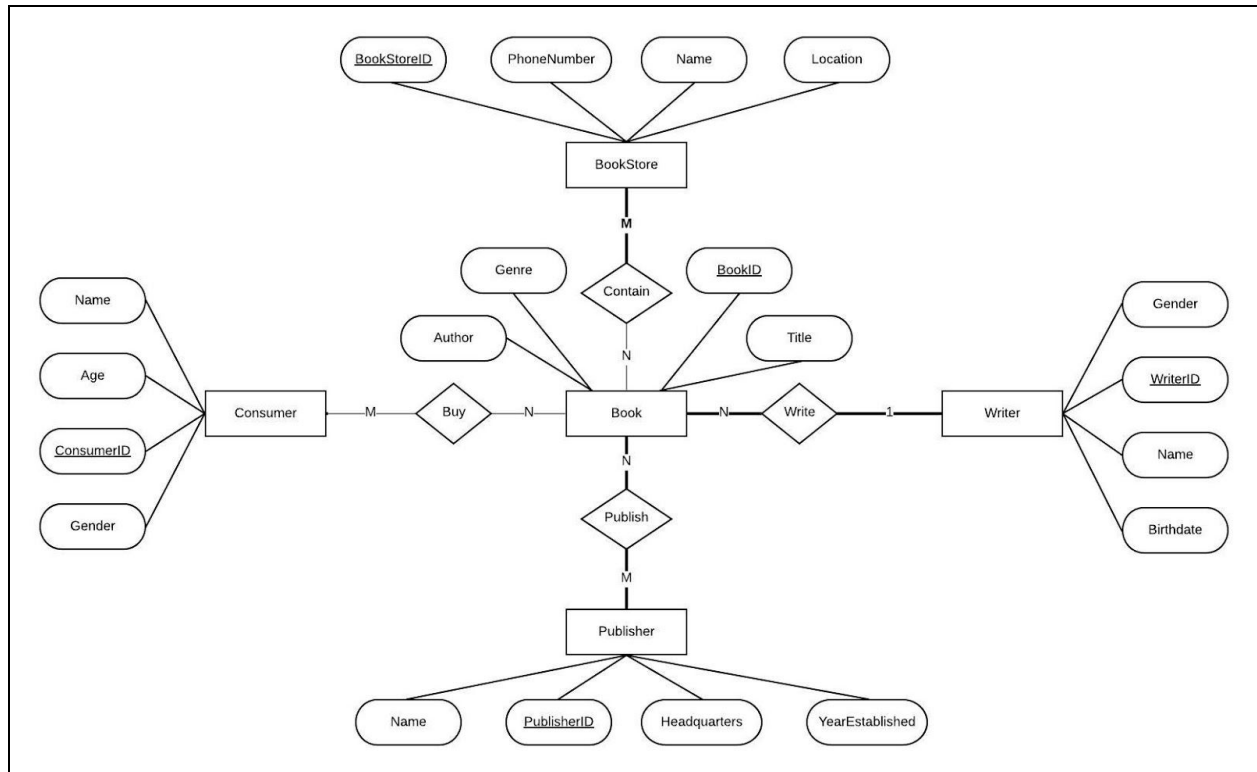# IB CS: Database Building

Hina Sekine and Tung Hoang

Example 2: Consumers buy novels all the time in bookstores. Novels are written by one writer. Each novel can be published by multiple publishers (due to different languages and different publication dates). A bookstore contains a variety of books.

