

## Task 1: Translation

1.Customer(customer\_id, name, email, street, city, postcode, country)

Entity sets: customer

Primary keys: customer\_id

Multivalued attributes: email

Composite attribute: address

General attribute: name

Customer\_phone(customer\_id, phone\_number, phone\_type)

Entity sets: Customer\_phone

Primary keys:customer\_id

Foreign keys:customer\_id

Multivalued attributes: phone\_number

Composite attribute: phone\_number

General attribute: phone\_type

Order(order\_id, delivery\_street, delivery\_city, delivery\_postcode, delivery\_country, date\_ordered, date\_delivered)

Entity sets:Order

Primary keys:order\_id

Composite attribute:delivery\_address

General attribute:date\_ordered, date\_delivered

Order\_Place(order\_id, customer\_id)

Entity sets:Order\_Place

Primary keys:order\_id, customer\_id

Foreign keys:order\_id, customer\_id

Book(book\_id, title, author, genre, publisher)

Entity sets:Book

Primary keys:book\_id

Multivalued attributes:genre, publisher

General attribute:title, author

Edition(book\_id, edition, type, price, quantity\_in\_stock)

Entity sets:Edition

Primary keys:book\_id, edition

Foreign keys:book\_id

Multivalued attributes:type

General attribute:price, quantity\_in\_stock

Review(book\_id, customer\_id, rating)

Entity sets:Review

Primary keys:book\_id, customer\_id

Foreign keys:book\_id, customer\_id

General attribute:rating

Genre(book\_id, genre)

Entity sets:Genre

Primary keys:book\_id

Foreign keys:book\_id

Multivalued attributes:genre

Contain(book\_id, order\_id, edition)

Entity sets:Contain

Primary keys: book\_id, order\_id

Foreign keys:book\_id, order\_id

Multivalued attributes:edition

Supplier(supplier\_id, name, account\_no, email, phone\_number, phone\_type)

Entity sets:Supplier

Primary keys:supplier\_id

Multivalued attributes: email, phone\_number

General attribute:name, account\_nor, phone\_type

Supplies(supplier\_id, book\_id, supply\_price)

Entity sets:Supplies

Primary keys:supplier\_id, book\_id

Foreign keys:supplier\_id, book\_id

General attribute: supply\_price

Supplier\_phone(supplier\_id, phone\_number, phone\_type)

Entity sets:Supplier\_phone

Primary keys:supplier\_id

Foreign keys:supplier\_id

Multivalued attributes:phone\_number

General attribute:phone\_type

## Task 2: SQL Data Definition

This is the table and values of Order.

```
use yh45_assn2;

CREATE TABLE Order_([
order_id CHAR(10)PRIMARY KEY,
delivery_street VARCHAR(20)NOT NULL,
delivery_city VARCHAR(20)NOT NULL,
delivery_postcode VARCHAR(10)NOT NULL,
delivery_country VARCHAR(10)NOT NULL,
date_ordered date,
date_delivered date]);
INSERT INTO Order_ VALUES
('1837002857', '77 Roman Rd', 'LEEDS', 'LS1 2DX', 'UK', 20180203, 20180213),
('1837873829', '33 Park Row', 'EDINBURGH', 'EH3 3NS', 'UK', 20130405, 20130415),
('1839402720', '30 Mith Street', 'GLASGOW', 'G1 9FG', 'UK', 20120405, 20120415),
('1822398093', '93 Church Way', 'BRADFORD', 'EX22 8BL', 'UK', 20120203, 20120213),
('1820393587', '60 Park Row', 'EDINBURGH', 'EH3 9HL', 'UK', 20140301, 20140311),
('1898099282', '18 Ploughley Rd', 'TOOHILLS', 'D04 5SS', 'UK', 20150201, 20150212),
('1802898345', '33 Guild Street', 'LONDON', 'EC1A 8YX', 'UK', 20120403, 20140413),
('1820980738', '95 Park Row', 'DUNDEE', 'DD1 2ZT', 'UK', 20130105, 20130114),
('1738466826', '6 Ifley Road', 'BRISTOL', 'BS6 4EG', 'UK', 20150105, 20150111),
('1811279090', '1 Hudson St', 'DUNDEE', 'DD1 4YZ', 'UK', 20160203, 20160204);
```

DBeaver 5.2.0 - Order\_

Properties Data ER Diagram

Order\_ | Enter a SQL expression to filter results (use Ctrl+Space)

	order_id	delivery_street	delivery_city	delivery_postcode	delivery_country	date_ordered	date_delivered
1	1738466826	6 Ifley Road	BRISTOL	BS6 4EG	UK	2015-01-05	2015-01-11
2	1802898345	33 Guild Street	LONDON	EC1A 8YX	UK	2012-04-03	2014-04-13
3	1811279098	1 Hudson St	DUNDEE	DD1 4YZ	UK	2016-02-03	2016-02-04
4	1820393587	60 Park Row	EDINBURGH	EH3 9HL	UK	2014-03-01	2014-03-11
5	1820980738	95 Park Row	DUNDEE	DD1 2ZT	UK	2013-01-05	2013-01-14
6	1822398093	93 Church Way	BRADFORD	EX22 8BL	UK	2012-02-03	2012-02-13
7	1837002857	77 Roman Rd	LEEDS	LS1 2DX	UK	2018-02-03	2018-02-13
8	1837873829	33 Park Row	EDINBURGH	EH3 3NS	UK	2013-04-05	2013-04-15
9	1839402720	30 Nith Street	GLASGOW	G1 9FG	UK	2012-04-05	2012-04-15
10	1898099282	18 Ploughley Rd	TODHILLS	DD4 5SS	UK	2015-02-01	2015-02-12

Save Cancel Script < > Record Panels Grid Text

① 10 row(s) fetched - 1ms (+1ms)

2

This is the table and values of Customer.

