IN PARTNERSHIP WITH PLYMOUTH UNIVERSITY

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Section 01

Basic Introduction

In our Library Service System there is one main library which contains four different branches based on the popularity of the books available; they are Academic Library, Public Library, School Library and Special Library. In the main library it can register any member but in the branch libraries registration is done according to the age limit and the occupation of the members.

Members are under five categories named Pre-school children, students, undergraduate, postgraduate and others.

There are mainly nine positions in our Library Service System who employees; they are Librarian, Director, Medical Librarian, Media Specialist, Clerk, Assistant, Library Aide and Archivist. For Employee entity there is a multi-valued attribute named qualification. We record the publisher details as well for each book.

Whenever a member borrows a book, we record the issue-date, due-date, and the return-date.

Enhanced entity-relationship (EER) Diagram

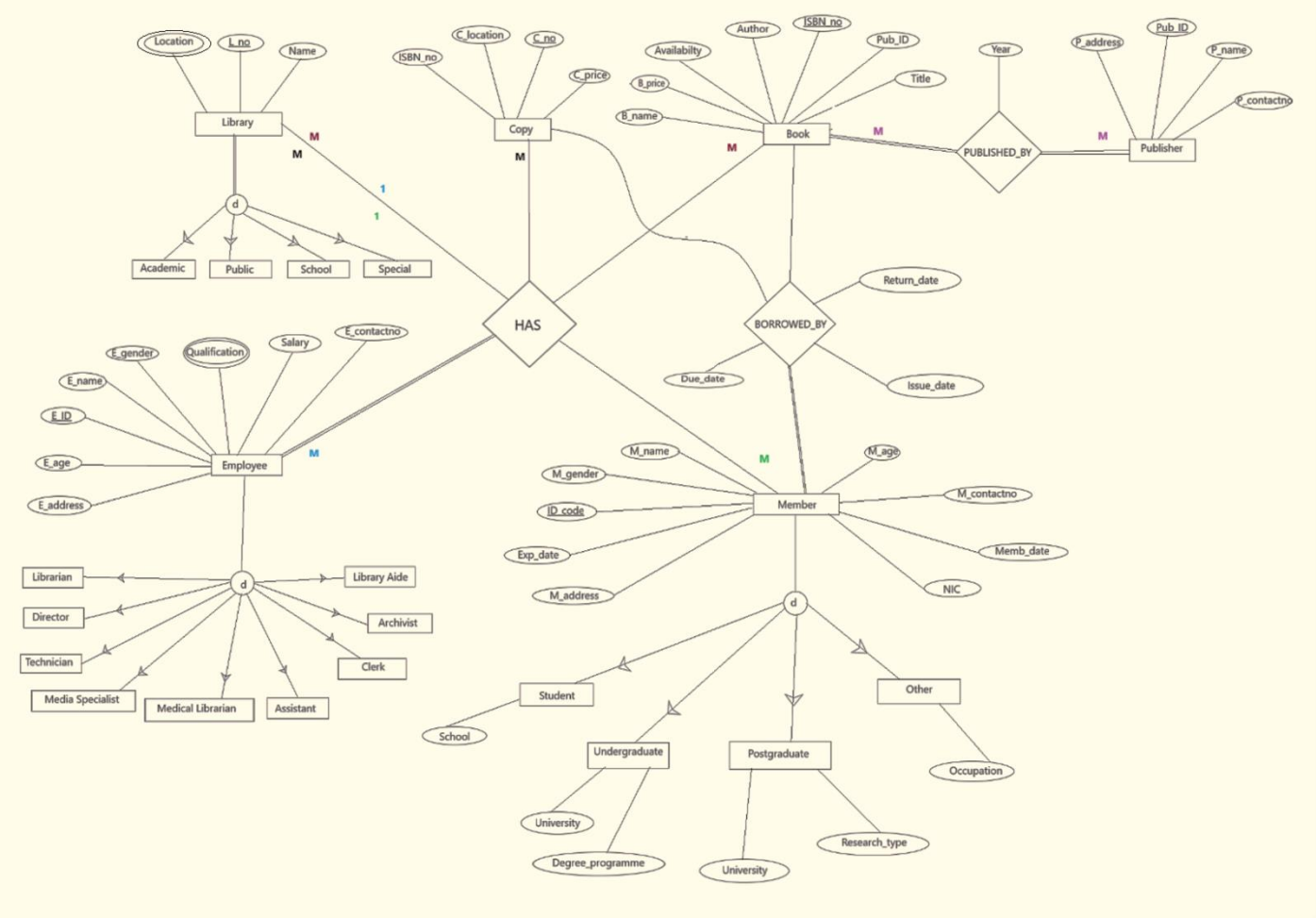


FIGURE 1: ENHANCED ENTITY-RELATIONSHIP DIAGRAM

Assumption

- This library service system has generalized into four branch libraries named as Academic, Public, School and Special.
- ISBN_no in the copy entity is the Foreign Key of the copy entity.
- Pub_ID in the book entity is the Foreign Key of the book entity.
- Qualification attribute under employee entity is a multi-valued attribute. Employees have been generalized into nine positions.
- Location attribute under Library entity is a multi-valued attribute.
- Members have been generalized into four categories named as student, undergraduate, postgraduate and others. As a library service system this is very easy for us to provide what each member needs.

Relational Mapping Diagram

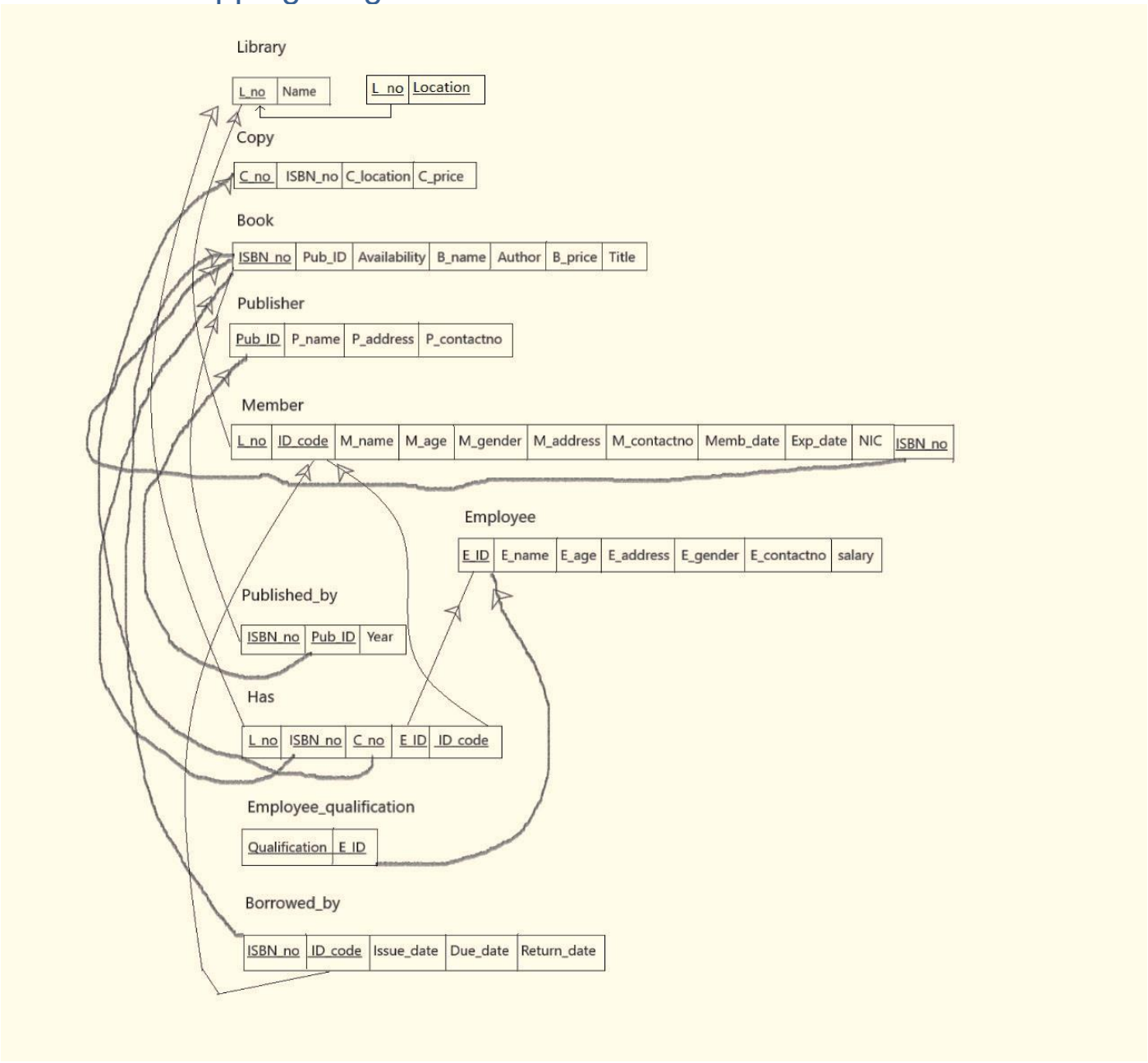


FIGURE 2: RELATIONAL MAPPING DIAGRAM

Normalization

FIGURE 3: NORMALIZATION DIAGRAM

Data Dictionary

Library

P/F	Field Name	Description	Data Type	Field Size
P	L_no	Each library has a unique number E.g., Main Library = 01	Integer	2
	Name	Name of each library	Text	15
	Location	Location of each library and it is multi-valued attribute	Text	20

TABLE 1: LIBRARY

Copy

P/F	Field Name	Description	Data Type	Field Size
P	C_no	Each copy has a unique number	Integer	5
F	ISBN_no	Each book has a unique number	Integer	5
	C_price	Price of each copy	Varchar	

	C_location	Location of each copy	Text	20

TABLE 2: COPY

Book

P/F	Field Name	Description	Data Type	Field Size
P	ISBN_no	Each book has a unique number	Integer	5
F	Pub_ID	Each publisher has a unique ID	Integer	3
	B_name	Name of each book	Text	20
	Author	Author of each book	Text	15
	B_price	Price of each book		
	Title	Title of each book	Text	15
	Availability	Whether the book is available or not	Text	10

TABLE 3: BOOK

Member

P/F	Field Name	Description	Data Type	Field Size
P	ID code	Unique number for each member	Auto number	05
	M_name	Name of each member	Text	20
	M_age	Age of each member	Integer	02
	M_gender	Gender of each member (Male/Female)	Text	05
	M_contactno	Contact number of each member	Integer	10
	M_address	Address of each member	Varchar	20
	Memb_date	Start date of membership		
	Exp_date	Expiry date of membership		
	NIC	National Identity Card number of each member	Integer	10

TABLE 4: MEMBER

Employee

P/F	Field Name	Description	Data Type	Field Size
P	E_ID	Unique ID number for each Employee	Auto Number	05
	E_Name	Name of each Employee	Text	20
	E_age	Age of each Employee	Integer	02
	E_address	Address of each Employee	Varchar	20
	E_gender	Gender of each Employee (Male/Female)	Text	05
	E_Contactno	Contact number of each Employee	Integer	10
	Salary	Salary of each Employee	Float	07
	Qualification	Qualifications of each Employee, this can be multi-valued	Text	30

