

DDL Script to generate Database:

```
drop database if exists BookStore;  
create database BookStore;  
use Bookstore;
```

```
drop table if exists Author;  
create table Author  
(  
    Author_ID INT,  
    Author_Name VARCHAR(45),  
    Author_Address VARCHAR(450),  
    PRIMARY KEY(`Author_ID`)  
);
```

```
drop table if exists Publisher;  
create table Publisher  
(  
    Publisher_ID INT,  
    Publisher_Name VARCHAR(45),  
    Publisher_Phone INT,  
    Publisher_URL VARCHAR(45),  
    Publisher_Address VARCHAR(450),  
    PRIMARY KEY(`Publisher_ID`)  
);
```

```
drop table if exists Warehouse;  
create table Warehouse  
(  
    code INT,  
    Warehouse_Phone VARCHAR(10),  
    Warehouse_Address VARCHAR(450),  
    PRIMARY KEY(`code`)  
);
```

```
drop table if exists Customer;  
create table Customer
```

```
(
    Customer_Email VARCHAR(45),
    Customer_Name VARCHAR(45),
    Customer_Phone INT,
    Customer_Address VARCHAR(450),
    PRIMARY KEY(`Customer_Email`)
);
```

```
drop table if exists Shopping_Basket;
create table Shopping_Basket
```

```
(
    Shopping_Basket_ID INT,
    Customer_Email VARCHAR(45) NOT NULL,
    Primary KEY(`Shopping_Basket_ID`),
    CONSTRAINT `VALIDATE_USER` FOREIGN KEY (`Customer_Email`) references `BookStore`.`Customer`(`Customer_Email`)
);
```

```
drop table if exists Book;
create table Book
```

```
(
    ISBN VARCHAR(20),
    Book_Year YEAR(4),
    Book_Title VARCHAR(200),
    Book_Price FLOAT,
    Publisher_ID INT,
    Author_ID INT,
    PRIMARY KEY (`ISBN`),
    CONSTRAINT `VALIDATE_PUBLISHER` FOREIGN KEY (`Publisher_ID`) REFERENCES `BookStore`.`Publisher`(`Publisher_ID`),
    CONSTRAINT `VALIDATE_AUTHOR` FOREIGN KEY (`Author_ID`) REFERENCES `BookStore`.`Author`(`Author_ID`)
);
```

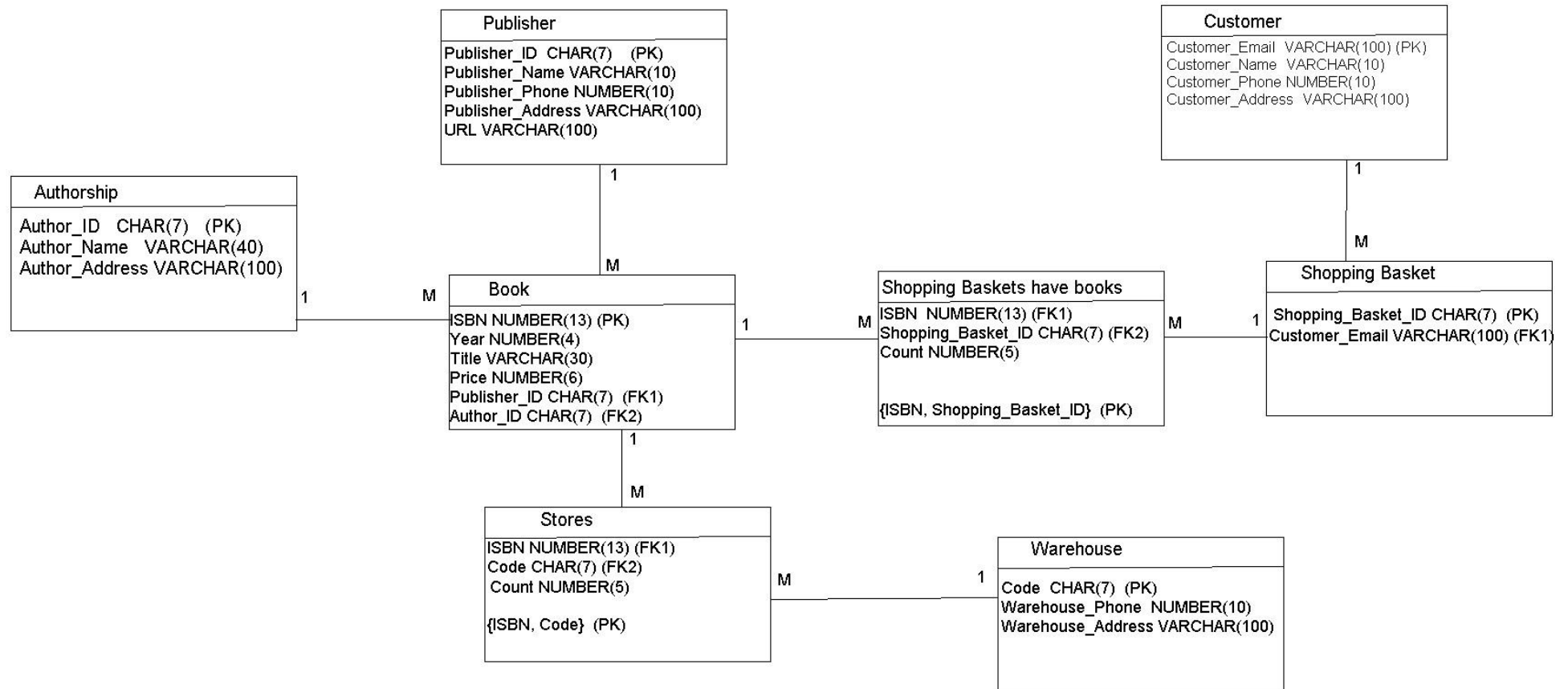
```
drop table if exists Shopping_Basket_Have_Books;
create table Shopping_Basket_Have_Books
```

```
(
    ISBN VARCHAR(20),
    Shopping_Basket_ID INT,
    Book_Count INT,
    PRIMARY KEY(`ISBN`,`Shopping_Basket_ID`),
```

```
CONSTRAINT `VALIDATE_ISBN` FOREIGN KEY(`ISBN`) REFERENCES `BookStore`.`Book`(`ISBN`),  
CONSTRAINT `VALIDATE_SHOPPING_BASKET_ID` FOREIGN KEY (`Shopping_Basket_ID`) REFERENCES  
`BookStore`.`Shopping_Basket`(`Shopping_Basket_ID`)  
);
```

```
drop table if exists Warehouses_Have_Books;  
create table Warehouses_Have_Books  
(  
    ISBN VARCHAR(20),  
    Warehouse_Code INT,  
    Book_Count INT,  
    PRIMARY KEY(`ISBN`,`Warehouse_Code`),  
    CONSTRAINT `VALIDATE_WAREHOUSE_CODE` FOREIGN KEY (`Warehouse_Code`) REFERENCES `BookStore`.`Warehouse`(`code`),  
    CONSTRAINT `VALIDATE_BOOK_ISBN_2` FOREIGN KEY (`ISBN`) REFERENCES `BookStore`.`Book`(`ISBN`)  
);
```