Entity Relationship Diagram (Hina)

BookStoreID PhoneNumber Name Location

BookStore

M

Contain

Genre BookID

Author Title

N

Name

Age

ConsumerID

Gender

Consumer — M — Buy — N — Book — N — Write — 1 — Writer

Gender

WriterID

Name

Birthdate

N

Publish

M

Publisher

Name PublisherID Headquarters YearEstablished

Relational Map (Tung)

Book

BookID	Title	Genre	WriterID*

Writer

WriterID	Name	Gender	Birthdate

Consumer

ConsumerID	Name	Gender	Age

Publisher

PublisherID	Name	Headquarters	YearEstablished

BookStore

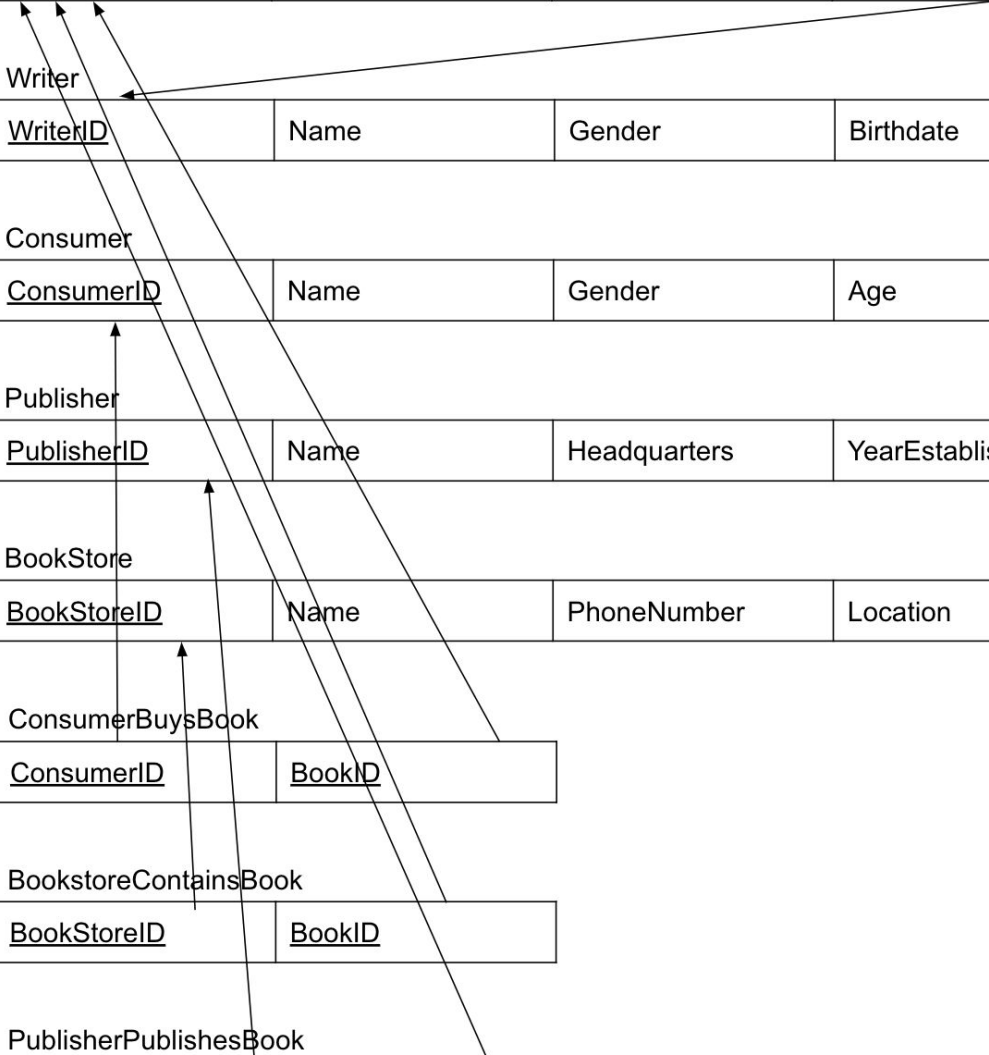| BookStoreID	Name	PhoneNumber	Location

ConsumerBuysBook

ConsumerID	BookID

BookstoreContainsBook

BookStoreID	BookID

PublisherPublishesBook

PublisherID	BookID

Data Dictionary (Hina)

Book

BookID	INT	NOT NULL
Title	VARCHAR(100)	NOT NULL
Genre	VARCHAR(50)	NOT NULL
WriterID*	INT	NOT NULL

