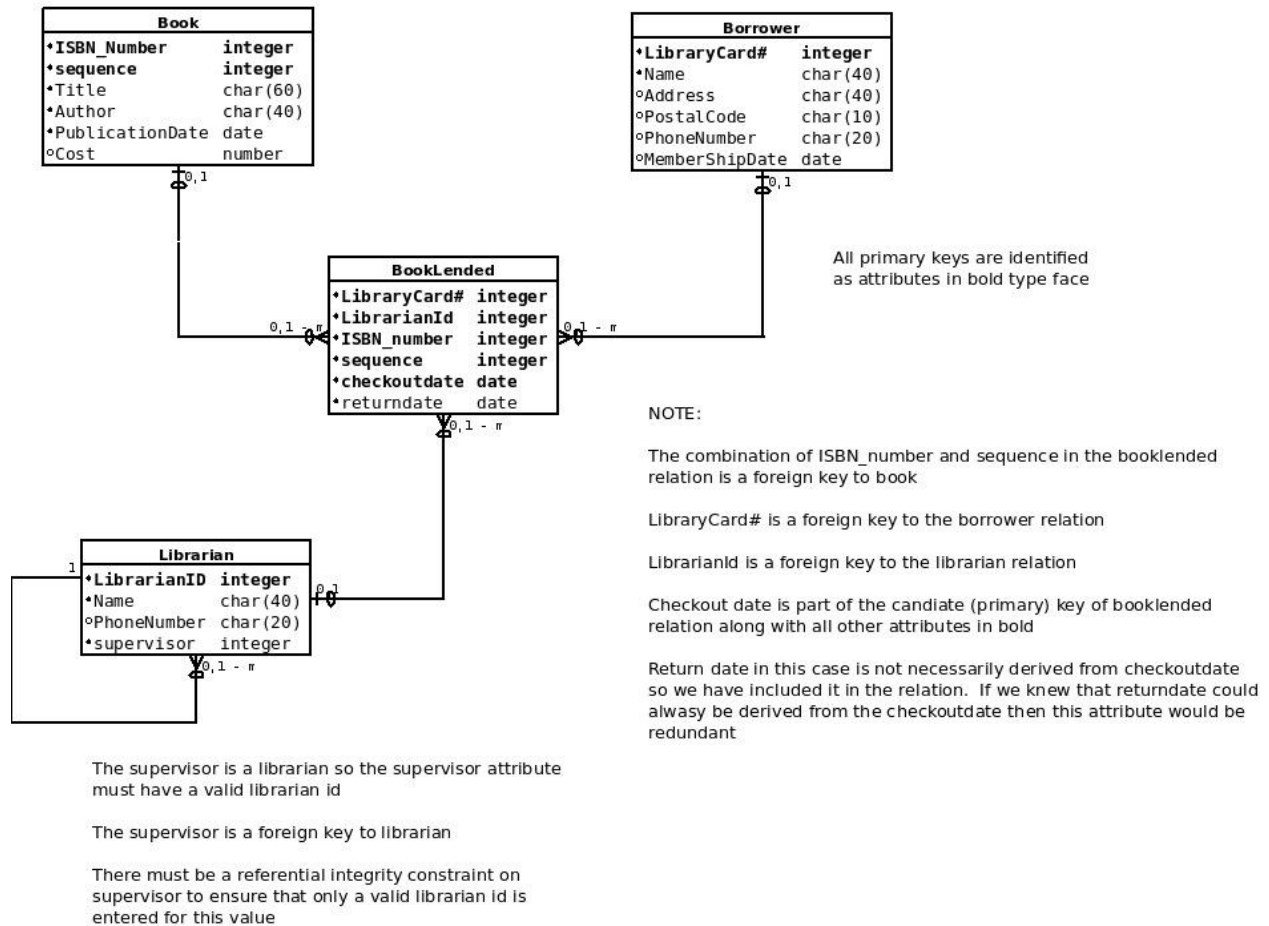


## Unit 3 Solution – ER Diagram

For assessments of your peers assignments DO NOT consider dashed versus solid lines in the diagram and do NOT mark down if the student does not have the proper symbols on the '1' side of the one to many relationship because it is a bit difficult to include these symbols as you need to create two lines one for the '1' side of the relationship and one for the 'many' side of the relationship



Note: It is NOT required to include updated relations, I have included this so that you can see how you should update your relations to reflect the updates in your data model.

### Book Relation

Attribute	Data	Constraint
Title	Char(60)	Not null constraint because a book must have a title
Author	Char(40)	Some works have no author so the not null constraint would not be appropriate
ISBN_number	integer	The ISBN number combined with the sequence

		<p>number uniquely identifies a book</p> <p>Not null constraint as this attribute is used as part of the primary key</p> <p>Unique constraint as it is a part of the primary key and as such must be unique.</p>
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	integer	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#	integer	<p>The library card # uniquely identifies a borrower as such it requires:</p> <p>Not null constraint as this attribute is used as part of the primary key</p> <p>Unique constraint as it is a part of the primary key and as such must be unique.</p>
Name	Char(40)	Name is a required field as it identifies the borrower as such it will require the not null constraint
Address	Char(40)	A borrower may or may not have an address so no constraint is required
Postal Code	Char(20)	Postal codes vary around the world so we will not impose a constraint for semantics on the field.
PhoneNumber	Char(20)	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	The member ship date has a specific format that

Date		should be validated using a semantic constraint (this is not required in your peers assignment)
------	--	---

## BookLended Relation

Attribute	Data	Constraint
Library Card#	Integer	<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>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)
ISBN_number	integer	<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>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>
Sequence	Integer	The sequence number will make the instance (or copy of a book) unique in case there is more than one copy of the exact same book. This is a part of the primary key
LibrarianId	integer	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.

## Librarian Relation

Attribute	Data	
Librarian Id	Integer	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	Char(40)	The name should have not null constraint because a librarian must have a name.
Phone Number	Char(20)	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)
Supervisor	integer	The supervisor is a librarian who supervises other librarians as such this field must have referential integrity with the librarianid as it is a foreign key to librarianid.