Logical Model:



Tables Created:

The screenshot shows the MySQL Workbench interface. The 'Query 1' window contains the following SQL code:

```
1 • use BookStore;
2 • show tables;
```

The 'Result Grid' shows the output of the 'show tables' command:

Tables_in_bookstore
author
book
customer
publisher
shopping_basket
shopping_basket_have_books
warehouse
warehouses_have_books

The 'Output' window shows the execution log:

#	Time	Action	Message	Duration / Fetch
✓ 1	07:52:33	use BookStore	0 row(s) affected	0.000 sec
✓ 2	07:52:33	show tables	8 row(s) returned	0.000 sec / 0.000 sec

Author Table:

The screenshot displays the MySQL Workbench interface. The left sidebar contains the Navigator pane with sections for MANAGEMENT (Server Status, Client Connections, Users and Privileges, Status and System Variables, Data Export, Data Import/Restore), INSTANCE (Startup / Shutdown, Server Logs, Options File), and PERFORMANCE (Dashboard, Performance Reports, Performance Schema Setup). Below this are tabs for Administration and Schemas, and a section for Information showing 'No object selected'. The main workspace is divided into several panes. The top pane shows the SQL editor with the query 'describe author;'. Below it is the Result Grid pane, which displays the structure of the 'author' table. The bottom pane shows the Output window with the 'Action Output' tab selected, displaying a log of database actions.

Result Grid

Field	Type	Null	Key	Default	Extra
Author_ID	int(11)	NO	PRI	NULL	
Author_Name	varchar(45)	YES		NULL	
Author_Address	varchar(450)	YES		NULL	

Output

Action Output

#	Time	Action	Message	Duration / Fetch
1	07:52:33	use BookStore	0 row(s) affected	0.000 sec
2	07:52:33	show tables	8 row(s) returned	0.000 sec / 0.000 sec
3	09:35:21	describe author	3 row(s) returned	0.000 sec / 0.000 sec

Publisher Table:

The screenshot displays the MySQL Workbench interface. The left sidebar contains the 'Navigator' pane with sections for 'MANAGEMENT' (Server Status, Client Connections, Users and Privileges, Status and System Variables, Data Export, Data Import/Restore), 'INSTANCE' (Startup / Shutdown, Server Logs, Options File), and 'PERFORMANCE' (Dashboard, Performance Reports, Performance Schema Setup). Below this are tabs for 'Administration' and 'Schemas', and a section for 'Information' showing 'No object selected'.

