Relational Database Project Report

Team Members:
Alexander Rosati
Brendan Batchelor

Group Name:
Team Library

Date:
April 15, 2020

Click here to watch the demo

Table of Contents

Basic Project Information

Title	Almomani Library Helper
DBMS	SQL Server 2019 Developer
Language	C#
Technologies	WPF and XAML
GitHub Repository	https://github.com/lab4account/421Interface
Emails	ajrosati@umich.edu bbatchel@umich.edu
Enterprise	Almomani Public Library
Description	A library management system that has many features including allowing users to check in and check out books and determining who owes what to the library. This application was developed for a fictional library named Almomani Public Library. ***Click here to watch the demo.***

Note: *All of our code is available via GitHub. Click the link above to access our code.*

Responsibilities

Team Member	**Tasks**
Alexander Rosati	database requirements, ER diagram, loading data, ten of the SQL statements, report, convert ER to relational, wrote SQL that creates database
Brendan Batchelor	5 of the SQL statements, UI Design, wrote entire interface, testing

Enterprise Information

Name	Almomani Public Library
Owner	Raed Almomani
Description	A public library located in Dearborn, MI. Allows members to checkout books. Each nonfiction book in the library has a call number. Fiction books do not have call numbers. Books are placed in sections (e.g., History, Romance, Mystery, etc.) Fiction titles are sorted alphabetically by author's last name. Nonfiction is sorted by call number. Sections in the library include: 1. Science Fiction 2. Fantasy 3. Horror 4. Romance 5. Mystery 6. Young Adult 7. Children's Literature 8. Philosophy 9. Religion 10. Social Sciences 11. Language 12. Science 13. Arts & Recreation 14. History 15. Miscellaneous There is a late fee of 5¢ per day. Each book must be returned within 2 weeks. The call numbers will contain a series of decimal digits separated by periods followed by the first three letters of the author's last name. For example, *The Great Book of Ice Hockey: Interesting Facts and Sports Stories (Sports Trivia) (Volume 1)* written by Ryan Black would have call number 796.96 BLA. '796.96' represents the subject of hockey. 'BLA' are the first three letters of the author's last name, Black. Each member will have a library card which has their member ID on it. Each copy of a book will contain its book copy ID.
Location	5555 Evergreen Rd, Dearborn, MI 48128