TABLE 5: EMPLOYEE

Section 02

Creating Table

1. Library

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[library]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[library](
    [lno] [varchar](50) NOT NULL,
    [name] [varchar](50) NOT NULL,
 CONSTRAINT [PK_library] PRIMARY KEY CLUSTERED
(
    [lno] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OF
) ON [PRIMARY]
GO
```

FIGURE 4: LIBRARY (CREATE CODE)

2. Library Location

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[librarylocation]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[librarylocation](
    [lno] [varchar](50) NOT NULL,
    [location] [varchar](100) NOT NULL,
 CONSTRAINT [PK_librarylocation] PRIMARY KEY CLUSTERED
(
    [lno] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OF
) ON [PRIMARY]
GO
ALTER TABLE [dbo].[librarylocation]  WITH CHECK ADD  CONSTRAINT [FK_librarylocation_library] FOREIGN KEY([lno])
REFERENCES [dbo].[library] ([lno])
GO
ALTER TABLE [dbo].[librarylocation] CHECK CONSTRAINT [FK_librarylocation_library]
GO
```

FIGURE 5: LIBRARY LOCATION (CREATE CODE)

3. Academic

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[academic]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[academic](
    [lno] [varchar](50) NOT NULL,
    [school] [varchar](50) NULL,
    [college] [varchar](50) NULL,
    [university] [varchar](50) NULL,
 CONSTRAINT [PK_academic] PRIMARY KEY CLUSTERED
(
    [lno] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OF
) ON [PRIMARY]
GO
ALTER TABLE [dbo].[academic]  WITH CHECK ADD  CONSTRAINT [FK_academic_library] FOREIGN KEY([lno])
REFERENCES [dbo].[library] ([lno])
GO
ALTER TABLE [dbo].[academic] CHECK CONSTRAINT [FK_academic_library]
GO
```

FIGURE 6: LIBRARY ACADEMIC (CREATE CODE)

4. Public

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[public]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[public](
    [lno] [varchar](50) NOT NULL,
    [details] [varchar](50) NULL,
 CONSTRAINT [PK_public] PRIMARY KEY CLUSTERED
(
    [lno] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OF
) ON [PRIMARY]
GO
ALTER TABLE [dbo].[public]  WITH CHECK ADD  CONSTRAINT [FK_public_library] FOREIGN KEY([lno])
REFERENCES [dbo].[library] ([lno])
GO
ALTER TABLE [dbo].[public] CHECK CONSTRAINT [FK_public_library]
GO
```

FIGURE 7: LIBRARY SPECIAL (CREATE CODE)

5. Special

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[special]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[special](
    [lno] [varchar](50) NOT NULL,
    [details] [varchar](50) NULL,
 CONSTRAINT [PK_Table_1] PRIMARY KEY CLUSTERED
(
    [lno] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OF
) ON [PRIMARY]
GO
ALTER TABLE [dbo].[special]  WITH CHECK ADD  CONSTRAINT [FK_special_library] FOREIGN KEY([lno])
REFERENCES [dbo].[library] ([lno])
GO
ALTER TABLE [dbo].[special] CHECK CONSTRAINT [FK_special_library]
GO
```

FIGURE 8: LIBRARY SPECIAL (CREATE CODE)

6. Employee

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[employee]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[employee](
    [empid] [varchar](50) NOT NULL,
    [nic] [char](10) NOT NULL,
    [name] [varchar](50) NULL,
    [gender] [varchar](50) NULL,
    [contactno] [char](10) NULL,
    [salary] [numeric](10, 3) NULL,
    [address] [varchar](100) NULL,
 CONSTRAINT [PK_employee] PRIMARY KEY CLUSTERED
(
    [empid] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OF
) ON [PRIMARY]
GO
```

FIGURE 9: EMPLOYEE (CREATE CODE)

7. Employee Qualification

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[empqualification]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[empqualification](
    [empid] [varchar](50) NOT NULL,
    [qualification] [varchar](50) NULL,
 CONSTRAINT [PK_empqualification] PRIMARY KEY CLUSTERED
(
    [empid] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OF
) ON [PRIMARY]
GO
ALTER TABLE [dbo].[empqualification]  WITH CHECK ADD  CONSTRAINT [FK_empqualification_employee] FOREIGN KEY([empid])
REFERENCES [dbo].[employee] ([empid])
GO
ALTER TABLE [dbo].[empqualification] CHECK CONSTRAINT [FK_empqualification_employee]
GO
```

FIGURE 10: EMPLOYEE QUALIFICATION (CREATE CODE)

8. Librarian

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[librarian]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[librarian](
    [empid] [varchar](50) NOT NULL,
    [details] [varchar](50) NULL,
 CONSTRAINT [PK_libarian] PRIMARY KEY CLUSTERED
(
    [empid] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OF
) ON [PRIMARY]
GO
ALTER TABLE [dbo].[librarian]  WITH CHECK ADD  CONSTRAINT [FK_librarian_employee] FOREIGN KEY([empid])
REFERENCES [dbo].[employee] ([empid])
GO
ALTER TABLE [dbo].[librarian] CHECK CONSTRAINT [FK_librarian_employee]
GO
```

FIGURE 11: EMPLOYEE LIBRARIAN (CREATE CODE)

9. Director

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[director]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[director](
    [empid] [varchar](50) NOT NULL,
    [details] [varchar](50) NULL,
 CONSTRAINT [PK_director] PRIMARY KEY CLUSTERED
(
    [empid] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OF
) ON [PRIMARY]
GO
ALTER TABLE [dbo].[director]  WITH CHECK ADD  CONSTRAINT [FK_director_employee] FOREIGN KEY([empid])
REFERENCES [dbo].[employee] ([empid])
GO
ALTER TABLE [dbo].[director] CHECK CONSTRAINT [FK_director_employee]
GO
```

FIGURE 12: EMPLOYEE DIRECTOR (CREATE CODE)

10. Medical Librarian

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[medicallibrarian]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[medicallibrarian](
    [empid] [varchar](50) NOT NULL,
    [details] [varchar](50) NULL,
 CONSTRAINT [PK_medicallibrarian] PRIMARY KEY CLUSTERED
(
    [empid] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OF
) ON [PRIMARY]
GO
ALTER TABLE [dbo].[medicallibrarian]  WITH CHECK ADD  CONSTRAINT [FK_medicallibrarian_employee] FOREIGN KEY([empid])
REFERENCES [dbo].[employee] ([empid])
GO
ALTER TABLE [dbo].[medicallibrarian] CHECK CONSTRAINT [FK_medicallibrarian_employee]
GO
```

FIGURE 13: EMPLOYEE MEDICAL LIBRARIAN (CREATE CODE)

11. Medical Specialist

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[mediaspecialist]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[mediaspecialist](
    [empid] [varchar](50) NOT NULL,
    [details] [varchar](50) NULL,
 CONSTRAINT [PK_mediaspecialist] PRIMARY KEY CLUSTERED
(
    [empid] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OF
) ON [PRIMARY]
GO
ALTER TABLE [dbo].[mediaspecialist]  WITH CHECK ADD  CONSTRAINT [FK_mediaspecialist_employee] FOREIGN KEY([empid])
REFERENCES [dbo].[employee] ([empid])
GO
ALTER TABLE [dbo].[mediaspecialist] CHECK CONSTRAINT [FK_mediaspecialist_employee]
GO
```

FIGURE 14: EMPLOYEE MEDICAL SPECIALIST (CREATE CODE)

12. Assistant

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[assistant]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[assistant](
    [empid] [varchar](50) NOT NULL,
    [details] [varchar](50) NULL,
 CONSTRAINT [PK_assistant] PRIMARY KEY CLUSTERED
(
    [empid] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OF
) ON [PRIMARY]
GO
ALTER TABLE [dbo].[assistant]  WITH CHECK ADD  CONSTRAINT [FK_assistant_employee] FOREIGN KEY([empid])
REFERENCES [dbo].[employee] ([empid])
GO
ALTER TABLE [dbo].[assistant] CHECK CONSTRAINT [FK_assistant_employee]
GO
```

FIGURE 15: EMPLOYEE ASSISTANT (CREATE CODE)

13. Library Aid

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[libraryaid]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[libraryaid](
    [empid] [varchar](50) NOT NULL,
    [details] [varchar](50) NULL,
 CONSTRAINT [PK_libraryaid] PRIMARY KEY CLUSTERED
(
    [empid] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OF
) ON [PRIMARY]
GO
ALTER TABLE [dbo].[libraryaid]  WITH CHECK ADD  CONSTRAINT [FK_libraryaid_employee] FOREIGN KEY([empid])
REFERENCES [dbo].[employee] ([empid])
GO
ALTER TABLE [dbo].[libraryaid] CHECK CONSTRAINT [FK_libraryaid_employee]
GO
```

FIGURE 16: EMPLOYEE LIBRARY AID (CREATE CODE)

14. Archivists

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[archivists]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[archivists](
    [empid] [varchar](50) NOT NULL,
    [details] [varchar](50) NULL,
 CONSTRAINT [PK_archivists] PRIMARY KEY CLUSTERED
(
    [empid] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OF
) ON [PRIMARY]
GO
ALTER TABLE [dbo].[archivists]  WITH CHECK ADD  CONSTRAINT [FK_archivists_employee] FOREIGN KEY([empid])
REFERENCES [dbo].[employee] ([empid])
GO
ALTER TABLE [dbo].[archivists] CHECK CONSTRAINT [FK_archivists_employee]
GO
```

FIGURE 17: EMPLOYEE ARCHIVISTS (CREATE CODE)

15. Technician

```
USE [LibrarySYS]
GO

/****** Object:  Table [dbo].[technician]    Script Date: 04-Jan-21 11:09:28 AM ******/
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[technician](
    [empid] [varchar](50) NOT NULL,
    [details] [varchar](50) NULL,
 CONSTRAINT [PK_technician] PRIMARY KEY CLUSTERED
(
    [empid] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OFF) ON [PRIMARY]
) ON [PRIMARY]
GO

ALTER TABLE [dbo].[technician]  WITH CHECK ADD  CONSTRAINT [FK_technician_employee] FOREIGN KEY([empid])
REFERENCES [dbo].[employee] ([empid])
GO

ALTER TABLE [dbo].[technician] CHECK CONSTRAINT [FK_technician_employee]
GO
```

FIGURE 18: EMPLOYEE TECHNICIAN (CREATE CODE)

16. Clerk

```
QLQuery2.sql - A...(AZHAR\azhar (51))
USE [LibrarySYS]
GO

/****** Object:  Table [dbo].[clerk]    Script Date: 04-Jan-21 11:10:32 AM ******/
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[clerk](
    [empid] [varchar](50) NOT NULL,
    [details] [varchar](50) NULL,
 CONSTRAINT [PK_clerk] PRIMARY KEY CLUSTERED
(
    [empid] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OFF) ON [PRIMARY]
) ON [PRIMARY]
GO

ALTER TABLE [dbo].[clerk]  WITH CHECK ADD  CONSTRAINT [FK_clerk_employee] FOREIGN KEY([empid])
REFERENCES [dbo].[employee] ([empid])
GO

ALTER TABLE [dbo].[clerk] CHECK CONSTRAINT [FK_clerk_employee]
GO
```

FIGURE 19: EMPLOYEE CLERK (CREATE CODE)