DBeaver 5.2.0 - <yh45>.assn2.sql

CREATE TABLE Customer (customer\_id CHAR(10) PRIMARY KEY, name VARCHAR(50) NOT NULL, email VARCHAR(50) NOT NULL, street VARCHAR(50) NOT NULL, city VARCHAR(20) NOT NULL, postcode VARCHAR(10) NOT NULL, country VARCHAR(10) NOT NULL);

INSERT INTO Customer VALUES ('18293710', 'Logan Woodward', 'lw46@mail.net', '58 Kendell Street', 'SHELDON', 'EX14 0BW', 'UK'), ('21243453', 'Tyler Oliver', '1542600@gmail.net', '44 Park End St', 'BROCKTON', 'TE13 9HA', 'UK'), ('38087605', 'Elizabeth O'Hearn', 'elizabethohearn15@yahoo.com', '1 Hudson St', 'DUNDEE', 'DD1 4YZ', 'UK'), ('48495567', 'Alisha H Arnold', 'enh7@mail.net', '86 Hudson St', 'DUNDEE', 'DD1 8XH', 'UK'), ('152035542', 'Ellis A Poppe', 'st897@mail.net', '31 Crown Street', 'LONDON', 'SW1A 3SG', 'UK'), ('62836788', 'Oliver S Townsend', 'l345@mail.net', '35 Guild Street', 'LONDON', 'SE22 1YL', 'UK'), ('78394432', 'Alisha H Arnold', 'jhp6@mail.net', '47 Roman Rd', 'LEEDS', 'LS1 9BR', 'UK'), ('88493028', 'Joel A Davey', 'myfr34@mail.net', '44 Nith Street', 'GLASGOW', 'G1 3GB', 'UK'), ('90383020', 'Isobel F Thomson', 'uhd4@mail.net', '57 West Lane', 'DALHALVAIG', 'KW13 5GS', 'UK'), ('10783923', 'Tia L Matthews', 'sqdsdn@claimab.com', '19 Park Row', 'EDINBURGH', 'EH6 2YL', 'UK');

Statistics

① INSERT INTO Genre\_ | Enter a SQL expression to filter results (use Ctrl+Space)

Name	Value
Updated Rows	15

Query

```
INSERT INTO Genre_ VALUES
(59541,'classic'),
(58448,'fiction'),
(55564,'classic'),
(53376,'fiction'),
(47303,'fiction'),
(45447,'adventure'),
(43592,'romance'),
(42327,'fiction'),
(42802,'politics'),
```

Save Cancel Script < > Record Panels

① 1 row(s) fetched - 3ms

3

DBeaver 5.2.0 - Customer\_

Customer\_ | Enter a SQL expression to filter results (use Ctrl+Space)

	customer_id	name	email	street	city	postcode	country
1	10783923	Tia L Matthews	sqdson@claimab.com	19 Park Row	EDINBURGH	EH6 2YL	UK
2	18293710	Logan Woodward	lw46@mail.net	58 Kendell Street	SHELDON	EX14 0BW	UK
3	21243453	Tyler Oliver	542600@igenie.net	44 Park End St	BROCKTON	TF13 9HA	UK
4	38768765	Elizabeth O Hunt	6p0c6k6hp@ffymedia.com	1 Hudson St	DUNDEE	DD1 4YZ	UK
5	48490982	Ellie N Hughes	enh7@mail.net	86 Hudson St	LONDON	SW1A 3SG	UK
6	53925542	Ellis A Pope	st897@mail.net	21 Crown Street	LONDON	SE22 1YL	UK
7	62836788	Oliver S Townsend	l345@mail.net	35 Guild Street	LONDON	LS1 9BR	UK
8	78394432	Alisha H Arnold	jhg6@mail.net	47 Roman Rd	LEEDS	LS1 9BR	UK
9	88493028	Joel A Davey	myfr34@mail.net	44 Nith Street	GLASGOW	G1 3GB	UK
10	90383020	Isobel F Thomson	uhd4@mail.net	57 West Lane	DALHALVAIG	KW13 5GS	UK

4

This is the table and values of Book.

DBeaver 5.2.0 - <yh45>\_assn2.sql

```

CREATE TABLE Book_(
book_id CHAR(5)PRIMARY KEY,
title VARCHAR(30)NOT NULL,
author VARCHAR(30)NOT NULL,
publisher VARCHAR(30)NOT NULL
);

INSERT INTO Book_ VALUES
('59541', 'Pride and Prejudice', 'Jane Austen', 'Solis Press'),
('58448', 'The Da Vinci Code', 'Dan Brown', 'Solis Press'),
('55564', 'The Catcher in the Rye', 'J. D. Salinger ', 'Urban Romantics'),
('53376', 'The Great Gatsby', 'F. Scott Fitzgerald', 'Solis Press'),
('47303', 'Twilight', 'Stephenie Meyer', 'Urban Romantics'),
('45447', 'The Hunger Games', 'Suzanne Collins ', 'Tom media'),
('43592', 'Jane Eyre', 'Charlotte Brontë ', 'Tantor Media'),
('43237', 'The Kite Runner', 'Khaled Hosseini', 'Tom media'),
('42802', 'Animal Farm', 'George Orwell', 'Recorded Books'),
('40352', 'Brave New World', 'Aldous Huxley', 'Recorded Books'),
('39599', 'The Lord of the Rings', 'J. R. R. Tolkien', 'HighBridge Audio'),
('37609', 'Angels & Demons', 'Dan Brown', 'HighBridge Audio'),
('49382', 'This is life', 'Elliot K Kirby', 'RealLifeBooks'),
('12934', '30 Minute Meals', 'Joe Wicks', 'RealLifeBooks'),
('10200', 'My Favourite Recipes', 'Spencer Carter', 'RealLifeBooks');

```

5

DBeaver 5.2.0 - Book...

