

Book Relation

Attribute	Data	Constraint
Title	Text (up to 60 characters)	Not null constraint because a book must have a title
Author	Text (up to 40 characters)	Some works have no author so the not null constraint would not be appropriate
ISBN_number	Text	The ISBN number combined with the sequence number uniquely identifies a book Not null constraint as this attribute is used as part of the primary key Unique constraint as it is a part of the primary key and as such must be unique.
Publicationdate	Date	Semantic integrity constraint because this is a date and the date must be valid (note this is not required in your peers assignment)
Cost	number	Semantic integrity constraint the cost should only be a positive number (note this is not required in your peers assignment)
sequence		Combined with the ISBN_number this is part of the primary key so it requires the Unique constraint and the not null constraint

Borrower Relation

Attribute	Data	Constraint
Library card #	number	The library card # uniquely identifies a borrower as such it requires: Not null constraint as this attribute is used as part of the primary key Unique constraint as it is a part of the primary key and as such must be unique.
Name	Text	Name is a required field as it identifies the borrower as such it will require the not null constraint
Address	Text	A borrower may or may not have an address so no

		constraint is required
Postal Code	Text	Postal codes vary around the world so we will not impose a constraint for semantics on the field.
PhoneNumber	number	The phone number has a specific format that should be validated using a semantic constraint (this is not required in your peers assignment)
Membership Date	Date	The member ship date has a specific format that should be validated using a semantic constraint (this is not required in your peers assignment)

BookLended Relation

Attribute	Data	Constraint
Borrower	Text	<p>We need a constraint to ensure that no person checks out a book who is not first a borrower in the library system. To ensure this borrower is a foreign key to the borrower relation and requires a referential integrity constraint.</p> <p>Who can see the problem that we have here?</p> <p>In this case the value is required as it is also a part of the primary key of the borrower booklended relation so the value must not contain a null (null constraint) and the primary key that it belongs to must be unique (unique constraint)</p>
CheckoutDate	Date	Checkout date is a part of the primary key of the relation which means that the primary key elements must be unique (unique constraint) this value cannot be null (not null constraint).
ReturnDate	Date	The return date has a specific format that should be validated using a semantic constraint (this is not required in your peers assignment)
Book	Text	<p>We need a constraint to ensure that no person checks out a book that is not a part of the library's collection. To ensure this book is a foreign key to the book relation and requires a referential integrity constraint.</p> <p>Who can see the problem that we have here that is similar to the borrower relation?</p> <p>In this case the value is required as it is also a part of the primary key of the booklended relation so the value must not contain a null (null constraint) and the primary key that it belongs to must be unique (unique constraint)</p>

		constraint)
Librarian	Text	<p>We need a constraint to ensure that no person checks out a book that is not a member of the library staff (a librarian). The librarian must be validated to ensure that it is a valid librarian that exists in the librarian relation. Librarian then is a foreign key for the librarian relation and as such will require a referential integrity constraint with the librarian relation.</p> <p>Who can see the problem that we have here that is similar to the borrower relation?</p>

HINT: The problem that we have with the foreign keys in this relation is that they do NOT match the primary keys in the relations that they are referenced to. For example the primary key for the librarian relation is the librarian id. In the case of the book reference we simply have a value 'book' in this booklended relation. We know that book is uniquely identified by the ISBN_number and the sequence. The foreign key in the booklended relation then should be ISBN_number and sequence and the referential integrity constraint should be applied against these attributes. DO NOT worry if you didn't get this yet. Most of these kinds of issues are what will be identified in the process of NORMALIZATION that we will learn about in unit 4.

Librarian Relation

Attribute	Data	
Librarian Id	Number	The librarian id number uniquely identifies a librarian. This means that this attribute must have the null constraint because no attribute in the primary key can be null. It also must have unique constraint because the primary key identifier of a tuple must be unique.
Name	Text	The name should have not null constraint because a librarian must have a name.
Phone Number	Number	The phone number should have a semantic constraint to ensure that a properly formatted phone number is stored. This field can have a null value because not every librarian will have a phone number. (this is not required in your peers assignment)