17. Publisher

```sql
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[publisher]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[publisher](
    [publisherid] [varchar](50) NOT NULL,
    [name] [varchar](80) NOT NULL,
    [address] [varchar](100) NULL,
 CONSTRAINT [PK_publisher] PRIMARY KEY CLUSTERED
(
    [publisherid] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OF
) ON [PRIMARY]
GO
```

FIGURE 20: EMPLOYEE PUBLISHER (CREATE CODE)

18. Book

```sql
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[book]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[book](
    [bisbnno] [varchar](50) NOT NULL,
    [name] [varchar](80) NULL,
    [author] [varchar](80) NULL,
    [price] [numeric](5, 3) NULL,
    [title] [nchar](10) NULL,
    [year] [date] NULL,
    [availabilty] [bit] NULL,
    [publisherid] [varchar](50) NULL,
 CONSTRAINT [PK_book] PRIMARY KEY CLUSTERED
(
    [bisbnno] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OFF) ON [PRIMARY]
) ON [PRIMARY]
GO
ALTER TABLE [dbo].[book]  WITH CHECK ADD  CONSTRAINT [FK_book_publisher] FOREIGN KEY([bisbnno])
REFERENCES [dbo].[publisher] ([publisherid])
GO
ALTER TABLE [dbo].[book] CHECK CONSTRAINT [FK_book_publisher]
GO
```

FIGURE 21:BOOK (CREATE CODE)

19. Member

```sql
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[member]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[member](
    [idcode] [varchar](50) NOT NULL,
    [name] [varchar](50) NULL,
    [address] [varchar](50) NULL,
    [gender] [varchar](50) NULL,
    [contactno] [char](10) NULL,
    [expdate] [date] NULL,
    [memberdate] [date] NULL,
 CONSTRAINT [PK_member] PRIMARY KEY CLUSTERED
(
    [idcode] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OFF) ON [PRIMARY]
) ON [PRIMARY]
GO
```

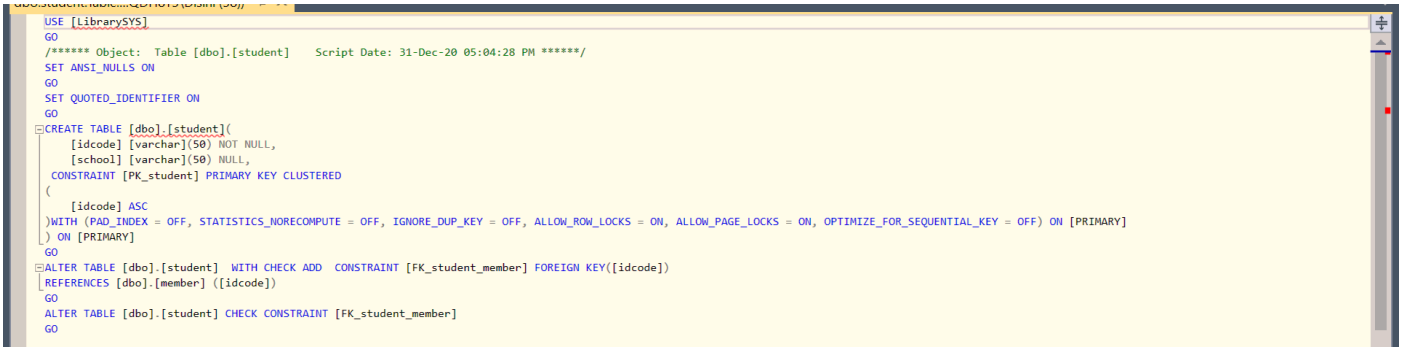
FIGURE 22: MEMBER (CREATE CODE)

20. Kindergarten

```sql
USE [LibrarySYS]
GO

/****** Object:  Table [dbo].[kindergarten]    Script Date: 04-Jan-21 11:13:53 AM ******/
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[kindergarten](
    [idcode] [varchar](50) NOT NULL,
    [name] [varchar](50) NULL,
 CONSTRAINT [PK_kindergarten] PRIMARY KEY CLUSTERED
(
    [idcode] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OFF) ON [PRIMARY]
) ON [PRIMARY]
GO
```

FIGURE 23: MEMBER KINDERGARTEN (CREATE CODE)

21. Student



```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[student]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[student](
    [idcode] [varchar](50) NOT NULL,
    [school] [varchar](50) NULL,
 CONSTRAINT [PK_student] PRIMARY KEY CLUSTERED
(
    [idcode] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OFF) ON [PRIMARY]
) ON [PRIMARY]
GO
ALTER TABLE [dbo].[student]  WITH CHECK ADD  CONSTRAINT [FK_student_member] FOREIGN KEY([idcode])
REFERENCES [dbo].[member] ([idcode])
GO
ALTER TABLE [dbo].[student] CHECK CONSTRAINT [FK_student_member]
GO
```

FIGURE 24: MEMBER STUDENT (CREATE CODE)

22. Undergraduate

```
USE [LibrarySYS]
GO

/****** Object:  Table [dbo].[undergraduate]    Script Date: 04-Jan-21 11:14:37 AM ******/
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[undergraduate](
    [idcode] [varchar](50) NOT NULL,
    [nic] [char](10) NOT NULL,
    [university] [varchar](50) NULL,
    [program] [varchar](50) NULL,
 CONSTRAINT [PK_undergraduate] PRIMARY KEY CLUSTERED
(
    [idcode] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OFF) ON [PRIMARY]
) ON [PRIMARY]
GO

ALTER TABLE [dbo].[undergraduate]  WITH CHECK ADD  CONSTRAINT [FK_undergraduate_member] FOREIGN KEY([idcode])
REFERENCES [dbo].[member] ([idcode])
GO

ALTER TABLE [dbo].[undergraduate] CHECK CONSTRAINT [FK_undergraduate_member]
GO
```

FIGURE 25: MEMBER UNDERGRADUATE (CREATE CODE)

23. Postgraduate

```
USE [LibrarySYS]
GO

/****** Object:  Table [dbo].[postgraduate]    Script Date: 04-Jan-21 11:15:31 AM ******/
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[postgraduate](
    [idcode] [varchar](50) NOT NULL,
    [nic] [char](10) NOT NULL,
    [university] [varchar](50) NULL,
    [researchtype] [varchar](50) NULL,
 CONSTRAINT [PK_postgraduate] PRIMARY KEY CLUSTERED
(
    [idcode] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OFF) ON [PRIMARY]
) ON [PRIMARY]
GO

ALTER TABLE [dbo].[postgraduate]  WITH CHECK ADD  CONSTRAINT [FK_postgraduate_member] FOREIGN KEY([idcode])
REFERENCES [dbo].[member] ([idcode])
GO

ALTER TABLE [dbo].[postgraduate] CHECK CONSTRAINT [FK_postgraduate_member]
GO
```

FIGURE 26: MEMBER POSTGRADUATE (CREATE CODE)

24. Other

```
USE [LibrarySYS]
GO

/****** Object:  Table [dbo].[other]    Script Date: 04-Jan-21 11:16:09 AM ******/
SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

CREATE TABLE [dbo].[other](
    [idcode] [varchar](50) NOT NULL,
    [nic] [char](10) NOT NULL,
    [occupation] [varchar](50) NULL,
 CONSTRAINT [PK_other] PRIMARY KEY CLUSTERED
(
    [idcode] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OFF) ON [PRIMARY]
) ON [PRIMARY]
GO

ALTER TABLE [dbo].[other]  WITH CHECK ADD  CONSTRAINT [FK_other_member] FOREIGN KEY([idcode])
REFERENCES [dbo].[member] ([idcode])
GO

ALTER TABLE [dbo].[other] CHECK CONSTRAINT [FK_other_member]
GO
```

FIGURE 27: MEMBER OTHER (CREATE CODE)

25. Copy

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[copy]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[copy](
    [cno] [varchar](50) NOT NULL,
    [cisbnno] [varchar](50) NULL,
    [price] [numeric](10, 3) NULL,
 CONSTRAINT [PK_copy] PRIMARY KEY CLUSTERED
(
    [cno] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OFF) ON [PRIMARY]
) ON [PRIMARY]
GO
```

FIGURE 28: COPY (CREATE CODE)

26. Copy Location

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[copylocation]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[copylocation](
    [cno] [varchar](50) NOT NULL,
    [location] [varchar](100) NULL,
 CONSTRAINT [PK_copylocation] PRIMARY KEY CLUSTERED
(
    [cno] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OFF) ON [PRIMARY]
) ON [PRIMARY]
GO
ALTER TABLE [dbo].[copylocation]  WITH CHECK ADD  CONSTRAINT [FK_copylocation_copy] FOREIGN KEY([cno])
REFERENCES [dbo].[copy] ([cno])
GO
ALTER TABLE [dbo].[copylocation] CHECK CONSTRAINT [FK_copylocation_copy]
GO
```

FIGURE 29: COPY LOCATION (CREATE CODE)

27. Has Relationship

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[has]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[has](
    [lno] [varchar](50) NOT NULL,
    [empid] [varchar](50) NOT NULL,
    [cno] [varchar](50) NOT NULL,
    [bisbnno] [varchar](50) NOT NULL,
 CONSTRAINT [PK_has] PRIMARY KEY CLUSTERED
(
    [lno] ASC,
    [empid] ASC,
    [cno] ASC,
    [bisbnno] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OFF) ON [PRIMARY]
) ON [PRIMARY]
GO
ALTER TABLE [dbo].[has]  WITH CHECK ADD  CONSTRAINT [FK_has_has] FOREIGN KEY([lno], [empid], [cno], [bisbnno])
REFERENCES [dbo].[has] ([lno], [empid], [cno], [bisbnno])
GO
ALTER TABLE [dbo].[has] CHECK CONSTRAINT [FK_has_has]
GO
```

FIGURE 30: HAS RELATIONSHIP (CREATE CODE)

28. Borrow relationship