	book_id	title	author	publisher
1	10200	My Favourite Recipes	Spencer Carter	RealLifeBooks
2	12934	30 Minute Meals	Joe Wicks	RealLifeBooks
3	37609	Angels & Demons	Dan Brown	HighBridge Audio
4	39599	The Lord of the Rings	J. R. R. Tolkien	HighBridge Audio
5	40352	Brave New World	Aldous Huxley	Recorded Books
6	42802	Animal Farm	George Orwell	Recorded Books
7	43237	The Kite Runner	Khaled Hosseini	Tom media
8	43592	Jane Eyre	Charlotte Brontë	Tantor Media
9	45447	The Hunger Games	Suzanne Collins	Tom media
10	47303	Twilight	Stephenie Meyer	Urban Romantics
11	49382	This is life	Elliot K Kirby	RealLifeBooks
12	53376	The Great Gatsby	F. Scott Fitzgerald	Solis Press
13	55564	The Catcher in the Rye	J. D. Salinger	Urban Romantics
14	58448	The Da Vinci Code	Dan Brown	Solis Press
15	59541	Pride and Prejudice	Jane Austen	Solis Press

6

This is the table and values of Supplier.

```

CREATE TABLE Supplier_(
supplier_id CHAR(5)PRIMARY KEY,
name VARCHAR(30)NOT NULL,
account_no CHAR(16)NOT NULL,
email CHAR(30)NOT NULL
);

INSERT INTO Supplier_ VALUES
('68914','Charlotte J Sanders','4532233710293628','rnukj@claimab.com'),
('18293','Luca A Parker','4916291593063555','rnuahct2kj@claimab.com'),
('10283','Scarlett M Sheppard','4716255974219518','6lncmkrsoyb@payspun.com'),
('29381','Charlie S Cole','5126746233058482','wpydmy8ewx@claimab.com'),
('38293','Samuel M McDonald','4556003141517072','nwjfnbb49qq@payspun.com'),
('19203','Niamh R Akhtar','4556366096543660','wt8goba9tar@payspun.com'),
('10293','Muhammad','5597294292322119','a8fczcb9vc0iffymedia.com'),
('29374','Corey','5415927718262290','8hu7onk4i9b@claimab.com'),
('38402','Declan','5537906453657412','q8qrhco19ei@claimab.com'),
('39247','Harriet','4485077242461295','sdf@claimab.com');
    
```

7

DBeaver 5.2.0 - Supplier\_

The screenshot shows the DBeaver interface with the 'Supplier' database selected. The 'Supplier' table is open, displaying 10 rows of data. The columns are: supplier\_id, name, account\_no, and email. The data includes various names like Scarlett M Sheppard, Muhammad, Luca A Parker, etc., along with their respective account numbers and emails.

	supplier_id	name	account_no	email
1	10283	Scarlett M Sheppard	4716255974219518	6lncmkr0yb@payspun.com
2	10293	Muhammad	5597294292322119	a8fzcbp9vcp@iffymedia.com
3	18293	Luca A Parker	4916291593063555	rnuahct2kj@claimab.com
4	19203	Niamh R Akhtar	4556366096543660	wt8goba9tar@payspun.com
5	29374	Corey	5415927718262290	8hu7onk49b@claimab.com
6	29381	Charlie S Cole	5126746233058482	wpydmy8ewx@claimab.com
7	38293	Samuel M McDonald	4556003141517072	nwjfnbb49qq@payspun.com
8	38402	Declan	5537906453657412	q8qrhco19ei@claimab.com
9	39247	Harriet	4485077242461295	sdf@claimab.com
10	68914	Charlotte J Sanders	4532233710293628	rnukj@claimab.com

8

This is the table and values of Edition.

DBeaver 5.2.0 - <yh45>\_assn2.sql

The screenshot shows the DBeaver interface with the 'Edition' table being created. The SQL code defines the table structure with columns: book\_id (CHAR(5)), edition (VARCHAR(5)), book\_type (VARCHAR(15) NOT NULL), price (NUMERIC(5,2) NOT NULL), and quantity\_in\_stock (VARCHAR(5) NOT NULL). It also includes a primary key constraint on (book\_id, edition) and a foreign key constraint linking book\_id to the Book table. Below the table definition, there is an 'INSERT INTO Edition VALUES' statement with 20 data rows. The data includes various book IDs, editions, book types, prices, and quantities.

```

CREATE TABLE Edition_(
    book_id CHAR(5),
    edition VARCHAR(5),
    book_type VARCHAR(15) NOT NULL,
    price NUMERIC(5,2) NOT NULL,
    quantity_in_stock VARCHAR(5) NOT NULL,
    PRIMARY KEY(book_id, edition),
    FOREIGN KEY(book_id) REFERENCES Book_(book_id)
);

INSERT INTO Edition_ VALUES
('59541','6','Hardcover','012.50','100'),
('59541','8','Paperback','010.50','150'),
('59541','2','Audioversion','030.50','50'),
('58448','5','Paperback','011.50','20'),
('55564','3','Hardcover','009.50','100'),
('55564','1','Audioversion','015.50','50'),
('53376','5','Paperback','010.50','60'),
('53376','2','Audioversion','013.50','20'),
('47383','6','Audioversion','034.00','100'),
('45447','4','Paperback','005.50','20'),
('45447','2','Audioversion','010.50','20'),
('45447','5','Hardcover','006.50','100'),
('45447','15','Paperback','004.50','50')

```

9

DBeaver 5.2.0 - Edition...