The main workspace is divided into two panes. The top pane, titled 'Query 1', contains the SQL query: `describe publisher;`. The bottom pane, titled 'Result 5', displays the output of the query in a table format. The table has columns: Field, Type, Null, Key, Default, and Extra. The data rows are:

Field	Type	Null	Key	Default	Extra
Publisher_ID	int(11)	NO	PRI	HULL	
Publisher_Name	varchar(45)	YES		HULL	
Publisher_Phone	int(11)	YES		HULL	
Publisher_URL	varchar(45)	YES		HULL	
Publisher_Address	varchar(450)	YES		HULL	

The bottom right pane shows the 'Output' section with a table of action results:

#	Time	Action	Message	Duration / Fetch
1	07:52:33	use BookStore	0 row(s) affected	0.000 sec
2	07:52:33	show tables	8 row(s) returned	0.000 sec / 0.000 sec
3	09:35:21	describe author	3 row(s) returned	0.000 sec / 0.000 sec
4	09:35:54	describe publisher	5 row(s) returned	0.000 sec / 0.000 sec

Books Table:

MySQL Workbench

mysql@127.0.0.1:3306

File Edit View Query Database Server Tools Scripting Help

Navigator

MANAGEMENT

- Server Status
- Client Connections
- Users and Privileges
- Status and System Variables
- Data Export
- Data Import/Restore

INSTANCE

- Startup / Shutdown
- Server Logs
- Options File

PERFORMANCE

- Dashboard
- Performance Reports
- Performance Schema Setup

Administration Schemas

Information

No object selected

Query 1

```
1 • describe book;
```

SQL Additions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

Result Grid

Field	Type	Null	Key	Default	Extra
ISBN	varchar(20)	NO	PRI	NULL	
Book_Year	year(4)	YES		NULL	
Book_Title	varchar(200)	YES		NULL	
Book_Price	float	YES		NULL	
Publisher_ID	int(11)	YES	MUL	NULL	
Author_ID	int(11)	YES	MUL	NULL	

Result 6

Read Only Context Help Snippets

Output

Action Output

#	Time	Action	Message	Duration / Fetch
✓ 1	07:52:33	use BookStore	0 row(s) affected	0.000 sec
✓ 2	07:52:33	show tables	8 row(s) returned	0.000 sec / 0.000 sec
✓ 3	09:35:21	describe author	3 row(s) returned	0.000 sec / 0.000 sec
✓ 4	09:35:54	describe publisher	5 row(s) returned	0.000 sec / 0.000 sec
✓ 5	09:36:19	describe book	6 row(s) returned	0.000 sec / 0.000 sec

Warehouse Table:

MySQL Workbench

Navigator

MANAGEMENT

- Server Status
- Client Connections
- Users and Privileges
- Status and System Variables
- Data Export
- Data Import/Restore

INSTANCE

- Startup / Shutdown
- Server Logs
- Options File

PERFORMANCE

- Dashboard
- Performance Reports
- Performance Schema Setup

Administration Schemas

Information

No object selected

Object Info Session

Query 1

```
1 • describe warehouse;
```

Limit to 1000 rows

Result Grid

Field	Type	Null	Key	Default	Extra
code	int(11)	NO	PRI	HULL	
Warehouse_Phone	varchar(10)	YES		HULL	
Warehouse_Address	varchar(450)	YES		HULL	

Form Editor

Field Types

Query Stats

SQL Additions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

Result 7

Read Only Context Help Snippets

Output

Action Output

#	Time	Action	Message	Duration / Fetch
✓ 1	07:52:33	use BookStore	0 row(s) affected	0.000 sec
✓ 2	07:52:33	show tables	8 row(s) returned	0.000 sec / 0.000 sec
✓ 3	09:35:21	describe author	3 row(s) returned	0.000 sec / 0.000 sec
✓ 4	09:35:54	describe publisher	5 row(s) returned	0.000 sec / 0.000 sec
✓ 5	09:36:19	describe book	6 row(s) returned	0.000 sec / 0.000 sec
✓ 6	09:36:43	describe warehouse	3 row(s) returned	0.000 sec / 0.000 sec

Customer Table:

The screenshot shows the MySQL Workbench interface. The 'Query 1' tab is active, displaying the SQL query `describe customer;`. The 'Result Grid' shows the schema of the 'customer' table. The 'Action Output' pane at the bottom shows a log of database actions, including the execution of the 'describe customer' query.

