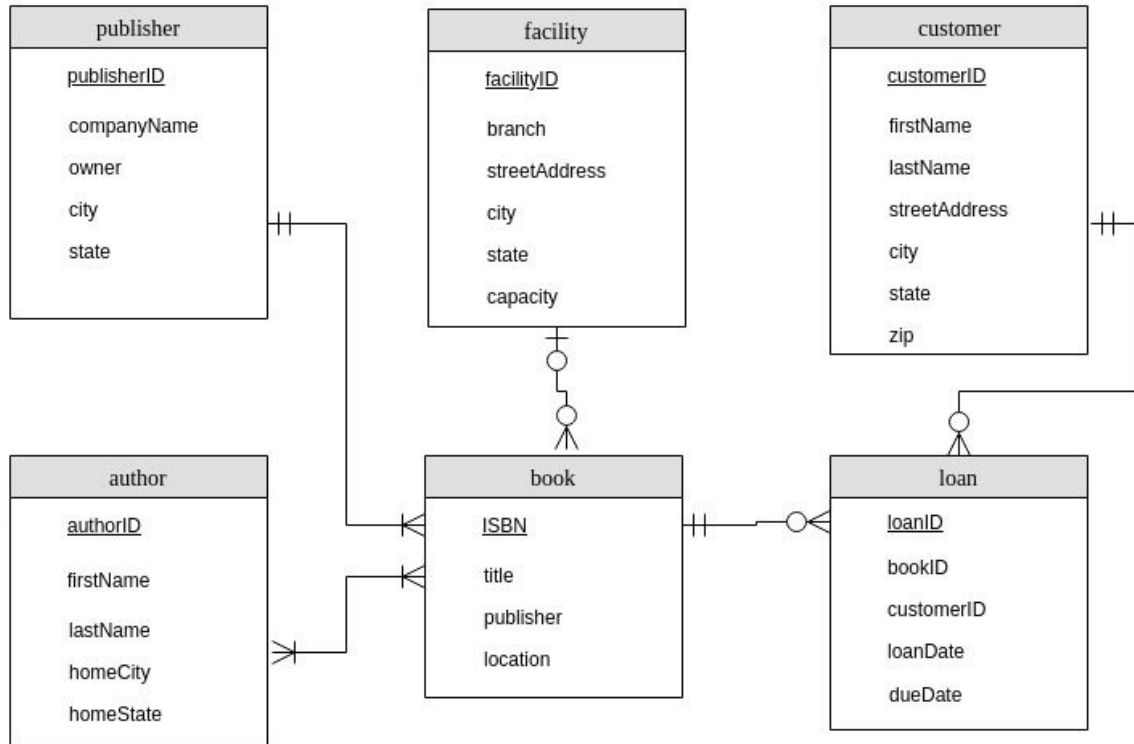
Customer:
PK=Customer ID
- Customer ID (number) - auto generated primary key, cannot be null, and no default
- First Name (varchar) - maximum length is 25 characters. No default. Required.
- Last Name (varchar) - maximum length is 25 characters. No default. Required.