The screenshot shows a table named 'Edition' with the following data:

	book_id	edition	book_type	price	quantity_in_stock
1	10200	2	Audioversion	82.00	8
2	12934	6	Audioversion	39.00	8
3	37609	6	Audioversion	34.00	9
4	39599	6	Audioversion	9.50	10
5	40352	5	Hardcover	4.50	9
6	42802	4	Paperback	5.50	8
7	43237	9	Paperback	5.50	20
8	43592	2	Audioversion	10.50	8
9	43592	5	Paperback	4.50	7
10	43592	6	Hardcover	5.50	6
11	45447	2	Audioversion	10.50	9
12	45447	4	Paperback	5.50	6
13	45447	5	Hardcover	6.50	8
14	47303	6	Audioversion	34.00	5
15	49382	3	Hardcover	21.00	9
16	53376	2	Audioversion	13.50	7
17	53376	5	Paperback	10.50	6
18	55564	1	Audioversion	15.50	7
19	55564	3	Hardcover	9.50	5
20	58448	5	Paperback	11.50	9
21	59541	2	Audioversion	30.50	8
22	59541	6	Hardcover	12.50	8
23	59541	8	Paperback	10.50	10

10

This is the table and values of Review.

DBeaver 5.2.0 - <yh45>.assn2.sql

```

CREATE TABLE Review_(
    book_id CHAR(5),
    customer_id CHAR(8),
    rating CHAR(1),
    PRIMARY KEY(book_id, customer_id),
    FOREIGN KEY(book_id) REFERENCES Book_(book_id),
    FOREIGN KEY(customer_id) REFERENCES Customer_(customer_id);

INSERT INTO Review_ VALUES
('59541','10783923','8'),
('58448','10783923','7'),
('55564','21243453','6'),
('53376','21243453','7'),
('47303','38768765','8'),
('45447','38768765','6'),
('43592','48490982','5'),
('43237','53925542','7'),
('42802','62836788','7'),
('40352','78394432','5'),
('39599','88493028','8'),
('37609','90383020','9'),
('49382','90383020','9'),
('12934','90383020','8')

```

11

DBeaver 5.2.0 - Review...

MariaDB - yh45.host.cs.st <None> 200 Quick Access

\*<yh45>\_assn2.sql Script-7.sql Edition... Review...

Properties Data ER Diagram MariaDB - yh45.host.cs.st-andrews.ac.uk Databases Tables Review...

Review... Enter a SQL expression to filter results (use Ctrl+Space)

book\_id customer\_id rating

	book_id	customer_id	rating
1	10200	90383020	7
2	12934	90383020	9
3	37609	90383020	9
4	39599	88493028	8
5	40352	78394432	5
6	42802	62836788	7
7	43237	53925542	7
8	43592	48490982	5
9	45447	38768765	6
10	47303	38768765	8
11	49382	90383020	9
12	53376	21243453	7
13	55564	21243453	6
14	58448	10783923	7
15	59541	10783923	8

Properties

Name	Value
General	MariaDB -
	01/11/18 1
	Development
Servers	
Drivers	

Databases

- Users
- Administrator
- System Info

12

This is the table and values of Order\_Place.

DBeaver 5.2.0 - <yh45>\_assn2.sql

MariaDB - yh45.host.cs.st <None> 200 Quick Access

\*<yh45>\_assn2.sql Script-7.sql Edition... Review...

```

CREATE TABLE Order_Place (
    order_id CHAR(10),
    customer_id CHAR(8),
    PRIMARY KEY(order_id, customer_id),
    FOREIGN KEY(order_id) REFERENCES Order_(order_id),
    FOREIGN KEY(customer_id) REFERENCES Customer_(customer_id));

INSERT INTO Order_Place VALUES
('1738466826', '10783923'),
('1802898345', '18293710'),
('1811279090', '21243453'),
('1820393587', '38768765'),
('1820980738', '48490982'),
('1822398093', '53925542'),
('1837002857', '62836788'),
('1837873829', '78394432'),
('1839402720', '88493028'),
('1898099282', '90383020');

```

Properties

Name	Value
General	MariaDB -
	01/11/18 1
	Development
Servers	
Drivers	

Databases

- Users
- Administrator

13

DBeaver 5.2.0 - Review\_

MariaDB - <yh45>\_assn2.sql Script-7.sql Edition\_ Review\_

Properties Data ER Diagram

Review\_ | Enter a SQL expression to filter results (use Ctrl+Space)

	book_id	customer_id	rating
1	10200	90383020	7
2	12934	90383020	9
3	37609	90383020	9
4	39599	88493028	8
5	40352	78394432	5
6	42802	62836788	7
7	43237	53925542	7
8	43592	48490982	5
9	45447	38768765	6
10	47303	38768765	8
11	49382	90383020	9
12	53376	21243453	7
13	55564	21243453	6
14	58448	10783923	7
15	59541	10783923	8

Properties

Name Value

General MariaDB ->

Date 01/11/18 1

Development

Server

Driver

to view or hide

Databases

Users

Administrator

System Info

14

This is the table and values of Contain.

DBeaver 5.2.0 - <yh45>\_assn2.sql

MariaDB - <yh45>\_assn2.sql Script-7.sql Edition\_ Review\_

```

CREATE TABLE Contain_(
    book_id CHAR(5),
    order_id CHAR(10),
    edition VARCHAR(5) NOT NULL,
    PRIMARY KEY(order_id, book_id, edition),
    FOREIGN KEY(order_id) REFERENCES Order_(order_id),
    FOREIGN KEY(book_id) REFERENCES Book_(book_id);

INSERT INTO Contain_VALUES
('59541','1738466826','6'),
('58448','1802898345','5'),
('10200','1811279090','2'),
('55564','1820393587','3'),
('53376','1820980738','5'),
('47303','1822398093','6'),
('45447','1837002857','4'),
('43592','1837873829','5'),
('43237','1839402720','9'),
('42802','1898099282','4'),
('40352','1898099282','5'),
('39599','1738466826','6'),
('37609','1738466826','6'),
('49382','1839402720','3'),
('12934','1837873829','6').

```

Properties

Name Value

General MariaDB ->

Date 01/11/18 1

Development

Server

Driver

Statistics

Databases

Users

Administrator

15

DBeaver 5.2.0 - Contain...