Result Grid:

Field	Type	Null	Key	Default	Extra
Customer_Email	varchar(45)	NO	PRI	NULL	
Customer_Name	varchar(45)	YES		NULL	
Customer_Phone	int(11)	YES		NULL	
Customer_Address	varchar(450)	YES		NULL	

Action Output:

#	Time	Action	Message	Duration / Fetch
2	07:52:33	show tables	8 row(s) returned	0.000 sec / 0.000 sec
3	09:35:21	describe author	3 row(s) returned	0.000 sec / 0.000 sec
4	09:35:54	describe publisher	5 row(s) returned	0.000 sec / 0.000 sec
5	09:36:19	describe book	6 row(s) returned	0.000 sec / 0.000 sec
6	09:36:43	describe warehouse	3 row(s) returned	0.000 sec / 0.000 sec
7	09:37:10	describe customer	4 row(s) returned	0.000 sec / 0.000 sec

Shopping_Basket Table:

MySQL Workbench

mysql@127.0.0.1:3306

File Edit View Query Database Server Tools Scripting Help

Navigator

MANAGEMENT

- Server Status
- Client Connections
- Users and Privileges
- Status and System Variables
- Data Export
- Data Import/Restore

INSTANCE

- Startup / Shutdown
- Server Logs
- Options File

PERFORMANCE

- Dashboard
- Performance Reports
- Performance Schema Setup

Administration Schemas

Information

No object selected

Object Info Session

Query 1

```
1 • describe shopping_basket;
```

Limit to 1000 rows

SQL Additions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

Result Grid

Field	Type	Null	Key	Default	Extra
Shopping_Basket_ID	int(11)	NO	PRI	NULL	
Customer_Email	varchar(45)	NO	MUL	NULL	

Form Editor

Field Types

Query Stats

Result 9

Read Only Context Help Snippets

Output

Action Output

#	Time	Action	Message	Duration / Fetch
3	09:35:21	describe author	3 row(s) returned	0.000 sec / 0.000 sec
4	09:35:54	describe publisher	5 row(s) returned	0.000 sec / 0.000 sec
5	09:36:19	describe book	6 row(s) returned	0.000 sec / 0.000 sec
6	09:36:43	describe warehouse	3 row(s) returned	0.000 sec / 0.000 sec
7	09:37:10	describe customer	4 row(s) returned	0.000 sec / 0.000 sec
8	09:37:35	describe shopping_basket	2 row(s) returned	0.000 sec / 0.000 sec

Shopping_Basket_Have_Books Table:

The screenshot shows the MySQL Workbench interface. The left sidebar contains the Navigator, Administration, and Information panels. The main workspace displays the query 'describe shoppingBasketHaveBooks;' and its result grid. The result grid shows the following table structure:

Field	Type	Null	Key	Default	Extra
ISBN	varchar(20)	NO	PRI	NULL	
Shopping_Basket_ID	int(11)	NO	PRI	NULL	
Book_Count	int(11)	YES		NULL	

The bottom panel shows the Output window with the following log entries:

#	Time	Action	Message	Duration / Fetch
5	09:36:19	describe book	6 row(s) returned	0.000 sec / 0.000 sec
6	09:36:43	describe warehouse	3 row(s) returned	0.000 sec / 0.000 sec
7	09:37:10	describe customer	4 row(s) returned	0.000 sec / 0.000 sec
8	09:37:35	describe shoppingBasket	2 row(s) returned	0.000 sec / 0.000 sec
9	09:38:00	describe shoppingBasketHasBooks	Error Code: 1146. Table 'bookstore.shoppingBasketHasBooks' doesn't exist	0.000 sec
10	09:38:30	describe shoppingBasketHaveBooks	3 row(s) returned	0.000 sec / 0.000 sec

Warehouses_Have_Books Table:

The screenshot shows the MySQL Workbench interface. The query editor contains the command `describe warehouses_have_books;`. The Result Grid pane displays the table structure for `warehouses_have_books`.

Field	Type	Null	Key	Default	Extra
ISBN	varchar(20)	NO	PRI	NULL	
Warehouse_Code	int(11)	NO	PRI	NULL	
Book_Count	int(11)	YES		NULL	

The Output pane shows the execution log for the query. The final result (row 13) shows that the `describe warehouses_have_books` command returned 3 rows successfully.

#	Time	Action	Message	Duration / Fetch
8	09:37:35	describe shopping_basket	2 row(s) returned	0.000 sec / 0.000 sec
9	09:38:00	describe shopping_basket_has_books	Error Code: 1146. Table 'bookstore.shopping_basket_has_books' doesn't exist	0.000 sec
10	09:38:30	describe shopping_basket_have_books	3 row(s) returned	0.000 sec / 0.000 sec
11	09:42:01	describe warehouse_have_books	Error Code: 1146. Table 'bookstore.warehouse_have_books' doesn't exist	0.000 sec
12	09:42:14	describe warehouse_have_books	Error Code: 1146. Table 'bookstore.warehouse_have_books' doesn't exist	0.000 sec
13	09:42:36	describe warehouses_have_books	3 row(s) returned	0.000 sec / 0.000 sec