- Street Address (varchar) - maximum length is 50 characters. No default. Required
- City (varchar) - maximum length is 25 characters. Required. No default.
- State (varchar) - maximum length is 2 characters. Required. Default is "OR".
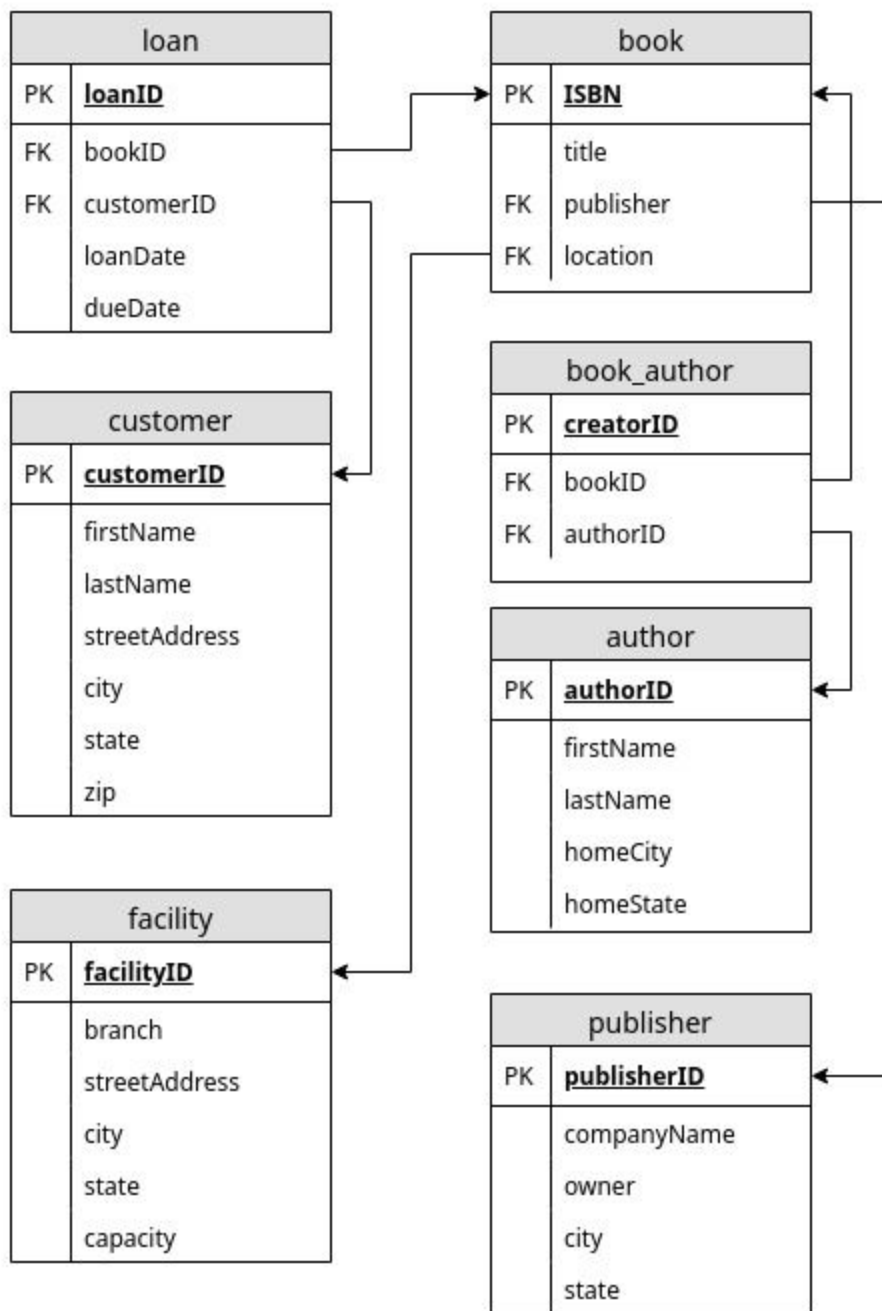- Zip (varchar) - maximum length is 5 digits. Required. No default.