The screenshot shows a DBeaver interface with a table named 'Contain...'. The table has three columns: book\_id, order\_id, and edition. The data consists of 15 rows:

	book_id	order_id	edition
1	37609	1738466826	6
2	39599	1738466826	6
3	59541	1738466826	6
4	58448	1802898345	5
5	10200	1811279090	2
6	55564	1820393587	3
7	53376	1820980738	5
8	47303	1822398093	6
9	45447	1837002857	4
10	12934	1837873829	6
11	43592	1837873829	5
12	43237	1839402720	9
13	49382	1839402720	3
14	40352	1898099282	5
15	42802	1898099282	4

16

This is the table and values of Supplies.

DBeaver 5.2.0 - <yh45>.assn2.sql

```

CREATE TABLE Supplies_(
    supplier_id CHAR(5),
    book_id CHAR(5),
    supply_price NUMERIC(5,2)NOT NULL,
    PRIMARY KEY(supplier_id, book_id),
    FOREIGN KEY(supplier_id) REFERENCES Supplier_(supplier_id),
    FOREIGN KEY(book_id) REFERENCES Book_(book_id);

INSERT INTO Supplies_ VALUES
('10283','59541','003.50'),
('10293','58448','004.50'),
('10283','58448','003.50'),
('18293','10200','005.50'),
('38293','10200','004.50'),
('19203','10200','004.20'),
('19203','55564','003.50'),
('29374','53376','003.50'),
('29381','47303','003.50'),
('38293','45447','002.50'),
('38402','43592','003.50'),
('39247','43237','003.50'),
('68914','42802','004.50'),
('10283','40352','004.50'),

```

17

DBeaver 5.2.0 - Supplies\_

Properties Data ER Diagram

Supplies\_ Enter a SQL expression to filter results (use Ctrl+Space)

	supplier_id	book_id	supply_price
1	10283	40352	4.50
2	10283	58448	3.50
3	10283	59541	3.50
4	10293	40352	5.50
5	10293	58448	4.50
6	18293	10200	5.50
7	18293	37609	4.50
8	19203	10200	4.20
9	19203	49382	5.50
10	19203	55564	3.50
11	29374	12934	5.50
12	29374	53376	3.50
13	29381	47303	3.50
14	38293	10200	4.50
15	38293	45447	2.50
16	38402	43592	3.50
17	39247	43237	3.50
18	68914	42802	4.50

18

This is the table and values of Customer\_phone.

DBeaver 5.2.0 - <yh45>\_assn2.sql

```

CREATE TABLE Customer_phone_
(
customer_id CHAR(8),
customer_phone_number CHAR(13),
customer_phone_type VARCHAR(20) NOT NULL,
PRIMARY KEY(customer_id, customer_phone_number),
FOREIGN KEY(customer_id) REFERENCES Customer_(customer_id));

INSERT INTO Customer_phone_ VALUES
('18293710','078 2981 8630','mobilephone'),
('21243453','070 5512 4228','telephone'),
('38768765','077 1322 1591','telephone'),
('48499982','078 7769 7401','telephone'),
('53925542','079 5549 1519','mobilephone'),
('62836788','078 7026 2822','telephone'),
('78394432','079 2059 4666','telephone'),
('88493028','070 8277 5651','mobilephone'),
('90383020','079 1310 5251','mobilephone'),
('10783923','078 2223 3475','mobilephone');

```

19

DBeaver 5.2.0 - Customer\_phone\_

MariaDB - <yh45>\_assn2.sql Script-7.sql Edition\_ Supplies\_ Customer\_phone\_

Properties Data ER Diagram

Customer\_phone\_ | Enter a SQL expression to filter results (use Ctrl+Space)

	customer_id	customer_phone_number	customer_phone_type
1	18293710	078 2981 8630	mobilephone
2	21243453	070 5512 4228	telephone
3	38768765	077 1322 1591	telephone
4	48490982	078 7769 7401	telephone
5	53925542	079 5549 1519	mobilephone
6	62836788	078 7026 2822	telephone
7	78394432	079 2059 4666	telephone
8	88493028	070 8277 5651	mobilephone
9	90383020	079 1310 5251	mobilephone
10	10783923	078 2223 3475	mobilephone

Properties

Name Value

General MariaDB ->

Date 01/11/18 1

Development

Server

Driver

! to view or hide

Database

20

This is the table and values of Supplier\_phone.

DBeaver 5.2.0 - <yh45>\_assn2.sql

MariaDB - <yh45>\_assn2.sql Script-7.sql Edition\_ Supplies\_

```

CREATE TABLE Supplier_phone_(
    supplier_id CHAR(5),
    supplier_phone_number CHAR(13),
    supplier_phone_type VARCHAR(20)NOT NULL,
    PRIMARY KEY(supplier_id, supplier_phone_number),
    FOREIGN KEY(supplier_id) REFERENCES Supplier_(supplier_id);
)

INSERT INTO Supplier_phone_ VALUES
('68914', '079 0330 2713', 'mobilephone'),
('18293', '079 5714 9984', 'mobilephone'),
('10283', '070 6951 9975', 'mobilephone'),
('29381', '070 3074 2734', 'mobilephone'),
('38293', '079 4413 8752', 'mobilephone'),
('19203', '077 5711 8796', 'telephone'),
('10293', '070 4285 4957', 'telephone'),
('29374', '078 4443 7359', 'telephone'),
('38402', '077 6137 4167', 'telephone'),
('39247', '070 1106 3157', 'telephone');

CREATE TABLE Genre_ (

```

Properties

Name Value

General MariaDB ->

Date 01/11/18 1

Development

Server

Driver

Database

Users

21

DBeaver 5.2.0 - Supplier\_phone\_

The screenshot shows the DBeaver interface with the 'Supplier\_phone\_' table selected. The table has three columns: 'supplier\_id', 'supplier\_phone\_number', and 'supplier\_phone\_type'. The data is as follows:

	supplier_id	supplier_phone_number	supplier_phone_type
1	68914	079 0330 2713	mobilephone
2	18293	079 5714 9984	mobilephone
3	10283	070 6951 9975	mobilephone
4	29381	070 3074 2734	mobilephone
5	38293	079 4413 8752	mobilephone
6	19203	077 5711 8796	telephone
7	10293	070 4285 4957	telephone
8	29374	078 4443 7359	telephone
9	38402	077 6137 4167	telephone
10	39247	070 1106 3157	telephone

22

This is the table and values of Genre.

