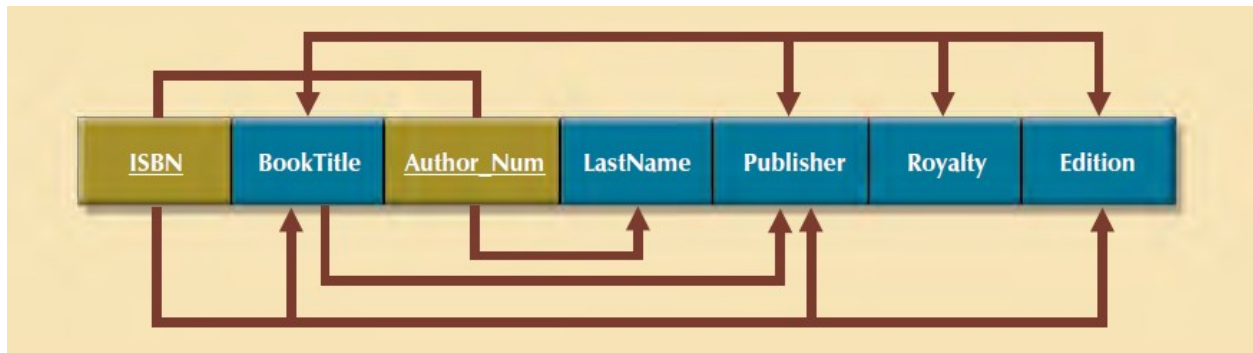# Quiz. 3

Royalty means the amount of money paid to each author for contributing in each book. You can consider it like book writing fee or charges.

The functional dependencies between different attributes are shown through arrow keys.
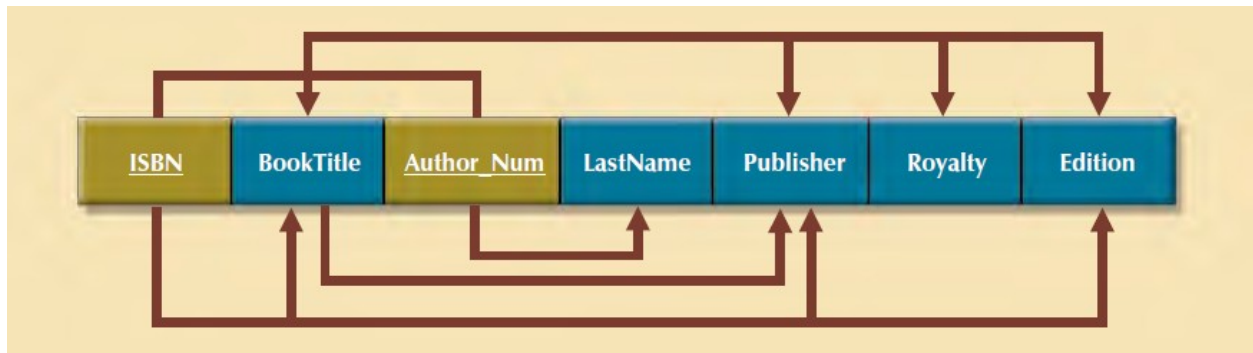
Use proper steps of normalization to normalize this relation.

1. Remove repeating groups
   → First Normal Form
2. Remove partial functional dependency
   → Second Normal Form
3. Remove transitive functional dependency
   → Third Normal Form

Important Instructions:

It is individual assignment and you have to submit it in hard form at the start of lab.

Assignment No.4 - Model Solution

First write all the attributes in one relation

Book						
ISBN	AuthorNum	BookTitle	LastName	Publisher	Royalty	Edition

Step1. Identify repeating groups

Since a book can be written by many authors, so there exists repeating group. So to remove repeating groups, create a composite primary key of the above relation. Since the relation contains two type of entities i.e. book and author, so make them primary key.

Book						
ISBN	**AuthorNum**	BookTitle	LastName	Publisher	Royalty	Edition

This relation contains no repeating groups now and the relation is in **First Normal Form**.

Step2. Identify full and partial functional dependency

Since dependencies are shown in the figure which are:

ISBN → BookTitle, Publisher, edition (partial functional dependency)

AuthorNum → LastName (partial functional dependency)

ISBN, AuthorNum → Royalty (full functional dependency)

To remove the partial dependency, we need to split the relation according to the determinants. The determinants becomes the primary key in respective relations.

Author	
AuthorNum	LastName

Book			
ISBN	BookTitle	Publisher	Edition

Book Royalty		
ISBN	**AuthorNum**	Royalty

The relations above are all in **second normal form**.

Step3. Identify transitive dependency

BookTitle → publisher

Make another relation with determinant as primary key as shown below.

Title Publisher	
BookTitle	Publisher

The primary key of this relation will also become foreign key in the previous relation Book.

Book		
ISBN	BookTitle	Edition

So the overall resultant relations are:

Author (AuthorNum, LastName)   TitlePublisher (BookTitle, publisher)

BookRoyalty (ISBN, AuthorNum, Royalty)   Book (ISBN, BookTitle, Edition)