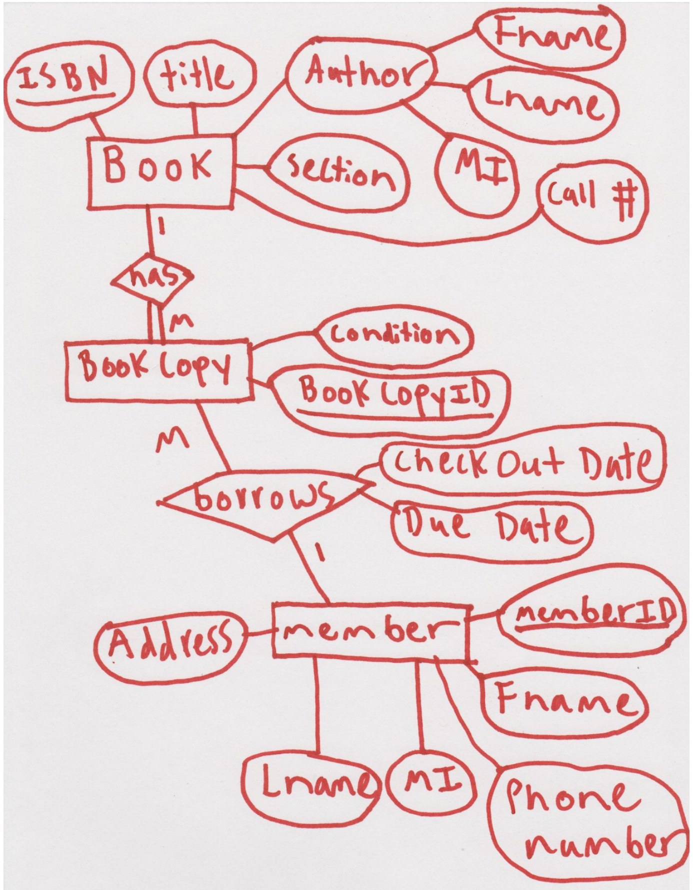
Database Requirements

- Data Requirements
    - The database will contain the ISBN, title, author, and the section for each book.
    - A book is either fiction or nonfiction.
    - A call number will be stored for each nonfiction book.
    - The database will contain the quality of each copy of a book. The quality can be either very good, good, decent, poor.
    - For each copy of a book we will store the book copy ID and the condition of the copy.
    - The database will contain the member ID, first name, mital initial, last name, address, and phone number for each member.
    - For each copy of a book that is checked out, the database will contain which member checked it out, the date it was checked out, and the date the copy should be returned by.
- Functional Requirements
    - User, a librarian, should be able to insert a book using the interface.
    - User should be able to insert a copy of a book using the interface.
    - User should be able to insert a member using the interface.
    - User should be able to checkout a book using the interface. User enters the member's ID and the ID of the copy of the book and then clicks a checkout button. The current date and due date will be displayed.
    - User can delete a member manually only if that member has nothing checked out.
    - User can check in a copy of a book using the interface. User will enter the member ID and book copy ID and then click check in.
    - User can delete a book copy from the system if it is not checked out using the interface. User will enter the book copy ID and then click a remove button.
    - A book can be removed if there are no copies in the system. User can remove a book by first entering the ISBN and then clicking a delete button.
    - A query that finds the member's name, member's phone number, member's address, the title of the book that the member borrowed, when they were supposed to return it, and how much money they owe for each book that is overdue. Interface will display the results of this query.
    - A query that finds the ISBN, title, author's last name, author's first name, author's middle initial, the section, and, if any, the call number for each

book in the library. The books are sorted alphabetically by author's last name in ascending order. The interface will display the results.

- A query that finds the ISBN, title, author's last name, author's first name, author's middle initial, the section, and, if any, the call number for each book in the library. The books are sorted alphabetically by title in ascending order. The interface will display the results.
- A query that finds the book copy ID, title, condition, and whether it is currently checked in or checked out for each copy of a book with a certain ISBN number. The interface will display the results.
- User can update the condition of a copy of a book.
- User can update a member's phone number.
- User can update a member's address

Entity Relationship Diagram



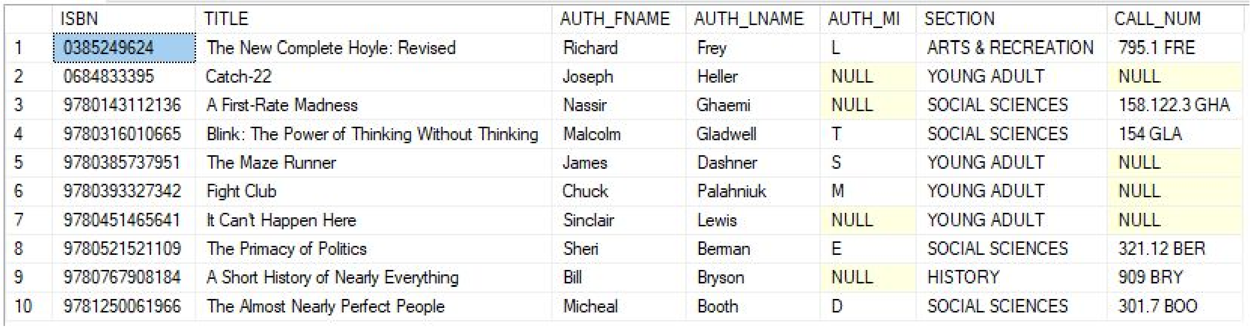
Note: *We decided to hand draw the ER diagram, rather than create it with software, so that we could use the notation discussed in class.*

Relational Database Schema

BOOK(ISBN, TITLE, AUTH_FNAME, AUTH_LNAME, AUTH_MI, SECTION, CALL#)
BOOK_COPY(BOOK_COPY_ID, ISBN, CONDITION)
MEMBER(MEM_ID, FNAME, MI, LNAME, ADDRESS, PHONE#)
BOOK_CHECKOUT(BOOK_COPY_ID, MEM_ID, CHECK_OUT_DATE, DUE_DATE)

