Assignment Part 1:
Designing a Database for A* Design

ASSIGNMENT TITLE: Database Design for A* Fashion

s-Number	Full name	Course Code	Contribution %	Signature*
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Total contributions **100%**

Follow the note below.

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Declaration
Except where appropriately acknowledged, this assignment is our own work, has been expressed in our own words and has not previously been submitted for assessment. We have also retained a copy of this assessment piece for our own records.

Student 1:	Student 2:	Student 3:	Student 4:
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Date: _____ *	Date: _____ *	Date: _____ *	Date: _____ *

Follow the note below.

Note: All students in the group must sign & date (electronically or with pen) on this first page.

Table of Contents

[Generate a table of content with page numbers.]

List of Illustrations

[Generate a list of figures and tables with page numbers.]

Case Example (Note: You do NOT need to copy the case study here. This is only for understanding the case written in this sample)
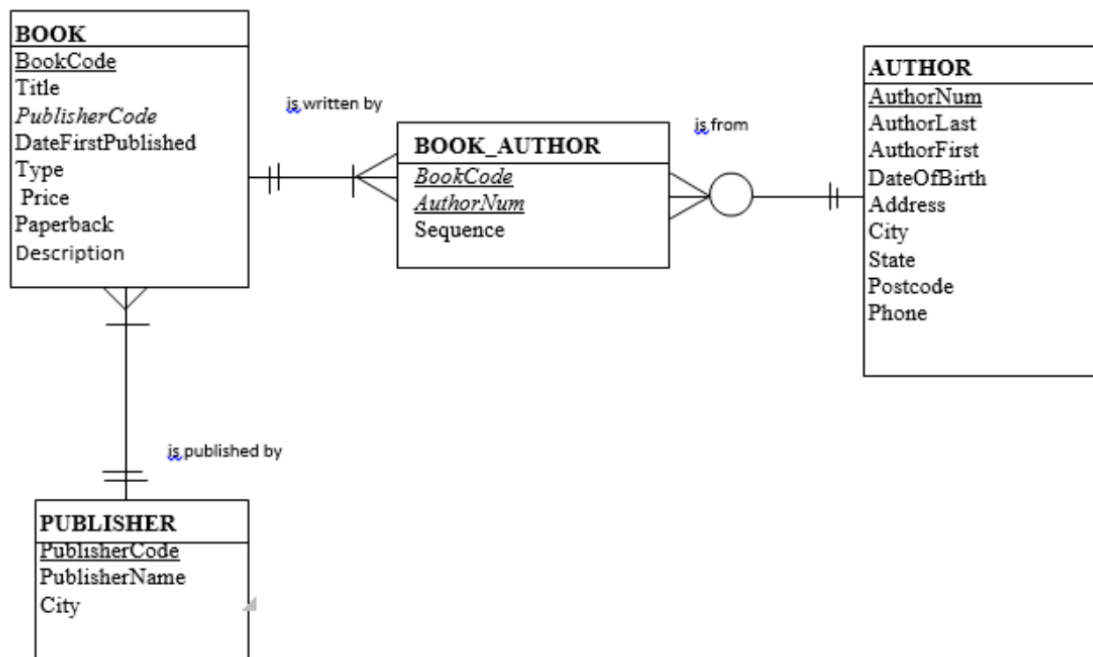
Library is a database that keeps track of information concerning the books and their information in an imaginary departmental library. The data that populates the database are artificially constructed and by no means correspond to actual real world data.

Library DB consists of the following tables:

- o Author, which keeps track of personal information about authors (first, last names, etc).
- o Publisher, which keeps track of publishers (their name, etc).
- o Book, which contains information about the books that are available in the library (title, etc.).
- o Every book must have at least one or more authors and it is related to one or more publishers.

Entity Relationship Diagram
[Place your ERD only below. No need to copy the business case.]

BOOK
BookCode
Title
PublisherCode
DateFirstPublished
Type
 Price
Paperback
Description

is written by

BOOK_AUTHOR
BookCode
AuthorNum
Sequence

is from

AUTHOR
AuthorNum
AuthorLast
AuthorFirst
DateOfBirth
Address
City
State
Postcode
Phone

is published by

PUBLISHER
PublisherCode
PublisherName
City

Assumptions

- A book must be published by a publisher
- A publisher must publish at least one book, but may publish many books.
- An author may publish one or more books
- A book must be written by one or more authors.

Anomolies [For group with master students]

In BOOK, PUBLISHER, and BOOK_AUTHOR entities there are no insertion, deletion, or update anomalies as in each entity its primary key will uniquely identify each row of data and a non-key attribute will not be dependent on any part of the primary key or other non-key attribute.

However, AUTHOR entity may have anomalies because Postcode depends on both City and State:

ANum	FirstN	LastN	DoB	Adress	City	State	Postcode	Phone
1	M	John	1-2-1980	1 Park St	Kuraby	QLD	4112	04xx
2	J	Wang	5-3-1981	2 Pond Rd	Kuraby	QLD	4112	04xx
3	R	Deb	8-1-1982	3 Rain Av	Woodridge	QLD	4114	04xx

- Update anomaly: If we need to update Postcode for Kuraby, we need to update in more than 1 record.
- Insertion anomaly: If we insert a new author for whom we do not know Postcode for his/her City (Sunnybank) and State (QLD), because the table currently does not this, we can enter null.
- Deletion anomaly: If we delete the author from Woodridge QLD, we lose the information about PostCode of Woodridge QLD.

Normalisation

[Convert each entity from your ERD into a relation schema, draw dependency diagram and/or step-by-step convert it to 3NF. Mention the reason why a relation schema cannot be converted to the 3NF.]