```
USE [LibrarySYS]
GO
/****** Object:  Table [dbo].[borrow\]    Script Date: 31-Dec-20 05:04:28 PM ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[borrow\](
    [cisbnno] [varchar](50) NOT NULL,
    [bisbnno] [varchar](50) NOT NULL,
    [cno] [varchar](50) NOT NULL,
    [idcode] [varchar](50) NOT NULL,
    [returndate] [date] NULL,
    [duedate] [date] NULL,
    [issuedate] [date] NULL,
 CONSTRAINT [PK_borrow\] PRIMARY KEY CLUSTERED
(
    [cisbnno] ASC,
    [bisbnno] ASC,
    [cno] ASC,
    [idcode] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, OPTIMIZE_FOR_SEQUENTIAL_KEY = OFF) ON [PRIMARY]
) ON [PRIMARY]
GO
```

FIGURE 31: BORROW RELATIONSHIP (CREATE CODE)

Database Diagram

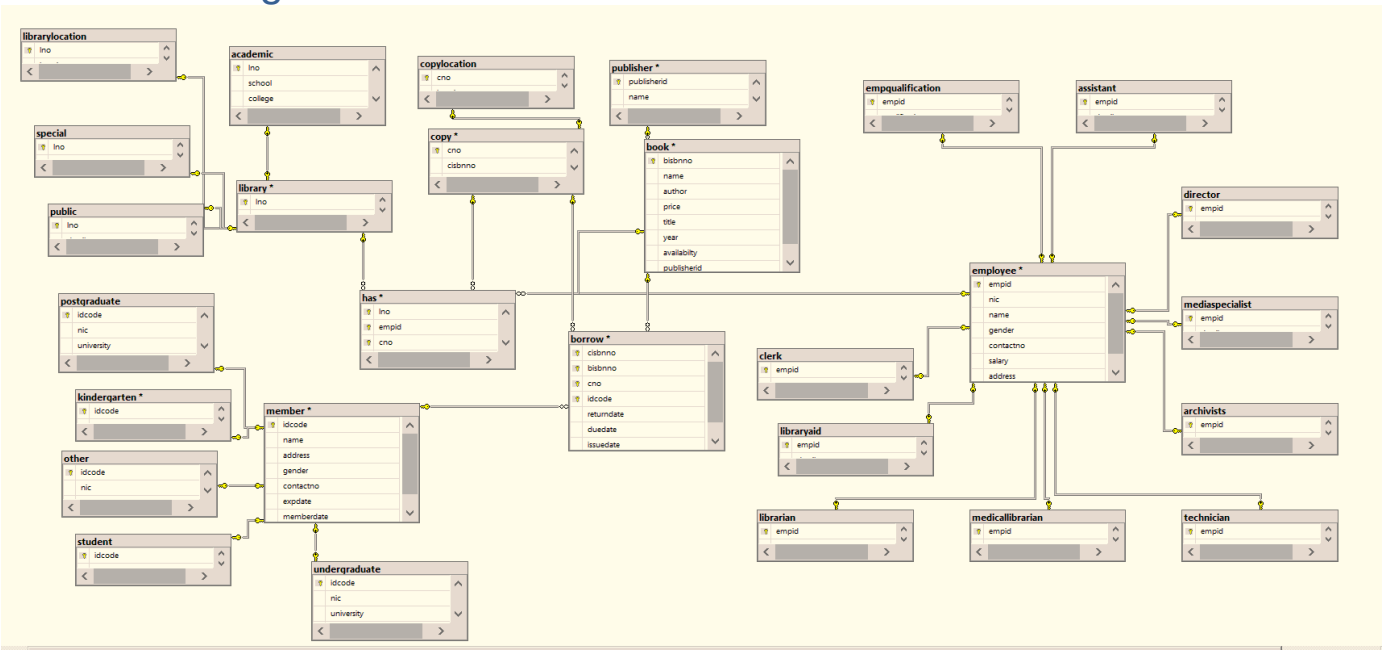


FIGURE 32: DATABASE DIAGRAM

Section 03

View

1. View

```
SET QUOTED_IDENTIFIER ON
GO

DROP VIEW [dbo].[boolpublisherview]

CREATE VIEW [dbo].[boolpublisherview]
AS
SELECT dbo.book.bisbnno AS bid, dbo.book.title AS btitle, dbo.book.price AS bprice, dbo.book.publisherid AS pid, dbo.publisher.address AS paddress, dbo.book.availabilty AS bavailabity
FROM     dbo.book INNER JOIN
                  dbo.publisher ON dbo.book.publisherid = dbo.publisher.publisherid
WHERE   dbo.book.availabilty='True'
GO

SELECT * FROM [dbo].[boolpublisherview]

EXEC sys.sp_addextendedproperty @name=N'MS_DiagramPane1', @value=N'[0E232FF0-B466-11cf-A24F-00AA00A3EFFF, 1.00]
Begin DesignProperties =
   Begin PaneConfigurations =
      Begin PaneConfiguration = 0
         NumPanes = 4
         Configuration = "(H (1[24] 4[24] 2[10] 3) )"
      End
```

Results | Messages

	bid	btitle	bprice	pid	paddress	bavailabity
1	100214	Just Me	1750	301	12 Sam street florida	1
2	105679	In Search Of lost Time	3000	304	126 Stuart Road, Highlevel	1
3	234686	Ulysses	4000	305	45 North carolina	1
4	451900	War and Peace	2000	308	345,vermont	1

FIGURE 33: VIEW

2. View

```
DROP VIEW [dbo].[copyandlocationview2]

CREATE VIEW [dbo].[copyandlocationview2]
AS
SELECT TOP (100) PERCENT dbo.copy.cno AS no, dbo.copy.cisbnno AS isbn, dbo.copy.price, dbo.copylocation.location
FROM     dbo.copy INNER JOIN
                  dbo.copylocation ON dbo.copy.cno = dbo.copylocation.cno
WHERE dbo.copy.price<10000
ORDER BY dbo.copy.price
GO

SELECT * FROM [dbo].[copyandlocationview2]

EXEC sys.sp_addextendedproperty @name=N'MS_DiagramPane1', @value=N'[0E232FF0-B466-11cf-A24F-00AA00A3EFFF, 1.00]
Begin DesignProperties =
   Begin PaneConfigurations =
```

110 %

Results | Messages

	no	isbn	price	location
1	20001	40001	8000.000	Homagama
2	20002	40002	5000.000	Colombo
3	20005	40005	9000.000	Kandy
4	20007	40007	2000.000	Hatton
5	20008	40008	1900.000	Katunayke
6	20010	40010	1000.000	Kandy

FIGURE 34: 2ND VIEW

Trigger

1. Trigger

```
create trigger triggerpublisherdelete_InsteadOfDelete
on publisher
instead of delete
as
Begin
    Delete book
    From book
    join  deleted
    on book.publisherid=deleted.publisherid
End
```

100 %

Results | Messages

	publisherid	name	address
1	300	Stark	312 North California
2	301	Clara	12 Sam street florida
3	302	Delora	38 Family Junction Pensilvania
4	303	Emilia	234 Jaffna Road, Jaffna
5	304	Madea	126 Stuart Road, Highlevel
6	305	Florence	45 North carolina
7	306	Redma	456 tranver street Matale
8	307	Tresha	56, red meat shop street
9	308	Payton	345,vermont
10	309	Darwin	34 elmore street
11	456	Azar	NULL

	bisbnno	name	author	price	title	year	availabilty	publisherid
1	100214	Just Me	Jojo Moyes	1750	Just Me	2018-01-01	1	301
2	100234	To Kill a mockingbird	Harper Lee	2300	To Kill a mockingbird	2011-01-01	0	300
3	100562	Lord of the rings	J.R.R.Tolkein	2500	Lord of the rings	2005-01-01	0	302
4	100764	Pinnochio	Carlo Collodi	2000	Pinnochio	1885-01-01	0	303
5	105679	In Search of lost Time	Marcel Proust	3000	In Search Of lost Time	2006-01-01	1	304
6	234576	Hamlet	William Shakespeare	1500	Hamlet	1996-01-01	0	309
7	234686	Ulysses	James Joyce	4000	Ulysses	1995-01-01	1	305
8	451900	War and Peace	Leo Tolstoy	2000	War and Peace	2001-01-01	1	308
9	456789	Moby Dick	Herman Melville	3000	Moby Dick	2015-01-01	0	307
10	456798	The Great Gatsby	Scott Fitzgerald	4500	The Great Gatsby	2019-01-01	0	306

FIGURE 35: 1ST TRIGGER

2. Trigger

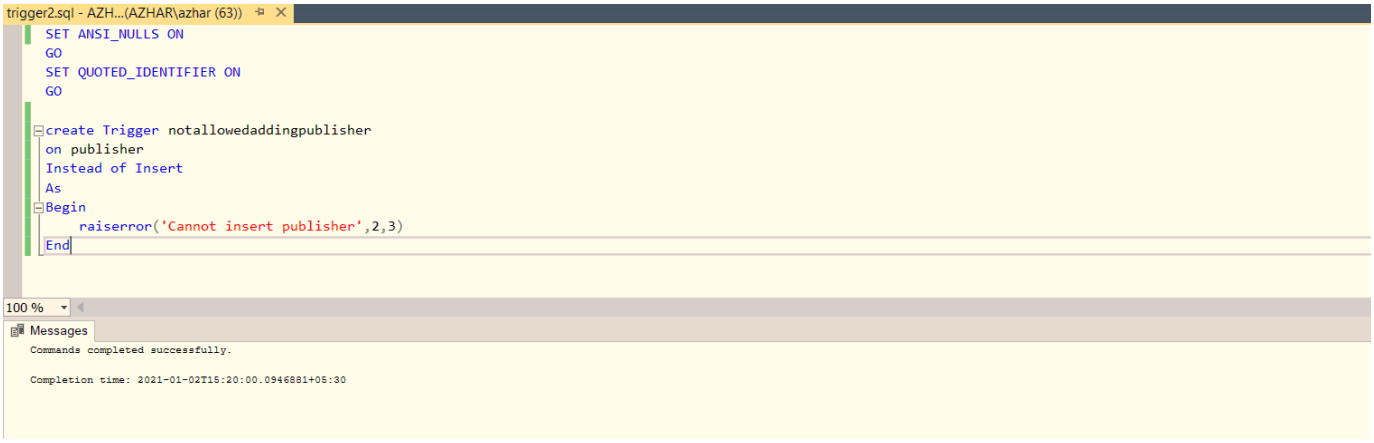


FIGURE 36: 2ND TRIGGER CREATE CODE

FIGURE 37: 2ND TRIGGER INSERTION

	publisherid	name	address
1	300	Stark	312 North California
2	301	Clara	12 Sam street florida
3	302	Delora	38 Family Junction Pensilvania
4	303	Emilia	234 Jaffna Road, Jaffna
5	304	Madea	126 Stuart Road, Highlevel
6	305	Florence	45 North carolina
7	306	Redma	456 tranver street Matale
8	307	Tresha	56, red meat shop street
9	308	Payton	345,vermont
10	309	Darwin	34 elmore street
11	456	Azar	NULL

FIGURE 38: 2ND TRIGGER EXECUTION

Function

1. Function

```
GO

CREATE FUNCTION bookdetail(@bisbnno varchar(50))
    RETURNS @book TABLE
        (author varchar(80),year date,price varchar(50))
AS
BEGIN
    INSERT INTO @book
    SELECT author, year, price
    FROM  book
    WHERE bisbnno=@bisbnno
    RETURN
END

select * from book

select * from bookdetail(456798)
```

110 %

Messages

```
Commands completed successfully.