DBeaver 5.2.0 - <yh45>\_assn2.sql

```

CREATE TABLE Genre_ (
book_id CHAR(5) PRIMARY KEY,
genre VARCHAR(20) NOT NULL;
FOREIGN KEY(book_id) REFERENCES Book_(book_id);

INSERT INTO Genre_ VALUES
('59541','classic'),
('58448','fiction'),
('55564','classic'),
('53376','fiction '),
('47303','fiction'),
('45447','adventure'),
('43592','romance'),
('43237','fiction'),
('42802','politics'),
('40352','fiction'),
('39599','adventure'),
('37609','fiction'),
('49382','Cookery'),
('12934','Cookery'),
('10200','Cookery');

```

23

The screenshot shows the DBeaver 5.2.0 interface with the 'Genre\_' table selected. The table has two columns: 'book\_id' and 'genre'. The data is as follows:

book_id	genre
10200	Cookery
12934	Cookery
37609	fiction
39599	adventure
40352	fiction
42802	politics
43237	fiction
43592	romance
45447	adventure
47303	fiction
49382	Cookery
53376	fiction
55564	classic
58448	fiction
59541	classic

The right side of the interface includes a properties panel and a system info panel.

## Task 3: SQL Data Manipulation

1. List all books published by "RealLifeBooks" which are in the "Cookery" genre;

The screenshot shows the DBeaver 5.2.0 interface with the following details:

- File Bar:** File, Edit, Navigate, Search, SQL Editor, Database, Window, Help.
- Toolbar:** Commit, Rollback, Auto, Quick Access.
- Database Navigator:** Shows the connection to MariaDB - yh45.host.cs.st-andrews.ac.uk and the database yh45\_assn2. Under Tables, the Edition\_ table is selected, showing its columns: book\_id, edition, book\_type, price, quantity\_in\_stock, Constraints, and Foreign Keys.
- SQL Editor:** Contains the following SQL query:

```
use yh45_assn2;
SELECT Book_.book_id, title, author, publisher, genre
FROM Book_, Genre_
WHERE Book_.book_id = Genre_.book_id
and publisher = 'RealLifeBooks'
and genre = 'Cookery';
```
- Results Grid:** Displays the results of the query in a grid format. The columns are book\_id, title, author, publisher, and genre. The data is as follows:

	book_id	title	author	publisher	genre
1	10200	My Favourite Recipes	Spencer Carter	RealLifeBooks	Cookery
2	12934	30 Minute Meals	Joe Wicks	RealLifeBooks	Cookery
3	49382	This is life	Elliot K Kirby	RealLifeBooks	Cookery

At the bottom, it says "3 row(s) fetched - 2ms (+1ms)".

2.List all order placed by customers with addresses in the city of Dundee, since 2013, in order of date , latest first;

The screenshot shows the DBeaver 5.2.0 interface with the following details:

- Toolbar:** File, Edit, Navigate, Search, SQL Editor, Database, Window, Help.
- Database Selection:** MariaDB - yh45.host.cs.st-andrews.ac.uk
- SQL Editor:** The query is:use yh45\_assn2;  
SELECT Order\_.order\_id, delivery\_city, date\_ordered, date\_delivered  
FROM Order\_  
WHERE Order\_.delivery\_city = 'DUNDEE'  
AND date\_ordered >= 20130000;
- Results Grid:** Shows two rows of data from the Order\_ table.

	order_id	delivery_city	date_ordered	date_delivered
1	1811279090	DUNDEE	2016-02-03	2016-02-04
2	1820980738	DUNDEE	2013-01-05	2013-01-14

- Message Bar:** 2 row(s) fetched - 2ms
- Status Bar:** GMT, en\_GB, Writable, Smart Insert, 6 : 30

3. List all book editions which have less than 10 items in stock, together with the name , account number and supply price of the minimum priced supplier for that edition.

DBeaver 5.2.0 - <MariaDB - yh45.host.cs.st-andrews.ac.uk> Script-3

MariaDB - yh45.host.cs.st-andrews.ac.uk <None> 200 Quick Access

\*<yh45>\_assn2.sql \*<MariaDB - yh45.host.cs.st-andrews.ac.uk> Script \*<MariaDB - yh45.host.cs.st-andrews.ac.uk> Script-3 Supplies\_ MariaDB Properties

```
use yh45_assn2;
SELECT book_id, title, edition, quantity_in_stock, name, account_no, min(supply_price)
FROM Book_ NATURAL JOIN Edition_ NATURAL JOIN Supplier_ NATURAL JOIN Supplies_
WHERE quantity_in_stock < 10
GROUP BY edition, book_id
```

Book\_(+)

SELECT book\_id, title, edition, quantity\_in\_stock, name, account\_no, min(supply\_price) Enter a SQL expression to filter results (use Ctrl+Space)

book_id	title	edition	quantity_in_stock	name	account_no	min(supply_price)
8	The Catcher in the Rye	3	5	Niamh R Akhtar	4556366096543660	3.50
9	Animal Farm	4	8	Charlotte J Sanders	4532233710293628	4.50
10	The Hunger Games	4	6	Samuel M McDonald	4556003141517072	2.50
11	Brave New World	5	9	Scarlett M Sheppard	4716255974219518	4.50
12	Jane Eyre	5	7	Declan	5537906453657412	3.50
13	The Hunger Games	5	8	Samuel M McDonald	4556003141517072	2.50
14	The Great Gatsby	5	6	Corey	5415927718262290	3.50
15	The Da Vinci Code	5	9	Scarlett M Sheppard	4716255974219518	3.50
16	30 Minute Meals	6	8	Corey	5415927718262290	5.50
17	Angels & Demons	6	9	Luca A Parker	4916291593063555	4.50
18	Jane Eyre	6	6	Declan	5537906453657412	3.50
19	Twilight	6	5	Charlie S Cole	5126746233058482	3.50
20	Pride and Prejudice	6	8	Scarlett M Sheppard	4716255974219518	3.50

