2814ICT – DATA MANAGEMENT
7003ICT – DATABASE DESIGN
School of Information & Communication Technology
Trimester 1, 2019

# Assignment Part 1:
## Designing a Database for WareMart

**ASSIGNMENT TITLE:** Logical Database model for WareMart Logistics _____

| | | |
|---|---|---|
| **Student 1** | **s-number:** 2976800 | **Full name:** Mohammad Awrangjeb |
| **Student 2** | **s-number:** 5877090 | **Full name:** Md Polash |
| **Student 3** | **s-number:** 7928309 | **Full name:** Rupam Deb |
| **Course Code:** 2814ICT | | **Workshop/Lab day & time:** Fri 10:00-11:50 am |
| **Tutor's name:** Nosheen Munir | | **Date submitted:** 15-03-2019 |

**Marks obtained:** _____. [For marker to fill up.]

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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:** |
|---|---|---|
| Name: __Mohammad____ | Name: ___Md Polash____ | Name: ___Rupam Deb__ |
| Signature: ____(must sign)*__ | Signature: ____(must sign) *_ | Signature: ____(must sign) *_ |
| Date: ___10-03-2019___ | Date: ___10-03-2019___ | Date: ___10-03-2019___ |

****Follow the note below.***

**Note: All students in the group must sign this first page, scan the signed page, and then place at the beginning of the assignment.**

## Table of Contents



## List of Illustrations



## Statement of Completion:

All tasks have been completed.

## Acknowledgements:

Mohammad Awrangjeb
Sen Wang
Rupam Deb
Md Polash

## Case Example

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 (this is a disclaimer :).

Library DB consists of the following tables:

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

## Synopsis

The purpose of this assignment is to create the design for……..

## Entity Relationship Diagram

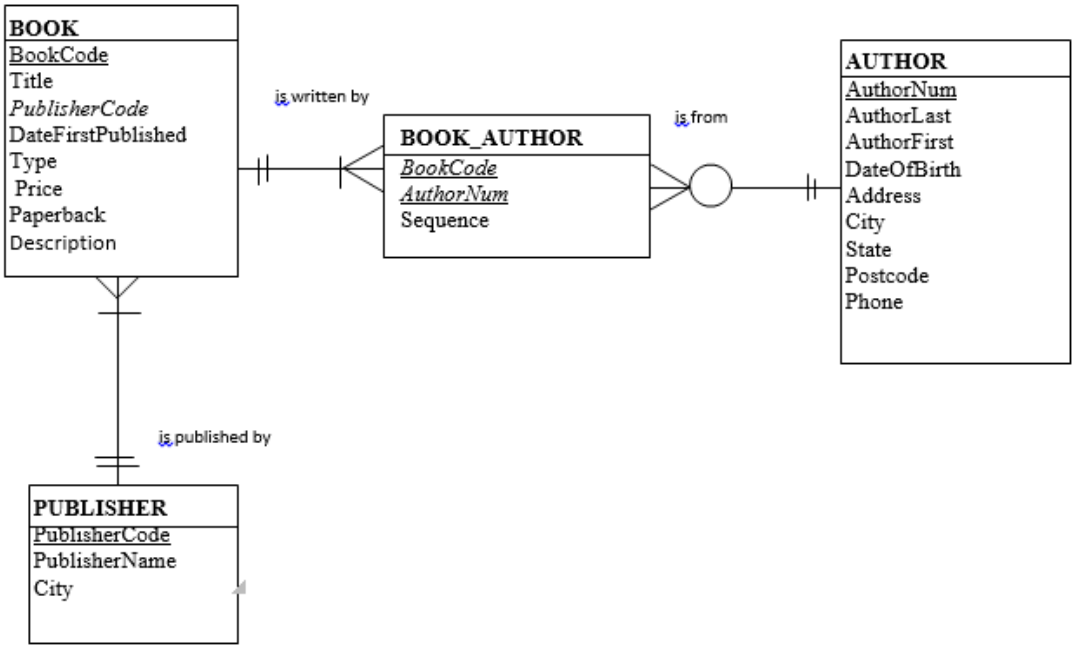


Figure1: Entity Relationship Diagram

## 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.

# Normalisation

## a) 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)

## b) Normalisation

1. **BOOK** (BookCode, Title, PublisherCode, DateFirstPublished, Type, Price, Paperback, Description)

   This relational data structure is in a 3rd NF:
   - BookCode -> Title, PublisherCode, DateFirstPublished, Type, Price, Paperback, Description

- **Note: Dependency diagrams for each relation may also be presented in this section! See the assignment specification and/or marking guide.**

2. **AUTHOR** (AuthorNum, AuthorLast, AuthorFirst, DateOfBirth, Address, City, State, Postcode, Phone)

   This relational data structure is in a 2ND NF:
   - AuthorNum -> AuthorLast, AuthorFirst, DateOfBirth, Address, City, State, Phone
   - 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 partial dependency; therefore not in 3NF.
   - However, postcode doesn't introduce big redundancy (only one attribute), so there is no need to decompose this table into two.

3. **BOOK_AUTHOR** (*BookCode, AuthorNum*, sequence)

   This relational data structure is in a 3rd NF
   - BookCode & AuthorNum -> Sequence

4. **PUBLISHER** (PublisherCode, PublisherName, City)

   This relational data structure is in a 3rd NF:
   - PublisherCode -> PublisherName, City

## Relational Database Schema

| Table Name | Field | Type | Description |
|---|---|---|---|
| BOOK | BookCode | VARCHAR(6) | PRIMARY KEY |
| | Title | VARCHAR(40) | |
| | PublisherCode | VARCHAR(3) | FOREIGN KEY REFERENCES PUBLISHER(PublisherCode) |
| | DateFirstPublished | DATE | **Format:** DD-MM-YYYY |
| | Type | VARCHAR(3) | |
| | Price | DOUBLE | |
| | Paperback | CHAR(1) | |
| | Description | VARCHAR(30) | |
| AUTHOR | AuthorNum | INT (11) | PRIMARY KEY<br>NOT NULL<br>AUTO_INCREMENT |
| | AuthorLast | VARCHAR(12) | |
| | AuthorFirst | VARCHAR(10) | |
| | DateOfBirth | DATE | |
| | Address | VARCHAR(30) | |
| | City | VARCHAR(30) | |
| | State | VARCHAR(4) | |
| | Postcode | VARCHAR(5) | |
| | Phone | VARCHAR(15) | |
| BOOK-AUTHOR | BookCode | VARCHAR(6) | PRIMARY KEY<br>FOREIGN KEY REFERENCES BOOK(BookCode) |
| | AuthorNum | INT(11) | PRIMARY KEY<br>FOREIGN KEY REFERENCES AUTHOR(AuthorNum) |
| | Sequence | INT | |
| PUBLISHER | PublisherCode | VARCHAR(3) | PRIMARY KEY |
| | PublisherName | VARCHAR(25) | |
| | City | VARCHAR(30) | |

**Table 1. Relational Database Schema**

## Appendices [Optional]

Any additional work other than what has been requested.

## **Bibliography** [Optional]

[1] Coronel, C., Morris, S. and Rob, P. (2017). *Database Systems: Design Implementation, and Management.* Cengage Learning.

[2] Connolly, Thomas and Begg, Carolyn. (2017). *A Practical Approach to Design, Implementation and Management.* Addison Wesley.