Publisher

PublisherID	INT	NOT NULL
Name	VARCHAR(100)	NOT NULL
Headquarters	VARCHAR(100)	NOT NULL
YearEstablished	DATE	NOT NULL

Writer

WriterID	INT	NOT NULL
Name	VARCHAR(100)	NOT NULL
Gender	VARCHAR(10)	NOT NULL
Birthdate	DATE	NOT NULL

Consumer

ConsumerID	INT	NOT NULL
Name	VARCHAR(100)	NOT NULL
Gender	VARCHAR(10)	NOT NULL
Birthdate	DATE	NOT NULL

BookStore

BookStoreID	INT	NOT NULL
Name	VARCHAR(100)	NOT NULL

PhoneNumber	INT	NOT NULL
Location	VARCHAR(100)	NOT NULL

ConsumerBuysBook

ConsumerID	INT	NOT NULL
BookID	INT	NOT NULL

BookStoreContainsBook

BookStoreID	INT	NOT NULL
BookID	INT	NOT NULL

PublisherPublishesBooks

PublisherID	INT	NOT NULL
BookID	INT	NOT NULL

Data Definition Language (Tung)

```
DROP TABLE IF EXISTS Book;
DROP TABLE IF EXISTS Publisher;
DROP TABLE IF EXISTS Writer;
DROP TABLE IF EXISTS Consumer;
DROP TABLE IF EXISTS BookStore;
DROP TABLE IF EXISTS ConsumerBuysBook;
DROP TABLE IF EXISTS BookStoreContainsBook;
DROP TABLE IF EXISTS PublisherPublishesBook;

CREATE TABLE Writer
(
        WriterID INTEGER NOT NULL,
        Name VARCHAR(100) NOT NULL,
        Gender VARCHAR(10) NOT NULL,
        Birthdate DATE NOT NULL,
        PRIMARY KEY (WriterID)
);

CREATE TABLE Book
(
        BookID INTEGER NOT NULL,
        Title VARCHAR(100) NOT NULL,
        Genre VARCHAR(50) NOT NULL,
        WriterID INTEGER NOT NULL,
        PRIMARY KEY (BookID),
        FOREIGN KEY (WriterID) REFERENCES Writer(WriterID)
);

CREATE TABLE Publisher
(
        PublisherID INTEGER NOT NULL,
        Name VARCHAR(100) NOT NULL,
        Headquarters VARCHAR(50) NOT NULL,
        YearEstablished DATE NOT NULL,
        PRIMARY KEY (PublisherID)
);

CREATE TABLE Consumer
(
        ConsumerID INTEGER NOT NULL,
```

```sql
        Name VARCHAR(100) NOT NULL,
        Gender VARCHAR(10) NOT NULL,
        Birthdate DATE NOT NULL,
        PRIMARY KEY (ConsumerID)
);

CREATE TABLE BookStore
(
        BookStoreID INTEGER NOT NULL,
        Name VARCHAR(100) NOT NULL,
        PhoneNumber INTEGER NOT NULL,
        Location VARCHAR(100) NOT NULL,
        PRIMARY KEY (BookStoreID)
);

CREATE TABLE ConsumerBuysBook
(
        ConsumerID INTEGER NOT NULL,
        BookID INTEGER NOT NULL,
        PRIMARY KEY (ConsumerID, BookID),
        FOREIGN KEY (ConsumerID) REFERENCES Consumer(ConsumerID),
        FOREIGN KEY (BookID) REFERENCES Book(BookID)
);

CREATE TABLE BookStoreContainsBook
(
        BookStoreID INTEGER NOT NULL,
        BookID INTEGER NOT NULL,
        PRIMARY KEY (BookStoreID, BookID),
        FOREIGN KEY (BookStoreID) REFERENCES BookStore(BookStoreID),
        FOREIGN KEY (BookID) REFERENCES Book(BookID)
);

CREATE TABLE PublisherPublishesBook
(
        PublisherID INTEGER NOT NULL,
        BookID INTEGER NOT NULL,
        PRIMARY KEY (PublisherID, BookID),
        FOREIGN KEY (PublisherID) REFERENCES Publisher(PublisherID),
        FOREIGN KEY (BookID) REFERENCES Book(BookID)
);
```