The relationships in the database are:

- A book can have many authors, and an author can write many books. (Many-to-many)
- A facility can have many books, but a book can have only one facility. (One-to-many)
- A book is produced by one publisher, but a publisher produces many different books. (One-to-many)
- A loan must be to one customer, but a customer may have many loans. (One-to-many)
- A loan is for one book, but a book can be loaned many times. (One-to-many)

C. Entity-Relationship Diagram

publisher

- *publisherID*
- companyName
- owner
- city
- state

facility

- *facilityID*
- branch
- streetAddress
- city
- state
- capacity

customer

- *customerID*
- firstName
- lastName
- streetAddress
- city
- state
- zip

author

- *authorID*
- firstName
- lastName
- homeCity
- homeState

book

- *ISBN*
- title
- publisher
- location

loan

- *loanID*
- bookID
- customerID
- loanDate
- dueDate

D. Schema

loan

PK	loanID
FK	bookID
FK	customerID
	loanDate
	dueDate

book

PK	ISBN
	title
FK	publisher
FK	location

customer

PK	customerID
	firstName
	lastName
	streetAddress
	city
	state
	zip

book_author

PK	creatorID
FK	bookID
FK	authorID

author

PK	authorID
	firstName
	lastName
	homeCity
	homeState

facility

PK	facilityID
	branch
	streetAddress
	city
	state
	capacity

publisher

PK	publisherID
	companyName
	owner
	city
	state

Feedback from Draft Version Step 2

Yanhao Huang

ERD

1. The attributes in the ERD are the same as that described in the outline

2. The participation of entities are the same as that described in the outline

3. The cardinality of entities are the same as that described in the outline

4. There are no relationships that are better described as an Entity

5. The ER Diagram and the database looks good

Schema

1. The relationship tables are consistent with the database outline

2. The foreign keys are consistent with the database outline

3. Theres 2 First_name attributes in the Author table, all other entity attributes match the outline

4. The Schema and the database looks good

Miao Pan

1.   Are the attributes for each entity in the ERD same as that described in the database outline? Yes

2.   Is the participation of entities in the relationships same as that described in the outline? It's mentioned in the description that "A loan must be to one customer, but a customer may have many loans. (One-to-many)". In the ERD, the diagram indicates a customer can have 0 or more loans. I think it's correct that it's a one-to-many relationship, but it would be clearer if in the description it's stated that the participation could be 0.

3.   Is the cardinality of entities in the relationships same as that described in the outline? yes.

4.   Based on the Database outline, could any of the relationships be better off described as an Entity ? No.

5.   Is there something that could be changed/improved in the E R Diagram and/or the overall database design? It looks pretty good.

1.   Are the relationship tables present where required and correctly defined, when compared with the database outline? yes.

2.   Are foreign keys present where required and correctly defined, when compared with the database outline? yes foreign keys are present

3.   Do the entity attributes match those described in the outline? yes

4.   Is there something that could be changed/improved in the Schema and/or the overall database design? No it looks good.

James Wise

1.   Are the attributes for each entity in the ERD same as that described in the database outline?

Yes. All of the attributes are present

2.   Is the participation of entities in the relationships same as that described in the outline?

Yes, all of the relationships are described.

3.   Is the cardinality of entities in the relationships same as that described in the outline?

Yes.

4.   Based on the Database outline, could any of the relationships be better off described as an Entity instead ?

No. A library application such as this doesn't really have complex relationships that could be entities instead

5.   Is there something that could be changed/improved in the E R Diagram and/or the overall database design?

I am curious how you will be showing how a customer is going to be related to a facility to determine where and when a book needs to be returned. If the load is based on the isbn, and 2 or more facilities have the same book (ISBN), the system will not know where the book needs to be returned to by the customer, or if they return to the wrong location, how can the system tell.

Another point I was thinking of, what if a author has a publisher change, or has different publishers for different types of books? I know that authors do have different publishers for different regions of the world that the book is released in.

1.   Are the relationship tables present where required and correctly defined, when compared with the database outline?

Yes 2. Are foreign keys present where required and correctly defined, when compared with the database outline?

Yes, all keys are present

3.   Do the entity attributes match those described in the outline?

Yes.