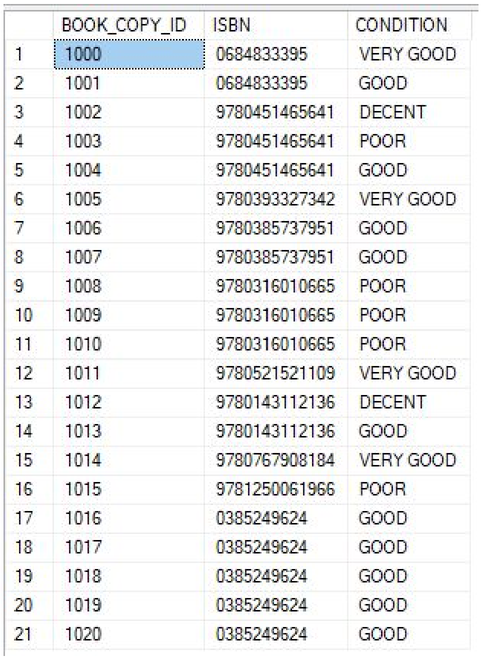
Sample Database

BOOK



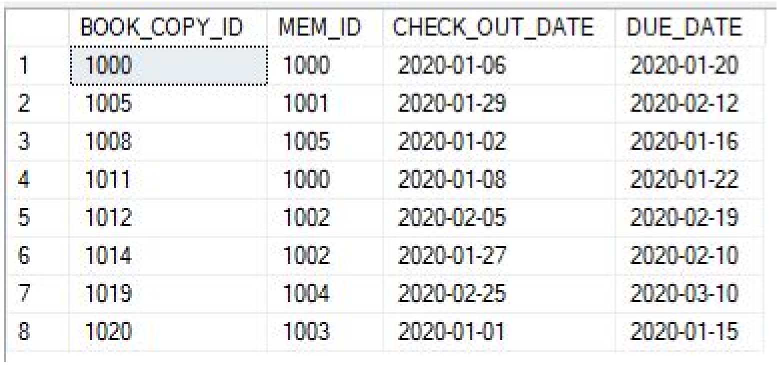
	ISBN	TITLE	AUTH_FNAME	AUTH_LNAME	AUTH_MI	SECTION	CALL_NUM
1	0385249624	The New Complete Hoyle: Revised	Richard	Frey	L	ARTS & RECREATION	795.1 FRE
2	0684833395	Catch-22	Joseph	Heller	NULL	YOUNG ADULT	NULL
3	9780143112136	A First-Rate Madness	Nassir	Ghaemi	NULL	SOCIAL SCIENCES	158.122.3 GHA
4	9780316010665	Blink: The Power of Thinking Without Thinking	Malcolm	Gladwell	T	SOCIAL SCIENCES	154 GLA
5	9780385737951	The Maze Runner	James	Dashner	S	YOUNG ADULT	NULL
6	9780393327342	Fight Club	Chuck	Palahniuk	M	YOUNG ADULT	NULL
7	9780451465641	It Can't Happen Here	Sinclair	Lewis	NULL	YOUNG ADULT	NULL
8	9780521521109	The Primacy of Politics	Sheri	Berman	E	SOCIAL SCIENCES	321.12 BER
9	9780767908184	A Short History of Nearly Everything	Bill	Bryson	NULL	HISTORY	909 BRY
10	9781250061966	The Almost Nearly Perfect People	Micheal	Booth	D	SOCIAL SCIENCES	301.7 BOO

BOOK_COPY



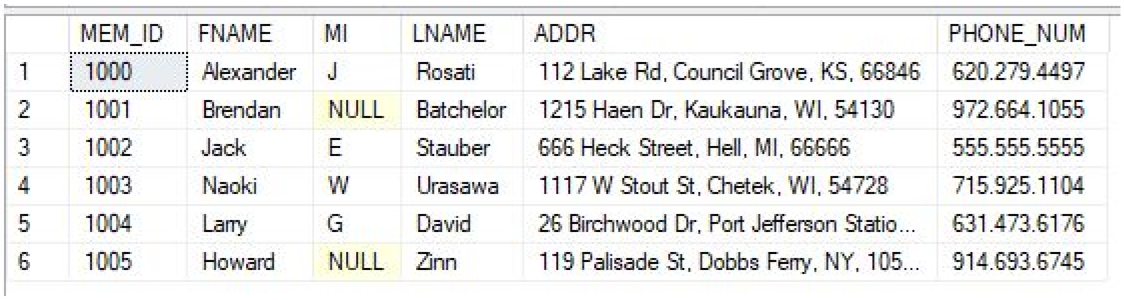
	BOOK_COPY_ID	ISBN	CONDITION
1	1000	0684833395	VERY GOOD
2	1001	0684833395	GOOD
3	1002	9780451465641	DECENT
4	1003	9780451465641	POOR
5	1004	9780451465641	GOOD
6	1005	9780393327342	VERY GOOD
7	1006	9780385737951	GOOD
8	1007	9780385737951	GOOD
9	1008	9780316010665	POOR
10	1009	9780316010665	POOR
11	1010	9780316010665	POOR
12	1011	9780521521109	VERY GOOD
13	1012	9780143112136	DECENT
14	1013	9780143112136	GOOD
15	1014	9780767908184	VERY GOOD
16	1015	9781250061966	POOR
17	1016	0385249624	GOOD
18	1017	0385249624	GOOD
19	1018	0385249624	GOOD
20	1019	0385249624	GOOD
21	1020	0385249624	GOOD