Save Cancel Script | Record Panels Grid Text | 20 row(s) fetched - 4ms | 1 items

4. List all books published at least 5<sup>th</sup> edition, together with the book's name, author and publisher.

DBeaver 5.2.0 - <MariaDB - yh45.host.cs.st-andrews.ac.uk> Script-4

MariaDB - yh45.host.cs.st-andrews.ac.uk <None> 200 Quick Access

use yh45\_assn2;

```
SELECT Book_book_id, title, author, edition
FROM Book, Edition
WHERE Book.book_id = Edition.book_id
and edition >= 5;
```

Properties

Name	Value
Genre	MariaDB -
Created	01/11/18 1
Development	Development
Server	Server
Driver	Driver

Databases

Users

Administrator

System Info

Book\_(+)

SELECT Book\_book\_id Enter a SQL expression to filter results (use Ctrl+Space)

book_id	title	author	edition
1	30 Minute Meals	Joe Wicks	6
2	Angels & Demons	Dan Brown	6
3	The Lord of the Rings	J. R. R. Tolkien	6
4	Brave New World	Aldous Huxley	5
5	The Kite Runner	Khaled Hosseini	9
6	Jane Eyre	Charlotte Brontë	5
7	Jane Eyre	Charlotte Brontë	6
8	The Hunger Games	Suzanne Collins	5
9	Twilight	Stephenie Meyer	6
10	The Great Gatsby	F. Scott Fitzgerald	5

Save Cancel Script | Record Panels | Smart Insert | 3 : 15

13 row(s) fetched - 2ms

Grid Text

1 items

5. List all books have at least 8 grade rating, recording the book's title, id and genre.

DBeaver 5.2.0 - <MariaDB - yh45.host.cs.st-andrews.ac.uk> Script-4

MariaDB - yh45.host.cs.st-andrews.ac.uk <None> 200 Quick Access

\*<yh45>\_assn2.sql <MariaDB - yh45.host.cs.st-andrews.ac... <None> Edition\_ Customer\_phone\_ Review\_ MariaDB Properties

```
use yh45_assn2;
SELECT Book_.book_id, title, author, rating
FROM Book_, Review
WHERE Book_.book_id = Review_.book_id
AND rating >= 8;
```

Book\_(+)

SELECT Book\_.book\_id Enter a SQL expression to filter results (use Ctrl+Space)

	book_id	title	author	rating
1	12934	30 Minute Meals	Joe Wicks	9
2	37609	Angels & Demons	Dan Brown	9
3	39599	The Lord of the Rings	J. R. R. Tolkien	8
4	47303	Twilight	Stephenie Meyer	8
5	49382	This is life	Elliot K Kirby	9
6	59541	Pride and Prejudice	Jane Austen	8

Save Cancel Script | Record Panels Grid Text | 6 row(s) fetched - 2ms | 6

Properties

Name	Value
Genre	MariaDB - 1
Published Date	01/11/18 1
Series	Development
Driver	Driver

Databases  
Users  
Administrator  
System Info

1 items

6.List the customers who ordered after 2016, together with the book's title and the customers name and email.

DBeaver 5.2.0 - <MariaDB - yh45.host.cs.st-andrews.ac.uk> Script-5

MariaDB - yh45.host.cs.st-andrews.ac.uk <None> 200 Quick Access

use yh45 assn2;

```
SELECT Customer_.name, email, title, author, date_ordered
FROM Customer_ natural join Book_ natural join Order_ natural join Contain_ natural join Order_Place_
WHERE date_ordered=>20160000;
```

Properties

Name	Value
General	MariaDB - yh45 host.cs.st-andrews.ac.uk 01/11/18 1 Development
Server	
Driver	

Databases

Customer\_(+)

SELECT Customer\_... Enter a SQL expression to filter results (use Ctrl+Space)

	name	email	title	author	date_ordered
1	Tyler Oliver	542600@gene.net	My Favourite Recipes	Spencer Carter	2016-02-03
2	Oliver S Townsend	l345@mail.net	The Hunger Games	Suzanne Collins	2018-02-03

Save Cancel Script | Record Panels Grid Text

2 row(s) fetched - 2ms

1 items

GMT en\_GB Writable Smart Insert 1 : 5

The screenshot shows the DBeaver interface with a query editor and a results grid. The query is a multi-table join selecting customer names, emails, book titles, authors, and order dates. The results grid displays two rows of data from the Customer table. The interface includes various toolbars, a properties panel, and a database navigation sidebar.

	name	email	title	author	date_ordered
1	Tyler Oliver	542600@gene.net	My Favourite Recipes	Spencer Carter	2016-02-03
2	Oliver S Townsend	l345@mail.net	The Hunger Games	Suzanne Collins	2018-02-03

Create at least two appropriate views:

1. A customer wants to find basic information about all fiction books.

DBeaver 5.2.0 - <MariaDB - yh45.host.cs.st-andrews.ac.uk> Script-6

MariaDB - yh45.host.cs.st-andrews.ac.uk <None> 200 Quick Access

\*<yh45>\_assn2.sql \*<MariaDB - yh45.host.cs.st-andrews.ac.uk> Script-6 Script-4.sql Genre\_ yh45\_assn2 fiction\_book

```
use yh45_assn2;
CREATE VIEW fiction_book AS
SELECT genre, title, author, publisher, price
FROM Book_ NATURAL JOIN Edition_ NATURAL join Genre_
WHERE Book_.book_id = Edition_.book_id
AND genre='fiction';
```