4.   Is there something that could be changed/improved in the Schema and/or the overall database design?

The schema looks good

Lifang Yan

ERD

1.   Are the attributes for each entity in the ERD same as that described in the database outline? Yes
2.
3.   Is the participation of entities in the relationships same as that described in the outline? Yes
4.   Is the cardinality of entities in the relationships same as that described in the outline? Yes
5.   Based on the Database outline, could any of the relationships be better off described as an Entity instead ? No
6.   Is there something that could be changed/improved in the E R Diagram and/or the overall database design? No

Schema

1.   Are the relationship tables present where required and correctly defined, when compared with the database outline? Yes
2.   Are foreign keys present where required and correctly defined, when compared with the database outline? Yes
3.   Do the entity attributes match those described in the outline? Two first name included in AuthorTable.
4.   Is there something that could be changed/improved in the Schema and/or the overall database design? No

Feedback from Step 4 Draft

Chris Kuchman 9 days ago

- CREATE functionalities
  - Does the INSERT form actually work for entities and relationships, as required in the Specs?
  - Yep, all new entries seem to generate properly.
  - Does INSERTing rows in the "M entity" of the 1-to-M relationship rows affect the INSERTing of rows in the "1 entity"?
  - There are proper dropdown menus of added many options, well done!
  - Does INSERTing rows in the "M entity" of the M-to-M relationship rows affect the INSERTing of rows in the other "M entity"?
  - Not directly as the M-to-M relationship is added separately (not on insert). This doesn't seem like a direct requirement.
  - Anything else that you think is important for the CREATE functionalities and could be improved?
  - There is a good number of blanks in entries, it might be worth making sure that something was inputted.
- READ functionalities
  - Are rows being listed for all relationships, as described in the Specs?
  - It appears so based on the ERD.
  - Is there a better way that data could be displayed on these pages? OR Could the style of the webpage be improved?
  - A back button to the index would be nice. Also it would be good to display the publishes name for the books instead of the ID, same for location.
  - Anything else that you think is important for READ functionalities and could be improved?
  - I think it generally looks good, I like the styling of the table itself.
- UPDATE functionalities
  - Is the UPDATE functionality properly implemented for at least one entity?
  - Yes, it seems to update right on the customers page

- - What is the effect of this UPDATE on the relationships that the
      entity is participating in ?
    - Nothing visible as none of the customers attributes show on the
      loan page.
    - What is the effect of CREATE and DELETE operations on the
      other entities that are participating in the relationship with this
      entity?
    - The customer has no relations with update/delete capabilities
    - Anything else that you think is important for the UPDATE
      functionality?
    - Nothing stands out, this works well.
- DELETE functionalities
    - Does DELETE work as required by the Project Guide AND as
      defined by the Project Outline?
    - The many-to-many doesn't delete the entries which is good. The
      one-to-many does, which is also alright I think?
    - (I leave it to your judgment to determine what other things are
      important to review for DELETE functionalities.)
    - Right now I can't set the one-to-many relationship to NULL, so
      that requirement may be missing.

Helen Tran 6 days ago

CREATE functionalities

Does the INSERT form actually work for entities and relationships, as required in the
Specs?

- Yes

Does INSERTing rows in the "M entity" of the 1-to-M relationship rows affect the INSERTing
of rows in the "1 entity"?

- Yes

Does INSERTing rows in the "M entity" of the M-to-M relationship rows affect the
INSERTing of rows in the other "M entity"?

- Yes

Anything else that you think is important for the CREATE functionalities and could be improved?

- Home State attribute takes in string input, maybe have a drop down menu of all state options.

READ functionalities

Are rows being listed for all relationships, as described in the Specs?

- Yes

Is there a better way that data could be displayed on these pages? OR Could the style of the webpage be improved?

- No, I think it looks good!

Anything else that you think is important for READ functionalities and could be improved?

- Nope

UPDATE functionalities

Is the UPDATE functionality properly implemented for at least one entity?

- Yes it works

What is the effect of this UPDATE on the relationships that the entity is participating in ?

- Nothing

What is the effect of CREATE and DELETE operations on the other entities that are participating in the relationship with this entity?

- Nothing

Anything else that you think is important for the UPDATE functionality?