Completion time: 2021-01-02T16:34:20.1374821+05:30
```

FIGURE 39: 1ST FUNCTION CREATION

```
GO

CREATE FUNCTION bookdetail(@bisbnno varchar(50))
    RETURNS @book TABLE
        (author varchar(80),year date,price varchar(50))
AS
BEGIN
    INSERT INTO @book
    SELECT author, year, price
    FROM  book
    WHERE bisbnno=@bisbnno
    RETURN
END

select * from book

select * from bookdetail(456798)
```

110 %

Results | Messages

	bisbnno	name	author	price	title	year	availabilty	publisherid
1	100214	Just Me	Jojo Moyes	1750	Just Me	2018-01-01	1	301
2	100234	To Kill a mockingbird	Harper Lee	2300	To Kill a mockingbird	2011-01-01	0	300
3	100562	Lord of the rings	J.R.R.Tolkein	2500	Lord of the rings	2005-01-01	0	302
4	100764	Pinnochio	Carlo Collodi	2000	Pinnochio	1885-01-01	0	303
5	105679	In Search of lost Time	Marcel Proust	3000	In Search Of lost Time	2006-01-01	1	304
6	234576	Hamlet	William Shakespeare	1500	Hamlet	1996-01-01	0	309
7	234686	Ulysses	James Joyce	4000	Ulysses	1995-01-01	1	305
8	451900	War and Peace	Leo Tolstoy	2000	War and Peace	2001-01-01	1	308
9	456789	Moby Dick	Herman Melville	3000	Moby Dick	2015-01-01	0	307
10	456798	The Great Gatsby	Scott Fitzgerald	4500	The Great Gatsby	2019-01-01	0	306

FIGURE 40: 1ST FUNCTION EXECUTION

2. Function

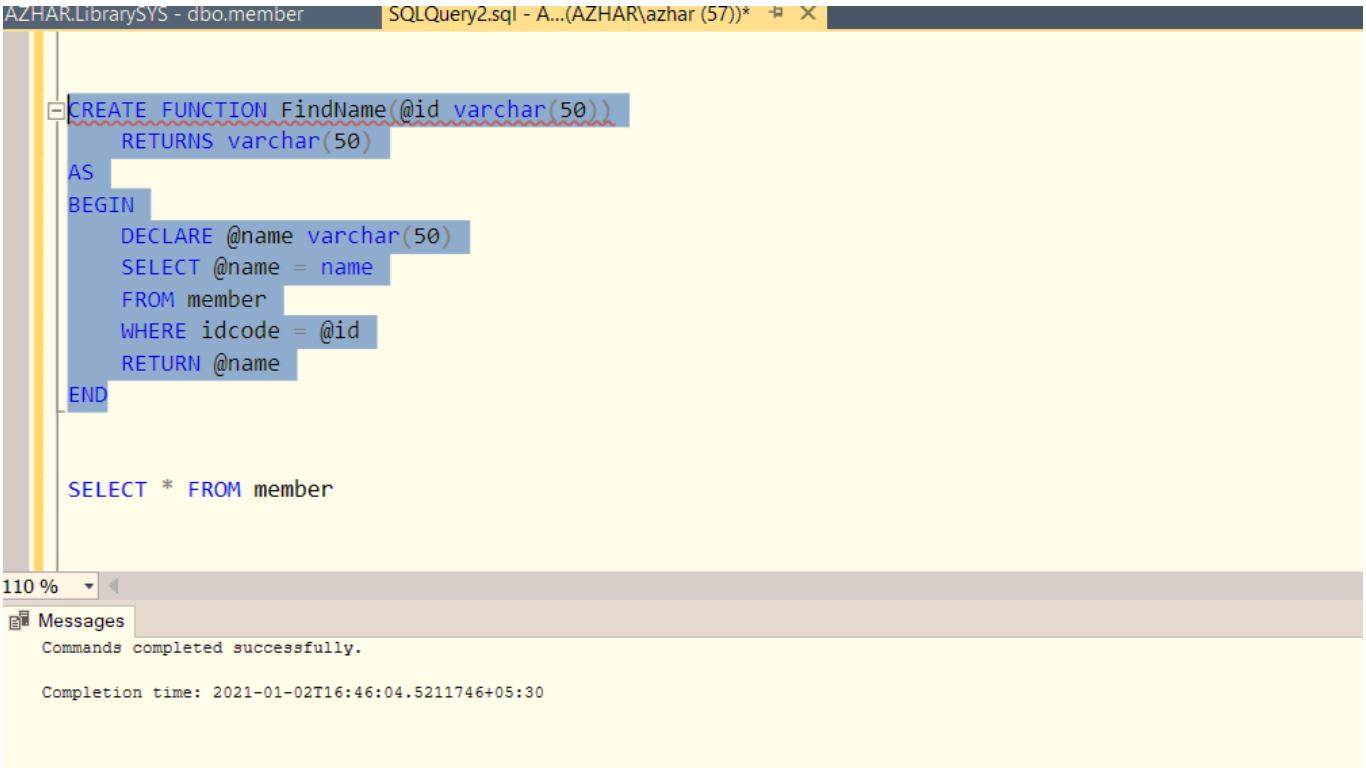


FIGURE 41: 2ND FUNCTION (CREATE CODE)

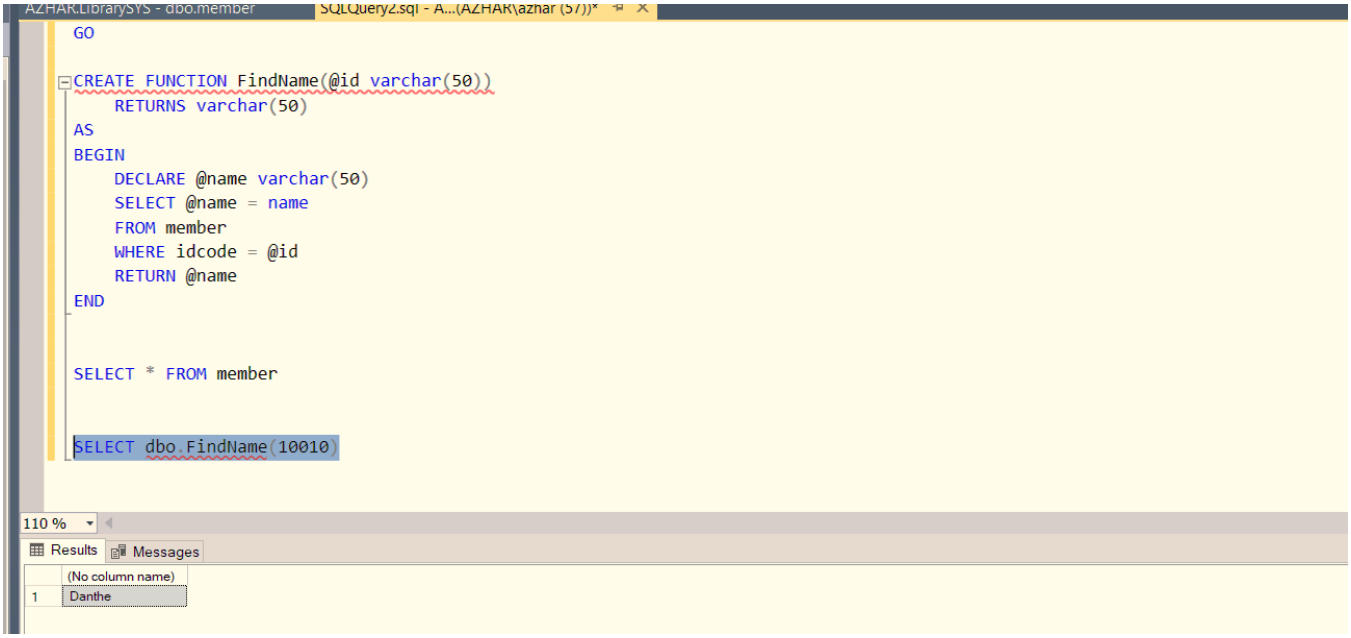


FIGURE 42: 2ND FUNCTION (EXECUTION)

```
CREATE FUNCTION FindName(@id varchar(50))
    RETURNS varchar(50)
AS
BEGIN
    DECLARE @name varchar(50)
    SELECT @name = name
    FROM member
    WHERE idcode = @id
    RETURN @name
END

SELECT * FROM member

SELECT * FROM FindName()
```

110 %

Results | Messages

	idcode	name	address	gender	contactno	expdate	memberdate
1	10001	Ariana	Colombo	Female	0777456790	2020-12-31	2020-09-18
2	10002	Dilan	Wattale	Male	0768926715	2020-12-30	2019-08-26
3	10003	Ajith	Kandy	Male	0777451826	2020-12-31	2018-02-25
4	10004	Disney	Homagama	Female	0712635981	2020-12-31	2020-06-02
5	10005	Sheila	Colombo	Female	0712635541	2020-12-21	2020-04-06
6	10006	Malindu	Maharagama	Male	0712632331	2020-12-31	2018-06-03
7	10007	Shamima	Colombo	Female	0777259810	2020-12-23	2020-03-06
8	10008	Liza	Awisawalla	Female	0715278810	2020-12-11	2018-08-12
9	10009	Donald	Colombo	Male	0642195981	2020-12-31	2019-01-06
10	10010	Danthe	Wattale	Female	0777787610	2020-12-01	2019-01-29

FIGURE 43: 2ND FUNCTION (SELECTION CODE)

Procedure

1. Procedure

```
GO


CREATE PROCEDURE findavailabilitycount @avail bit
AS
BEGIN
    DECLARE @availcount int
    SELECT @availcount = COUNT(*)
    FROM book
    WHERE availabilty = @avail
    RETURN  @availcount
END

DECLARE @countbook varchar(50)
EXEC @countbook = findbookcount 100214
SELECT @countbook
```

10 %

Messages

```
Commands completed successfully.

Completion time: 2021-01-03T06:17:36.2362036+05:30
```

FIGURE 44: 1ST PROCEDURE (CREATE)

```
GO


CREATE PROCEDURE findavailabilitycount @avail bit
AS
BEGIN
    DECLARE @availcount int
    SELECT @availcount = COUNT(*)
    FROM book
    WHERE availabilty = @avail
    RETURN  @availcount
END

DECLARE @countavail varchar(50)
EXEC @countavail = findavailabilitycount 1
SELECT @countavail
```

110 %

Results | Messages

	(No column name)
1	4

FIGURE 45: 1ST PROCEDURE (EXECUTION)

2. Procedure

AZHAR.LibrarySYS - dbo.book | SQLQuery3.sql - A...(AZHAR\azhar (55))* | SQLQuery2.sql - A...(AZHAR\azhar (54))

```
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO


create procedure findbook @avail bit, @author varchar (80)
as
select name, author, price from book where
[availabilty] = @avail and
[author] = @author

exec findbook @avail= ,@author = ''
```

110 %

Messages

```
Commands completed successfully.