POPULATING TABLES (Hina)

INSERT INTO Writer (WriterID, Name, Gender, Birthdate) VALUES (1, 'Harper Lee', 'Female', '4/28/1926');
INSERT INTO Writer (WriterID, Name, Gender, Birthdate) VALUES (2, 'Jane Austen', 'Female', '12/16/1775');

INSERT INTO Book (BookID, Title, Genre, WriterID) VALUES (1, 'To Kill a Mockingbird', 'Historical Fiction', 1);
INSERT INTO Book (BookID, Title, Genre, WriterID) VALUES (2, 'Pride and Prejudice', 'Romance', 2);
INSERT INTO Book (BookID, Title, Genre, WriterID) VALUES (3, 'Emma', 'Romance', 2);
INSERT INTO Book (BookID, Title, Genre, WriterID) VALUES (4, 'Sense and Sensibility', 'Romance', 2);
INSERT INTO Book (BookID, Title, Genre, WriterID) VALUES (5, 'Go Set a Watchman', 'Historical Fiction', 1);

INSERT INTO Publisher (PublisherID, Name, Headquarters, YearEstablished) VALUES (1, 'Penguin Books', 'London, United Kingdom', 1935);
INSERT INTO Publisher (PublisherID, Name, Headquarters, YearEstablished) VALUES (2, 'HarperCollins', 'Newyork, Newyork, United States', 1989);

INSERT INTO Consumer (ConsumerID, Name, Gender, Birthdate) VALUES (1, 'Hina Sekine', 'Female', '2/5/2003');
INSERT INTO Consumer (ConsumerID, Name, Gender, Birthdate) VALUES (2, 'Tung Hoang', 'Male', '11/9/2003');
INSERT INTO Consumer (ConsumerID, Name, Gender, Birthdate) VALUES (3, 'Miki Ando', 'Female', '5/17/2002');
INSERT INTO Consumer (ConsumerID, Name, Gender, Birthdate) VALUES (4, 'Albert Wang', 'Male', '9/9/2003');

INSERT INTO BookStore (BookStoreID, Name, PhoneNumber, Location) VALUES (1, 'Lovely Books', 0908777777, '56 Nguyen Duc Canh, Saigon, Vietnam');
INSERT INTO BookStore (BookStoreID, Name, PhoneNumber, Location) VALUES (2, 'Yay Life Books', 09056463647, '48 1st Street, New York');

INSERT INTO ConsumerBuysBook (ConsumerID, BookID) VALUES (1, 2);
INSERT INTO ConsumerBuysBook (ConsumerID, BookID) VALUES (1, 5);
INSERT INTO ConsumerBuysBook (ConsumerID, BookID) VALUES (2, 1);
INSERT INTO ConsumerBuysBook (ConsumerID, BookID) VALUES (3, 1);
INSERT INTO ConsumerBuysBook (ConsumerID, BookID) VALUES (4, 4);

```sql
INSERT INTO BookStoreContainsBook (BookStoreID, BookID) VALUES (1, 2);
INSERT INTO BookStoreContainsBook (BookStoreID, BookID) VALUES (1, 3);
INSERT INTO BookStoreContainsBook (BookStoreID, BookID) VALUES (2, 3);
INSERT INTO BookStoreContainsBook (BookStoreID, BookID) VALUES (2, 4);

INSERT INTO PublisherPublishesBook (PublisherID, BookID) VALUES (1, 1);
INSERT INTO PublisherPublishesBook (PublisherID, BookID) VALUES (1, 5);
INSERT INTO PublisherPublishesBook (PublisherID, BookID) VALUES (2, 2);
INSERT INTO PublisherPublishesBook (PublisherID, BookID) VALUES (2, 3);
INSERT INTO PublisherPublishesBook (PublisherID, BookID) VALUES (2, 4);
```