- Nope, site looks great

DELETE functionalities

Does DELETE work as required by the Project Guide AND as defined by the Project Outline?

- Yes

Alexander Ghafourian 6 days ago

Does the INSERT form actually work for entities and relationships, as required in the Specs?

Yes, I added a book successfully.

Does INSERTing rows in the "M entity" of the 1-to-M relationship rows affect the INSERTing of rows in the "1 entity"?

Not that I can see

Does INSERTing rows in the "M entity" of the M-to-M relationship rows affect the INSERTing of rows in the other "M entity"?

No, not that I can see

Anything else that you think is important for the CREATE functionalities and could be improved?

I thought it looked great.

Is the UPDATE functionality properly implemented for at least one entity?

It updates on customer page

What is the effect of this UPDATE on the relationships that the entity is participating in ?

I did not see any attributes added when the relationship was formed.

What is the effect of CREATE and DELETE operations on the other entities that are participating in the relationship with this entity?

They seem to work fine. I was able to edit attributes.

Anything else that you think is important for the UPDATE functionality?

No, I thought what they had was fine.

Does DELETE work as required by the Project Guide AND as defined by the Project Outline?

Yes, I believe so. I was able to delete entries in the customer table.

Junze Zhang 6 days ago

Does the INSERT form actually work for entities and relationships, as required in the Specs?

Yes.

Does INSERTing rows in the "M entity" of the 1-to-M relationship rows affect the INSERTing of rows in the "1 entity"?

No.

Does INSERTing rows in the "M entity" of the M-to-M relationship rows affect the INSERTing of rows in the other "M entity"?

No.

Anything else that you think is important for the CREATE functionalities and could be improved?

Looks good, but cannot see m-to-m 1-to-m.

Is the UPDATE functionality properly implemented for at least one entity?

Yes.

What is the effect of this UPDATE on the relationships that the entity is participating in ?

Nothing

What is the effect of CREATE and DELETE operations on the other entities that are participating in the relationship with this entity?

Nothing.

Anything else that you think is important for the UPDATE functionality?

No, it looks good.

Does DELETE work as required by the Project Guide AND as defined by the Project Outline?

Yes.

Glen Gougeon 6 days ago Since Everyone wanted to beat me with their short answers..this is worth zero...but I spent 1.5 hours on it..so here you go.

CREATE functionalities

Does the INSERT form actually work for entities and relationships, as required in the Specs?

Add Author. Pre-populated, Adds Author to list below. Could use a drop down for state, but follows 2 letter specs.

Add Book. Pre-populated, Adds Book, requires ISBN (not listed as req'd. in outline...minor detail)

I think...ALLOWS SAME ISBN FOR DIFFERENT BOOKS.

Book_Authors. Adds correctly, but having the Book.title would be helpful

Add Customer. Pre-populated, 2 letter state, 5 number zip. Follows all constraints as described. All req'd. fields.

Add Loan. Lloyd can check out the same book twice. Otherwise okay.

Add Publisher. CAN ADD WITH CO. NAME ONLY...not to specs. State req'd. (ID also req'd...but that is auto-gen..so you are okay there)

Add Facility. CAPACITY WANTS 5 DIGIT ZIP CODE. oops.

Does INSERTing rows in the "M entity" of the 1-to-M relationship rows affect the INSERTing of rows in the "1 entity"?

If you try to add the same book to a different location, you get a default server error, which is probably what

you want, but an alert message, might be better. I tried to duplicate for the test, but couldn't remember the

exact publisher, or location numbers. You would have to re-test this yourself to make sure.

Does INSERTing rows in the "M entity" of the M-to-M relationship rows affect the INSERTing of rows in the other "M entity"?

If you add or delete from Book_Authors, the changes are not reflected in Books or Authors.

Anything else that you think is important for the CREATE functionalities and could be improved?