Completion time: 2021-01-03T06:31:08.6023963+05:30
```

FIGURE 46: 1ST PROCEDURE (CREATE)

AZHAR.LibrarySYS - dbo.book | SQLQuery3.sql - A...(AZHAR\azhar (55))* | SQLQuery2.sql - A...(AZHAR\azhar (54))

```
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO


create procedure findbook @avail bit, @author varchar (80)
as
select name, author, price from book where
[availabilty] = @avail and
[author] = @author

exec findbook @avail=1 ,@author = 'Jojo Moyes'
```

110 %

Results | Messages

	name	author	price
1	Just Me	Jojo Moyes	1750

FIGURE 47: 2ND PROCEDURE

Section 04

Worthy features

A worthy feature in our Library Service System is that we have broken down members into further categories like kindergarten kids, undergraduates, postgraduates, students, etc. this makes it easier for the member during application.

Together with any shortcomings

There were many issues with how to do the tables and how to do them properly and there were some issues with the triggers.

How they might be resolved

We watched and researched in many websites and YouTube, and then we made many mistakes but, in the end, we got it right

Future Implementation

Sri Lankan public libraries still track books by hand, where they use a card system. This can be exhausting and slow. These libraries can benefit from this application if they implement it. They will save time, increase efficiency, and have less paperwork.

Screenshots of everything remaining

1. Library

```
use LibrarySYS

INSERT INTO library (lno, name)
VALUES('001','Peradeniya Library'),
('002','Colombo Public Library'),
('003','Lyceum Wattala Library'),
('004','Royal College Library'),
('005','NSBM GREEN UNIVERSITY Library'),
('006','Atomic Energy Authority Library'),
('007','National Library of Sri Lanka'),
('008','School Library Maharagama'),
('009','Central College Library'),
('010','SLIIT Library')
SELECT * FROM library
```

100 %

Results | Messages

	lno	name
1	001	Peradeniya Library
2	002	Colombo Public Library
3	003	Lyceum Wattala Library
4	004	Royal College Library
5	005	NSBM GREEN UNIVERSITY Library
6	006	Atomic Energy Authority Library
7	007	National Library of Sri Lanka
8	008	School Library Maharagama
9	009	Central College Library
10	010	SLIIT Library

FIGURE 48: LIBRARY (VALUE INSERTION)

2. Library Location

SQLQuery26.sql -...(AZHAR\azhar (58))*

```
INSERT INTO librarylocation (lno, location)
VALUES('001','Peradeniya'),
('002','Colombo'),
('003','Wattale'),
('004','Colombo'),
('005','Homagama'),
('006','Colombo'),
('007','Colombo'),
('008','Maharagama'),
('009','KattanKudy'),
('010','Malabe')
SELECT * FROM librarylocation
GO
```

100 %

Results | Messages

	lno	location
1	001	Peradeniya
2	002	Colombo
3	003	Wattale
4	004	Colombo
5	005	Homagama
6	006	Colombo
7	007	Colombo
8	008	Maharagama
9	009	KattanKudy
10	010	Malabe

FIGURE 49: LIBRARY LOCATION (VALUE INSERTION)

3. Academic

```
SELECT * FROM librarylocation
GO

INSERT INTO academic (lno, school, college, university)
VALUES ('003','Lyceum Wattala','',''),
('004','','Royal College',''),
('005','','','NSBM GREEN UNIVERSITY'),
('008','School Library Maharagama','',''),
('009','','Central College Library',''),
('010','','','SLIIT Library')
SELECT * FROM academic
GO

INSERT INTO [public](lno, details)
```

100 %

Results | Messages

	lno	school	college	university
1	003	Lyceum Wattala		
2	004		Royal College	
3	005			NSBM GREEN UNIVERSITY
4	008	School Library Maharagama		
5	009		Central College Library	
6	010			SLIIT Library

FIGURE 50: LIBRARY ACADEMIC (VALUE INSERTION)

4. Public

```
('005','','','NSBM GREEN UNIVERSITY'),
('008','School Library Maharagama','',''),
('009','','Central College Library',''),
('010','','','SLIIT Library')
SELECT * FROM academic
GO

INSERT INTO [public](lno, details)
VALUES('002','Colombo Public Library details'),
('007','National Library of Sri Lanka details')
SELECT * FROM [public]
GO

INSERT INTO special(lno, details)
```

100 %

Results | Messages

	lno	details
1	002	Colombo Public Library details
2	007	National Library of Sri Lanka details

FIGURE 51: LIBRARY PUBLIC (VALUE INSERTION)

5. Special

```
SQLQuery26.sql -...(AZHAR\azhar (58))*

INSERT INTO [public](lno, details)
VALUES('002','Colombo Public Library details'),
('007','National Library of Sri Lanka details')
SELECT * FROM [public]
GO

INSERT INTO special(lno, details)
VALUES('001','Peradeniya Library details'),
('006','Atomic Energy Authority details')
SELECT * FROM special
GO
```

100 %

Results | Messages

	lno	details
1	001	Peradeniya Library details
2	006	Atomic Energy Authority details

FIGURE 52: LIBRARY SPECIAL (VALUE INSERTION)

6. Employee

```
INSERT INTO employee(empid,nic,name,gender,contactno,salary,address)
VALUES ('100','2003503100','Jack','Male','0777515786','75000','89,Kuswala Raddolugama'),
('101','2003504123','Emily','Female','0777231623','75000','32,Katunayke'),
('102','1992321231','Dilishi','Female','0715432712','50000','19 B,Ampara'),
('103','2001231227','Felix','Male','0760543212','67000','234 Trincomolee'),
('104','2000256781','Larry','Male','0765316790','80000','128 Matale'),
('105','1999235421','Sammy','Female','0735614289','50000','!90 Wattala Junction'),
('106','1880376514','Jimmy','Male','0716254318','45000','293 Jaffna'),
('107','1990263567','Timmothy','Male','0777651490','60000','124 strawberry lane Nuweraeliya'),
('108','2002256719','Anthonia','Female','0751367819','70000','130, Devala road Kandy'),
('109','2091267751','Jeffery','Male','0776540198','75000','124, Rubber road Katunayke')
SELECT * FROM employee
GO
```

100 %

Results | Messages

	empid	nic	name	gender	contactno	salary	address
1	100	2003503100	Jack	Male	0777515786	75000.000	89,Kuswala Raddolugama
2	101	2003504123	Emily	Female	0777231623	75000.000	32,Katunayke
3	102	1992321231	Dilishi	Female	0715432712	50000.000	19 B,Ampara
4	103	2001231227	Felix	Male	0760543212	67000.000	234 Trincomolee
5	104	2000256781	Larry	Male	0765316790	80000.000	128 Matale
6	105	1999235421	Sammy	Female	0735614289	50000.000	!90 Wattala Junction
7	106	1880376514	Jimmy	Male	0716254318	45000.000	293 Jaffna
8	107	1990263567	Timmothy	Male	0777651490	60000.000	124 strawberry lane Nuweraeliya
9	108	2002256719	Anthonia	Female	0751367819	70000.000	130, Devala road Kandy
10	109	2091267751	Jeffery	Male	0776540198	75000.000	124, Rubber road Katunayke

FIGURE 53: EMPLOYEE (VALUE INSERTION)

7. Employee Qualification

AZHAR.LibrarySYS -...o.empqualification | SQLQuery35.sql -...(AZHAR\azhar (68))* | SQLQuery32.sql -...(AZHAR\azhar (58))*

```
SELECT * FROM employee
GO


INSERT INTO empqualification(empid,qualification)
VALUES('100','Majors in Cyber Law'),
('101','Majors in Software Engineering'),
('102','Studied in NSBM and did my degree on Business Managment'),
('103','Business Management'),
('104','Civil Engineering'),
('105','Quantity Serveying'),
('106','Electrical and Electronic Engineering'),
('107','Automobile'),
('108','Agriculture'),
('109','System Analyst')
SELECT * FROM empqualification


INSERT INTO librarian(empid, details)
```

100 %

Results | Messages

	empid	qualification
1	100	Majors in Cyber Law
2	101	Majors in Software Engineering
3	102	Studied in NSBM and did my degree on Business Ma...
4	103	Business Management
5	104	Civil Engineering
6	105	Quantity Serveying
7	106	Electrical and Electronic Engineering
8	107	Automobile
9	108	Agriculture
10	109	System Analyst

FIGURE 54: EMPLOYEE QUALIFICATION (VALUE INSERTION)

8. Librarian

```
use LibrarySYS

INSERT INTO library (lno, name)
VALUES('001','Peradeniya Library'),
('002','Colombo Public Library'),
('003','Lyceum Wattala Library'),
('004','Royal College Library'),
('005','NSBM GREEN UNIVERSITY Library'),
('006','Atomic Energy Authority Library'),
('007','National Library of Sri Lanka'),
('008','School Library Maharagama'),
('009','Central College Library'),
('010','SLIIT Library')
SELECT * FROM library
```

100 %

Results | Messages

	lno	name
1	001	Peradeniya Library
2	002	Colombo Public Library
3	003	Lyceum Wattala Library
4	004	Royal College Library
5	005	NSBM GREEN UNIVERSITY Library
6	006	Atomic Energy Authority Library
7	007	National Library of Sri Lanka
8	008	School Library Maharagama
9	009	Central College Library
10	010	SLIIT Library

FIGURE 55: EMPLOYEE LIBRARIAN (VALUE INSERTION)

9. Director

AZHAR.LibrarySYS -...o.empqualification | SQLQuery35.sql -...(AZHAR\azhar (68))* | SQLQuery32.sql -...(AZHAR\azhar (58))*

```
values('100',''),
('103','')
select * from librarian


INSERT INTO director(empid, details)
values('101',''),
('105','')
select * from director
```

100 %

Results | Messages

	empid	details
1	101	
2	105	

FIGURE 56: EMPLOYEE DIRECTOR (VALUE INSERTION)

10. Medical Librarian

AZHAR.LibrarySYS -...o.empqualification | SQLQuery35.sql -...(AZHAR\azhar (68))* | SQLQuery32.sql -...(AZHAR\azhar (58))*

```
select * from director


INSERT INTO medicallibrarian(empid, details)
values('102','')
select * from medicallibrarian