Statistics

CREATE VIEW fiction | Enter a SQL expression to filter results (use Ctrl+Space)

Name	Value
Updated Rows	0
Query	CREATE VIEW fiction_book AS SELECT genre, title, author, publisher, price FROM Book_ NATURAL JOIN Edition_ NATURAL join Genre_ WHERE Book_.book_id = Edition_.book_id AND genre='fiction'
Finish time	Thu Nov 01 23:04:01 GMT 2018

31

DBeaver 5.2.0 - fiction\_book

MariaDB - yh45.host.cs.st-andrews.ac.uk <None> 200 Quick Access

\*<yh45>\_assn2.sql \*<MariaDB - yh45.host.cs.st-andrews.ac.uk> Script-6 Script-4.sql Genre\_ yh45\_assn2 fiction\_book

Properties Data ER Diagram MariaDB - yh45.host.cs.st-andrews.ac.uk Databases Views fiction\_book

fiction\_book | Enter a SQL expression to filter results (use Ctrl+Space)

	abc genre	abc title	abc author	abc publisher	123 price
1	fiction	Angels & Demons	Dan Brown	HighBridge Audio	34.00
2	fiction	Brave New World	Aldous Huxley	Recorded Books	4.50
3	fiction	The Kite Runner	Khaled Hosseini	Tom media	5.50
4	fiction	Twilight	Stephenie Meyer	Urban Romantics	34.00
5	fiction	The Great Gatsby	F. Scott Fitzgerald	Solis Press	13.50
6	fiction	The Great Gatsby	F. Scott Fitzgerald	Solis Press	10.50
7	fiction	The Da Vinci Code	Dan Brown	Solis Press	11.50

Properties

Name	Value
Genre	MariaDB - yh45.host.cs.st-andrews.ac.uk
fiction	01/11/18 1 Development
Server	
Driver	

2. Bookstore employees hope to find all books with less than ten books in stock.

The screenshot shows the DBeaver 5.2.0 interface with a MariaDB connection to 'yh45.host.cs.st-andrews.ac.uk'. A new view named 'book\_quantity' is being created in the 'assn2.sql' script tab. The SQL code is:

```
use yh45_assn2;
CREATE VIEW book_quantity AS
SELECT quantity_in_stock, title, author, publisher, price, book_type
FROM Book_ NATURAL JOIN Edition_
WHERE Book_.book_id = Edition_.book_id
AND quantity_in_stock<10;
```

The 'Properties' panel on the right shows general settings for the connection. The 'Statistics' panel below the query editor displays the following information:

Name	Value
Updated Rows	0
Query	CREATE VIEW book_quantity AS SELECT quantity_in_stock, title, author, publisher, price, book_type FROM Book_ NATURAL JOIN Edition_ WHERE Book_.book_id = Edition_.book_id AND quantity_in_stock<10
Finish time	Thu Nov 01 23:25:12 GMT 2018

The status bar at the bottom indicates '1 row(s) fetched - 2ms'.

DBeaver 5.2.0 - book\_quantity

The screenshot shows a DBeaver interface with the following details:

- Database:** MariaDB - yh45.host.cs.st-andrews.ac.uk
- Table:** book\_quantity
- Rows:** 20
- Columns:** quantity\_in\_stock, title, author, publisher, price, book\_type
- Data Preview:**

	quantity_in_stock	title	author	publisher	price	book_type
1	8	My Favourite Recipes	Spencer Carter	RealLifeBooks	82.00	Audioversion
2	8	30 Minute Meals	Joe Wicks	RealLifeBooks	39.00	Audioversion
3	9	Angels & Demons	Dan Brown	HighBridge Audio	34.00	Audioversion
4	9	Brave New World	Aldous Huxley	Recorded Books	4.50	Hardcover
5	8	Animal Farm	George Orwell	Recorded Books	5.50	Paperback
6	8	Jane Eyre	Charlotte Brontë	Tantor Media	10.50	Audioversion
7	7	Jane Eyre	Charlotte Brontë	Tantor Media	4.50	Paperback
8	6	Jane Eyre	Charlotte Brontë	Tantor Media	5.50	Hardcover
9	9	The Hunger Games	Suzanne Collins	Tom media	10.50	Audioversion
10	6	The Hunger Games	Suzanne Collins	Tom media	5.50	Paperback
11	8	The Hunger Games	Suzanne Collins	Tom media	6.50	Hardcover
12	5	Twilight	Stephenie Meyer	Urban Romantics	34.00	Audioversion
13	9	This is life	Elliot K Kirby	RealLifeBooks	21.00	Hardcover
14	7	The Great Gatsby	F. Scott Fitzgerald	Solis Press	13.50	Audioversion
15	6	The Great Gatsby	F. Scott Fitzgerald	Solis Press	10.50	Paperback
16	7	The Catcher in the Rye	J. D. Salinger	Urban Romantics	15.50	Audioversion
17	5	The Catcher in the Rye	J. D. Salinger	Urban Romantics	9.50	Hardcover
18	9	The Da Vinci Code	Dan Brown	Solis Press	11.50	Paperback
19	8	Pride and Prejudice	Jane Austen	Solis Press	30.50	Audioversion
20	8	Pride and Prejudice	Jane Austen	Solis Press	12.50	Hardcover
- Bottom Status Bar:** 20 row(s) fetched - 1ms
- Right Panel:** Shows system information for MariaDB, including General, Processes, Schemas, Users, Administrate, and System Info.

34

## Task 4: Reflection

I think that overall, if you take classes seriously and read more related books in the next class, then this assignment is not difficult.

For me, the more troublesome is that when I made the form, I usually encounter various small errors, such as semantics, spelling, etc., so it reduces efficiency. Also, when inputting values, because a large amount of values were input, it took me a lot of time to collect data. In the production of the corresponding SQL queries, there was a lot of repetition because there was no use of natural join. Later, I asked my classmates for help, and I just finished the modification.