1. Relation schema

1. BOOK (BookCode, Title, PublisherCode, DateFirstPublished, Type, Price, Paperback, Description)
2. AUTHOR (AuthorNum, AuthorLast, AuthorFirst, DateOfBirth, Address, City, State, Postcode, Phone)
3. BOOK_AUTHOR (*BookCode, AuthorNum*, sequence)
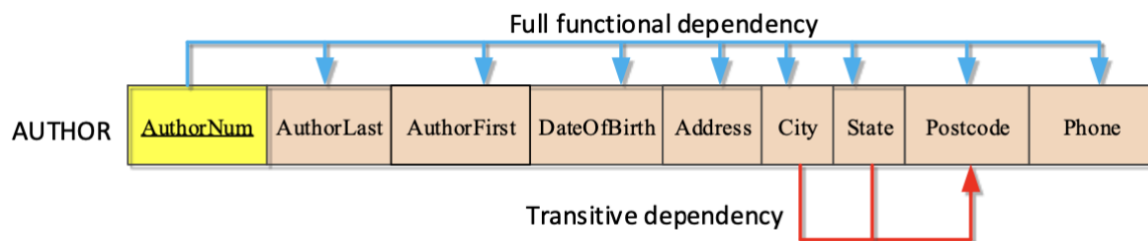4. PUBLISHER (PublisherCode, PublisherName, City)

2. Normalisation

1. For **BOOK** table the dependency diagram is:
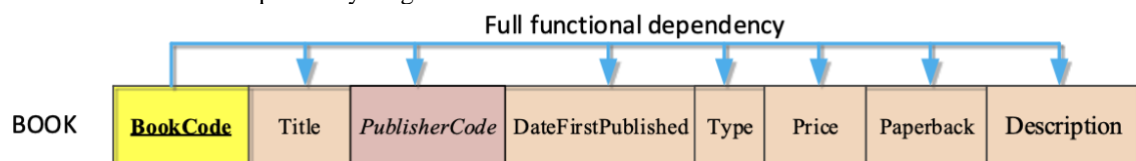
The table is in 3NF because it has only the full dependency (and no partial & transitive dependencies):

BookCode ➔ Title, PublisherCode, DateFirstPublished, Type, Price, Paperback, Description

2. For **AUTHOR** table the dependency diagram is:

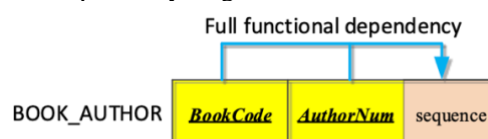This table is in a 2NF because it has a transitive dependency (and but no partial dependency):

- **Full dependency**: AuthorNum ➔ AuthorLast, AuthorFirst, DateOfBirth, Address, City, State, Postcode, Phone
- **Transitive dependency**: {City, State} ➔ Postcode

There is a transitive functional dependency among AuthorID, City, State and PostCode. The PostCode is related to the City/State combination, i.e., a transitive dependency, therefore, not in 3NF.

- AuthorID ➔ City, State
- {City, State} ➔ PostCode

However, postcode doesn't introduce big redundancy (only one attribute), so there is no need to decompose this table into two.
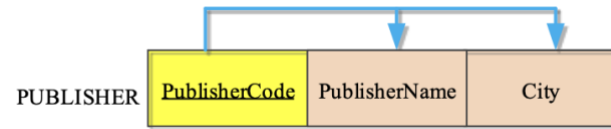
3. For **BOOK_AUTHOR** table the dependency diagram is:

The table is in 3NF because it has only the full dependency (and no partial & transitive dependencies)

- {BookCode, AuthorNum} ➔ Sequence

4. For **PUBLISHER** table the dependency diagram is:

PUBLISHER | PublisherCode | PublisherName | City

The table is in 3NF because it has only the full dependency (and no partial & transitive dependencies)
- PublisherCode ➜ PublisherName, City

Relational database schema

[Convert your ERD into a relational database schema showing appropriate tables, columns, primary keys, and foreign keys, foreign key references, field type & format, etc.]

Table Name	Field	Type	Description
BOOK	BookCode	CHAR(6)	PRIMARY KEY
	Title	VARCHAR(40)	
	PublisherCode	CHAR(3)	FOREIGN KEY REFERENCES PUBLISHER(PublisherCode)
	DateFirstPublished	DATE	**Format:** DD-MM-YYYY
	Type	CHAR(3)	
	Price	DOUBLE	
	Paperback	CHAR(1)	
	Description	VARCHAR(30)	
AUTHOR	AuthorNum	INT (11)	PRIMARY KEY NOT NULL AUTO_INCREMENT
	AuthorLast	VARCHAR(12)	
	AuthorFirst	VARCHAR(10)	
	DateOfBirth	DATE	
	Address	VARCHAR(30)	
	City	VARCHAR(30)	
	State	CHAR(3)	
	Postcode	CHAR(4)	
	Phone	VARCHAR(15)	
BOOK-AUTHOR	BookCode	CHAR(6)	PRIMARY KEY FOREIGN KEY REFERENCES BOOK(BookCode)
	AuthorNum	INT(11)	PRIMARY KEY FOREIGN KEY REFERENCES AUTHOR(AuthorNum)
	Sequence	INT	
PUBLISHER	PublisherCode	CHAR(3)	PRIMARY KEY
	PublisherName	VARCHAR(25)	
	City	VARCHAR(30)	

Table 1. Relational Database Schema

Appendices (optional)
[Add any additional work other than what has been requested.]

Bibliography

[Add any references (e.g., books, online documents, etc.) that you have used.]