INSERT INTO mediaspecialist(empid, details)
values('104',''),
('107','')
```

100 %

Results | Messages

	empid	details
1	102	

FIGURE 57: EMPLOYEE MEDICAL LIBRARIAN (VALUE INSERTION)

11. Media Specialist

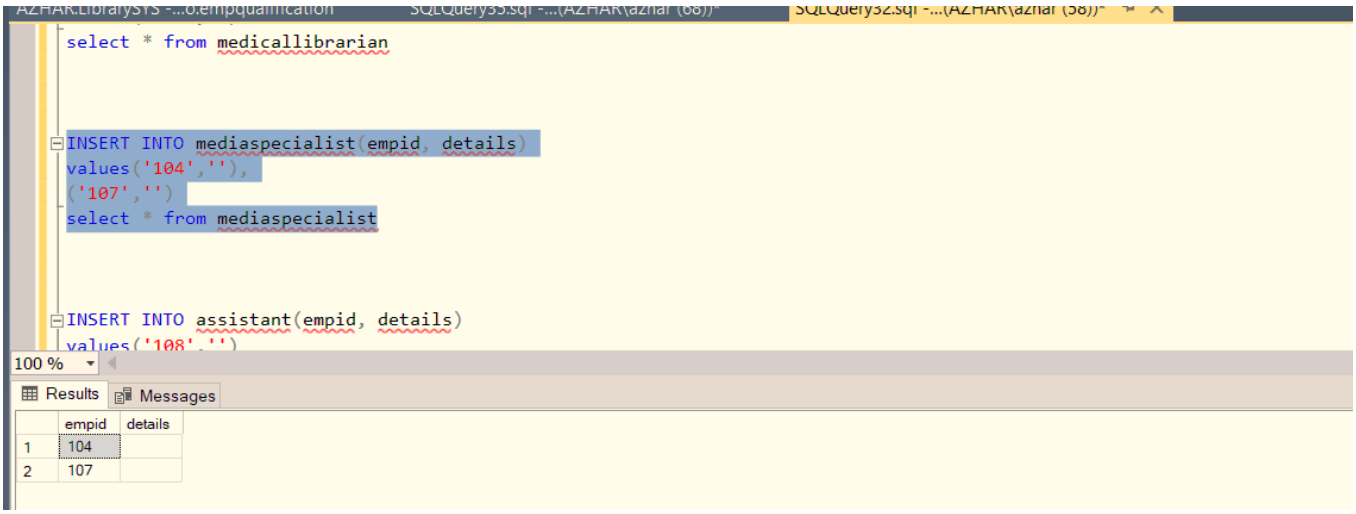


FIGURE 58: EMPLOYEE MEDIA SPECIALIST (VALUE INSERTION)

12. Assistant

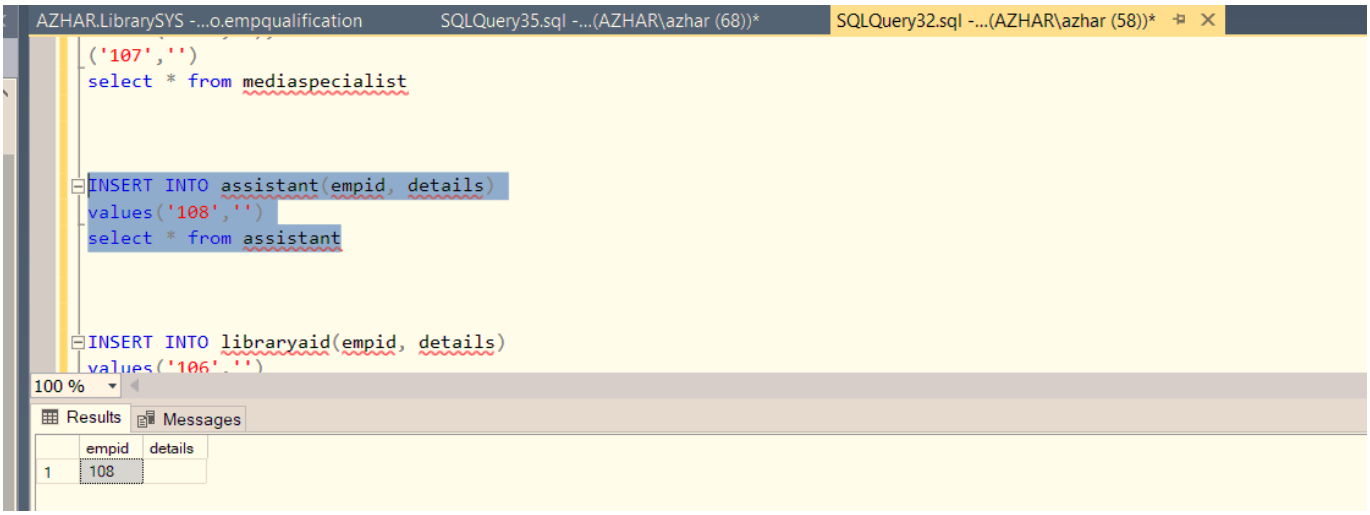


FIGURE 59: EMPLOYEE ASSISTANT (VALUE INSERTION)

13. Library Aid

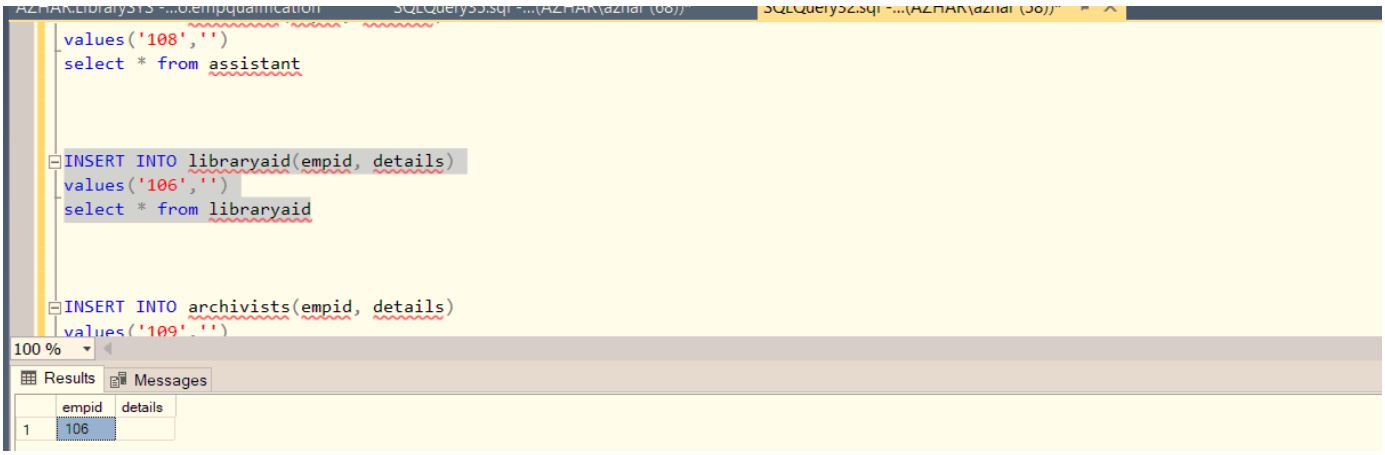


FIGURE 60: EMPLOYEE LIBRARY AID (VALUE INSERTION)

14. Archivist

```
INSERT INTO archivists(empid, details)
values('109','')
select * from archivists
```

100 %

Results | Messages

	empid	details
1	109	

FIGURE 61: EMPLOYEE ARCHIVISTS (VALUE INSERTION)

15. Publisher

```
use LibrarySYS

insert into [publisher] (name,address,publisherid)
values('Stark','312 North California','300'),
('Clara','12 Sam street florida','301'),
('Delora','38 Family Junction Pensilvania','302'),
('Emilia','234 Jaffna Road, Jaffna','303'),
('Madea','126 Stuart Road, Highlevel','304'),
('Florence','45 North carolina','305'),
('Redma','456 tranver street Matale','306'),
('Tresha','56, red meat shop street','307'),
('Payton','345,vermont','308'),
('Darwin','34 elmore street','309');
select * from [publisher]
```

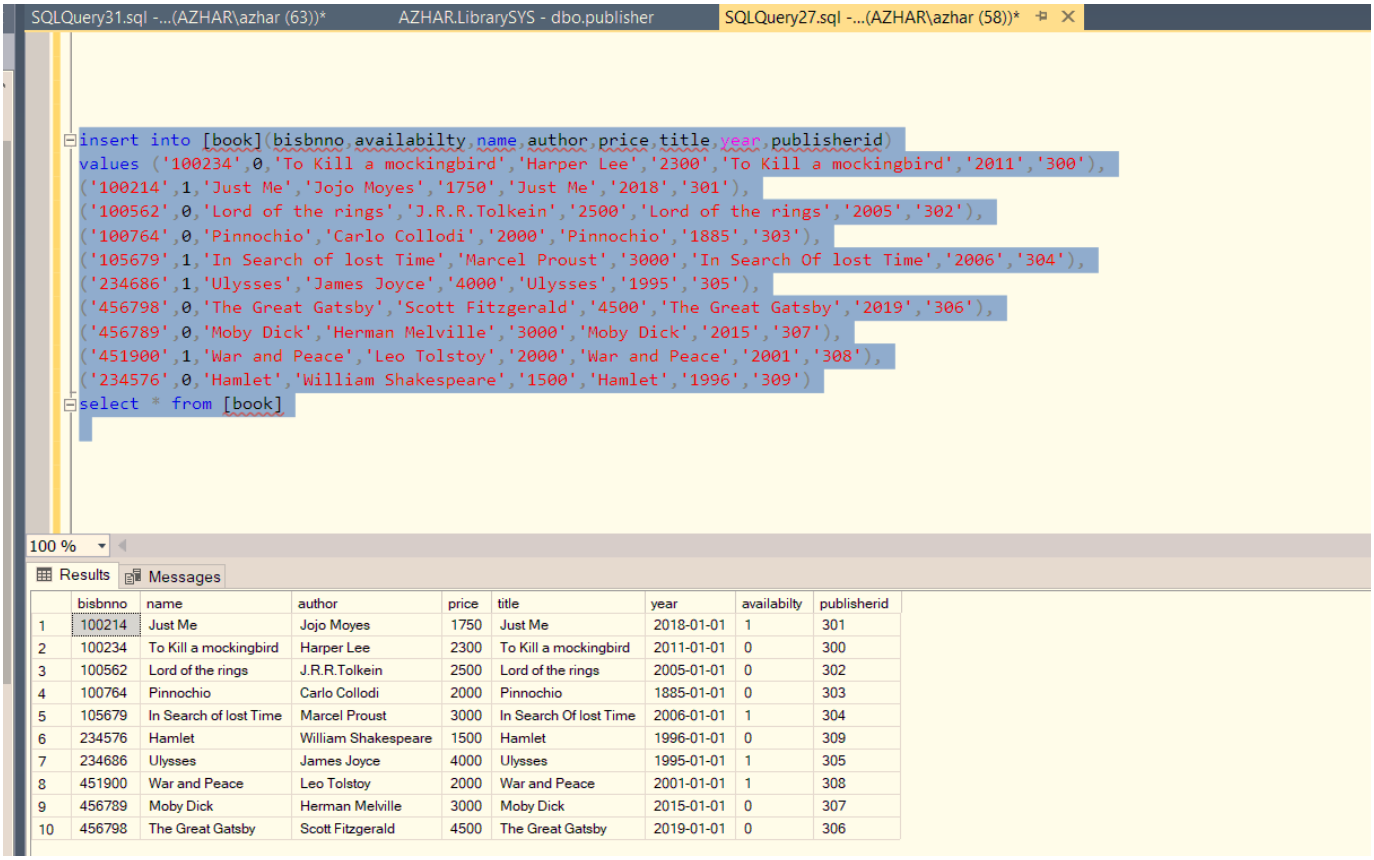
100 %

Results | Messages

	publisherid	name	address
1	300	Stark	312 North California
2	301	Clara	12 Sam street florida
3	302	Delora	38 Family Junction Pensilvania
4	303	Emilia	234 Jaffna Road, Jaffna
5	304	Madea	126 Stuart Road, Highlevel
6	305	Florence	45 North carolina
7	306	Redma	456 tranver street Matale
8	307	Tresha	56, red meat shop street
9	308	Payton	345,vermont
10	309	Darwin	34 elmore street

FIGURE 62: PUBLISHER (VALUE INSERTION)

16. Book



```
insert into [book](bisbnno,availabilty,name,author,price,title,year,publisherid)
values ('100234',0,'To Kill a mockingbird','Harper Lee','2300','To Kill a mockingbird','2011','300'),
('100214',1,'Just Me','Jojo Moyes','1750','Just Me','2018','301'),
('100562',0,'Lord of the rings','J.R.R.Tolkein','2500','Lord of the rings','2005','302'),
('100764',0,'Pinnochio','Carlo Collodi','2000','Pinnochio','1885','303'),
('105679',1,'In Search of lost Time','Marcel Proust','3000','In Search Of lost Time','2006','304'),
('234686',1,'Ulysses','James Joyce','4000','Ulysses','1995','305'),
('456798',0,'The Great Gatsby','Scott Fitzgerald','4500','The Great Gatsby','2019','306'),
('456789',0,'Moby Dick','Herman Melville','3000','Moby Dick','2015','307'),
('451900',1,'War and Peace','Leo Tolstoy','2000','War and Peace','2001','308'),
('234576',0,'Hamlet','William Shakespeare','1500','Hamlet','1996','309')
select * from [book]
```

	bisbnno	name	author	price	title	year	availabilty	publisherid
1	100214	Just Me	Jojo Moyes	1750	Just Me	2018-01-01	1	301
2	100234	To Kill a mockingbird	Harper Lee	2300	To Kill a mockingbird	2011-01-01	0	300
3	100562	Lord of the rings	J.R.R.Tolkein	2500	Lord of the rings	2005-01-01	0	302
4	100764	Pinnochio	Carlo Collodi	2000	Pinnochio	1885-01-01	0	303
5	105679	In Search of lost Time	Marcel Proust	3000	In Search Of lost Time	2006-01-01	1	304
6	234576	Hamlet	William Shakespeare	1500	Hamlet	1996-01-01	0	309
7	234686	Ulysses	James Joyce	4000	Ulysses	1995-01-01	1	305
8	451900	War and Peace	Leo Tolstoy	2000	War and Peace	2001-01-01	1	308
9	456789	Moby Dick	Herman Melville	3000	Moby Dick	2015-01-01	0	307
10	456798	The Great Gatsby	Scott Fitzgerald	4500	The Great Gatsby	2019-01-01	0	306

FIGURE 63: BOOK (VALUE INSERTION)

17. Member