1. You have the state field as a max 2 varchar, which is fine, but you might

consider using your drop_down functionality from Add BookId, or AuthorId for selecting the state.

2. Req'd. ISBN not specified in Outline, but IS implemented in WebSite.

Good implementation, but add spec to outline description.

READ functionalities

Are rows being listed for all relationships, as described in the Specs?

I think so.

Is there a better way that data could be displayed on these pages? OR Could the style of the webpage be improved?

Layout is generally very good. I found that I wanted a drop-down for the states selections.

I also noticed that it was difficult to cross-check which book_authors entities I was deleting,

and which publisher a book had. For the assignment, I get the ease of the number, but the name

would be more helpful...up to you.

Anything else that you think is important for READ functionalities and could be improved?

A search for a book, as is common with most Libraries would be great. (Simplified of course)

UPDATE functionalities

Is the UPDATE functionality properly implemented for at least one entity?

Yes. Good Job. It changes.

What is the effect of this UPDATE on the relationships that the entity is participating in ?

That...is difficult to tell, because it is on the Customer. The only other reference is to

their ID, but the update doesn't seem to change the dates, or their identity in loans page.

What is the effect of CREATE and DELETE operations on the other entities that are participating in the relationship with this entity?

As mentioned previously, Deleting a Book_Author, doesn't delete the Book or Author. Likewise adding

to Book or Author, isn't reflected in Book_Author.

DELETE functionalities

Does DELETE work as required by the Project Guide AND as defined by the Project Outline?

(I leave it to your judgment to determine what other things are important to review for DELETE functionalities.)

Here's some of the Spec From Project Guide:

In a many-to-many relationship, to remove a relationship one would need to delete a row from a table. That would be the case with

bsg_people and bsg_certifications. One should be able to add and remove certifications for a person without deleting either bsg_people rows

or bsg_certification rows. If you implement DELETE functionality on at least (1) many-to-many relationship table, such that the rows in the

relevant entity tables are not impacted, that is sufficient.

The requirement is confusing, but here's what I know. I deleted ALL Book_Author relationships, and all of

your Books and Authors remain. I would think that deletion WOULD affect those other entities...but you

would want to think about the logic again. Maybe there is a way to completely remove an author, if there

are no more books in the Library by that author. To me it seems like you would want to affect both, but

the specs I included above lead one to believe they should not be affected. I am not sure what to advise,

but there it is.

Fixes from step 2 draft version

-We were instructed to change all of our string variables to variables of type varchar, so we made these changes in the Database project outline, The changes are reflected in the new outline below.

-We removed the author from the book entity. With a many-to-many relationship, it no longer makes sense from a design perspective to have the author entity inside the book table.

-Changed the book attribute ISBN to a bigint. The ISBN would not fit in an int

-Changed to lower camel case naming convention

-Added the edit and delete functionality

-Added option to delete a many-to-many relationship (book_author entry)

-Changed HTML fields to match the data types of the database

We made some changes to the project - Step 2 based on feedback from the discussion. Firstly, we had accidentally created two "First Name" fields in the Author table, so we removed the additional instance of "First Name". Secondly, we removed the relationship between author and publisher, as this is a redundant

relationship. The book and publisher have a one to many relationship, so this is sufficient, as a book is tied to a publisher or publishers, but an author is not necessarily tied to one publisher or publishers.

Upgrades to Draft Version

-Removed second "first name" attribute from author table

-Removed relationship between author and publisher

Fixes from Draft Version - Step 4

We added a search functionality to the Book table. A user can now search for a book based on title. This required an additional controller method, as well as an additional SQL query to be created in order to properly render on the page the books that meet the search criteria. We also fixed some bugs related to styling from the .css files we are using. We are happy with the feedback we got from our peers on this wosk, as they pointed out some things that we missed during our implementation of the website.

We also added functionality to allow a one to many relationship to have a null value. Specifically, a book can now handle having a null value for location.