```
use LibrarySYS

delete from member

INSERT INTO member(idcode,address,expdate,gender,name,contactno,memberdate)
VALUES
('10001','Colombo','20201231','Female','Ariana','0777456790','20200918'),
('10002','Wattale','20201230','Male','Dilan','0768926715','20190826'),
('10003','Kandy','20201231','Male','Ajith','0777451826','20180225'),
('10004','Homagama','20201231','Female','Disney','0712635981','20200602'),
('10005','Colombo','20201221','Female','Sheila','0712635541','20200406'),
('10006','Maharagama','20201231','Male','Malindu','0712632331','20180603'),
('10007','Colombo','20201223','Female','Shamima','0777259810','20200306'),
('10008','Awisawalla','20201211','Female','Liza','0715278810','20180812'),
('10009','Colombo','20201231','Male','Donald','0642195981','20190106'),
('10010','Wattale','20201201','Female','Danthe','0777787610','20190129')
select * from member
```

	idcode	name	address	gender	contactno	expdate	memberdate
1	10001	Ariana	Colombo	Female	0777456790	2020-12-31	2020-09-18
2	10002	Dilan	Wattale	Male	0768926715	2020-12-30	2019-08-26
3	10003	Ajith	Kandy	Male	0777451826	2020-12-31	2018-02-25
4	10004	Disney	Homagama	Female	0712635981	2020-12-31	2020-06-02
5	10005	Sheila	Colombo	Female	0712635541	2020-12-21	2020-04-06
6	10006	Malindu	Maharagama	Male	0712632331	2020-12-31	2018-06-03
7	10007	Shamima	Colombo	Female	0777259810	2020-12-23	2020-03-06
8	10008	Liza	Awisawalla	Female	0715278810	2020-12-11	2018-08-12
9	10009	Donald	Colombo	Male	0642195981	2020-12-31	2019-01-06
10	10010	Danthe	Wattale	Female	0777787610	2020-12-01	2019-01-29

FIGURE 64: MEMBER (VALUE INSERTION)

18. Student

AZHAR.LibrarySYS - dbo.member | SQLQuery37.sql -...(AZHAR\azhar (75))*

```
select * from member


INSERT INTO student(idcode,school)
VALUES('10001','Lyceum International'),
('10006','Royal College')
SELECT * FROM student
```

100 %

Results | Messages

	idcode	school
1	10001	Lyceum International
2	10006	Royal College

FIGURE 65: MEMBER STUDENT (VALUE INSERTION)

19. Copy

```
INSERT INTO copy(cno,price,cisbnno)
VALUES('20001','8000','40001'),
('20002',5000,'40002'),
('20003',10000,'40003'),
('20004',10500,'40004'),
('20005',9000,'40005'),
('20006',15000,'40006'),
('20007',2000,'40007'),
('20008',1900,'40008'),
('20009',100000,'40009'),
('20010',1000,'40010')
SELECT * FROM copy
```

100 %

Results | Messages

	cno	cisbnno	price
1	20001	40001	8000.000
2	20002	40002	5000.000
3	20003	40003	10000.000
4	20004	40004	10500.000
5	20005	40005	9000.000
6	20006	40006	15000.000
7	20007	40007	2000.000
8	20008	40008	1900.000
9	20009	40009	100000.000
10	20010	40010	1000.000

FIGURE 66: COPY (VALUE INSERTION)

20. Copy Location

SQLQuery38.sql -...(AZHAR\azhar (65))*

```
INSERT INTO copylocation(cno,location)
VALUES('20001','Homagama'),
('20002','Colombo'),
('20003','Dehiwale'),
('20004','Matale'),
('20005','Kandy'),
('20006','Nuwaraeliya'),
('20007','Hatton'),
('20008','Katunayke'),
('20009','Ampara'),
('20010','Kandy')
SELECT * FROM copylocation
```

100 %

Results | Messages

	cno	location
1	20001	Homagama
2	20002	Colombo
3	20003	Dehiwale
4	20004	Matale
5	20005	Kandy
6	20006	Nuwaraeliya
7	20007	Hatton
8	20008	Katunayke
9	20009	Ampara
10	20010	Kandy

FIGURE 67: COPY LOCATION (VALUE INSERTION)

21. Has Relationship

```
use LibrarySYS


INSERT INTO has(lno,empid,cno,bisbnno)
VALUES('001','100','20001','100234'),
('002','101','20002','100214'),
('003','102','20003','100562'),
('004','103','20004','100764'),
('005','104','20005','105679'),
('006','105','20006','234686'),
('007','106','20007','456798'),
('008','107','20008','451900'),
('009','108','20009','234576'),
('010','109','20010','789764')
SELECT * FROM has
```

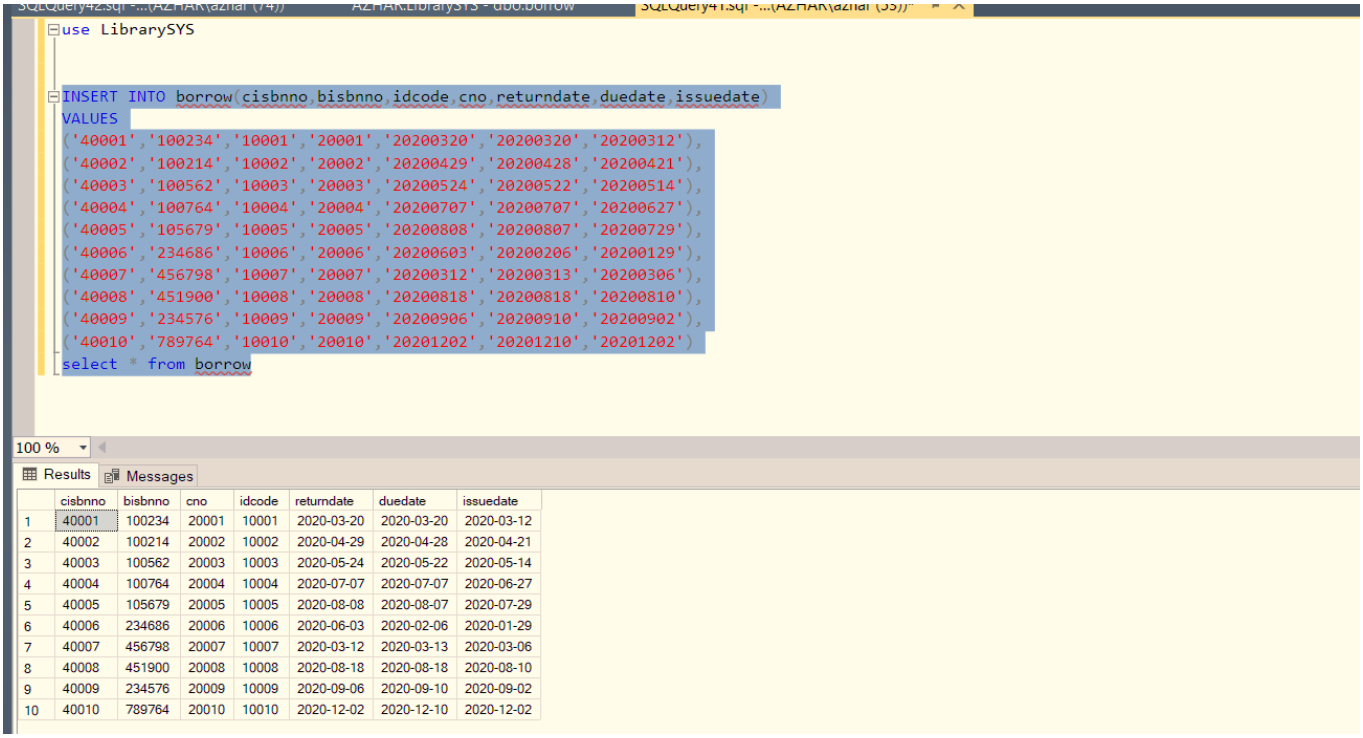
100 %

Results | Messages

	lno	empid	cno	bisbnno
1	001	100	20001	100234
2	002	101	20002	100214
3	003	102	20003	100562
4	004	103	20004	100764
5	005	104	20005	105679
6	006	105	20006	234686
7	007	106	20007	456798
8	008	107	20008	451900
9	009	108	20009	234576
10	010	109	20010	789764

FIGURE 68: HAS RELATIONSHIP (VALUE INSERTION)

22. Borrow Relationship



```
use LibrarySYS


INSERT INTO borrow(cisbnno,bisbnno,idcode,cno,returndate,duedate,issuedate)
VALUES
('40001','100234','10001','20001','20200320','20200320','20200312'),
('40002','100214','10002','20002','20200429','20200428','20200421'),
('40003','100562','10003','20003','20200524','20200522','20200514'),
('40004','100764','10004','20004','20200707','20200707','20200627'),
('40005','105679','10005','20005','20200808','20200807','20200729'),
('40006','234686','10006','20006','20200603','20200206','20200129'),
('40007','456798','10007','20007','20200312','20200313','20200306'),
('40008','451900','10008','20008','20200818','20200818','20200810'),
('40009','234576','10009','20009','20200906','20200910','20200902'),
('40010','789764','10010','20010','20201202','20201210','20201202')
select * from borrow
```

100 %

Results | Messages

	cisbnno	bisbnno	cno	idcode	returndate	duedate	issuedate
1	40001	100234	20001	10001	2020-03-20	2020-03-20	2020-03-12
2	40002	100214	20002	10002	2020-04-29	2020-04-28	2020-04-21
3	40003	100562	20003	10003	2020-05-24	2020-05-22	2020-05-14
4	40004	100764	20004	10004	2020-07-07	2020-07-07	2020-06-27
5	40005	105679	20005	10005	2020-08-08	2020-08-07	2020-07-29
6	40006	234686	20006	10006	2020-06-03	2020-02-06	2020-01-29
7	40007	456798	20007	10007	2020-03-12	2020-03-13	2020-03-06
8	40008	451900	20008	10008	2020-08-18	2020-08-18	2020-08-10
9	40009	234576	20009	10009	2020-09-06	2020-09-10	2020-09-02
10	40010	789764	20010	10010	2020-12-02	2020-12-10	2020-12-02

FIGURE 69: BORROW RELATIONSHIP (VALUE INSERTION)

Workload Matrix

Member Activity	J A Mujeeb	S S N S Nevins	G M D D Ratnayke	S O Perera	S P Ratnayake	W N D Perera
Section 01	S	S	S	S	S	R
Section 02	R	S	R	S	S	S
Section 03	R	R	S	R	S	S
Section 04	R	R	R	R	S	S
Report	R	R	R	R	S	R
Presentation	S	R	R	R	S	S

R - Responsible Member
S - Supporting Member