BOOK_CHECKOUT



	BOOK_COPY_ID	MEM_ID	CHECK_OUT_DATE	DUE_DATE
1	1000	1000	2020-01-06	2020-01-20
2	1005	1001	2020-01-29	2020-02-12
3	1008	1005	2020-01-02	2020-01-16
4	1011	1000	2020-01-08	2020-01-22
5	1012	1002	2020-02-05	2020-02-19
6	1014	1002	2020-01-27	2020-02-10
7	1019	1004	2020-02-25	2020-03-10
8	1020	1003	2020-01-01	2020-01-15

MEMBER



	MEM_ID	FNAME	MI	LNAME	ADDR	PHONE_NUM
1	1000	Alexander	J	Rosati	112 Lake Rd, Council Grove, KS, 66846	620.279.4497
2	1001	Brendan	NULL	Batchelor	1215 Haen Dr, Kaukauna, WI, 54130	972.664.1055
3	1002	Jack	E	Stauber	666 Heck Street, Hell, MI, 66666	555.555.5555
4	1003	Naoki	W	Urasawa	1117 W Stout St, Chetek, WI, 54728	715.925.1104
5	1004	Larry	G	David	26 Birchwood Dr, Port Jefferson Statio...	631.473.6176
6	1005	Howard	NULL	Zinn	119 Palisade St, Dobbs Ferry, NY, 105...	914.693.6745

SQL Statements

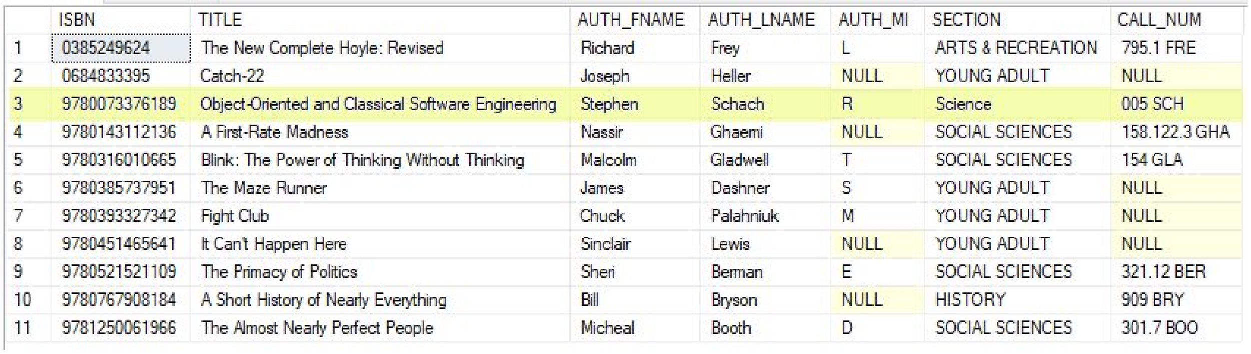
Statement 1

INSERT INTO BOOK(ISBN, TITLE, AUTH_FNAME, AUTH_LNAME, AUTH_MI, SECTION, CALL_NUM) VALUES(V1, V2, V3, V4, V5, V6, V7);

E.g.,

INSERT INTO BOOK(ISBN, TITLE, AUTH_FNAME, AUTH_LNAME, AUTH_MI, SECTION, CALL_NUM) VALUES(‘9780073376189’, ‘Object-Oriented and Classical Software Engineering’, ‘Stephen’, ‘Schach’, ‘R’, ‘Science’, ‘005 SCH’);

Result



	ISBN	TITLE	AUTH_FNAME	AUTH_LNAME	AUTH_MI	SECTION	CALL_NUM
1	0385249624	The New Complete Hoyle: Revised	Richard	Frey	L	ARTS & RECREATION	795.1 FRE
2	0684833395	Catch-22	Joseph	Heller	NULL	YOUNG ADULT	NULL
3	9780073376189	Object-Oriented and Classical Software Engineering	Stephen	Schach	R	Science	005 SCH
4	9780143112136	A First-Rate Madness	Nassir	Ghaemi	NULL	SOCIAL SCIENCES	158.122.3 GHA
5	9780316010665	Blink: The Power of Thinking Without Thinking	Malcolm	Gladwell	T	SOCIAL SCIENCES	154 GLA
6	9780385737951	The Maze Runner	James	Dashner	S	YOUNG ADULT	NULL
7	9780393327342	Fight Club	Chuck	Palahniuk	M	YOUNG ADULT	NULL
8	9780451465641	It Can't Happen Here	Sinclair	Lewis	NULL	YOUNG ADULT	NULL
9	9780521521109	The Primacy of Politics	Sheri	Berman	E	SOCIAL SCIENCES	321.12 BER
10	9780767908184	A Short History of Nearly Everything	Bill	Bryson	NULL	HISTORY	909 BRY
11	9781250061966	The Almost Nearly Perfect People	Micheal	Booth	D	SOCIAL SCIENCES	301.7 BOO

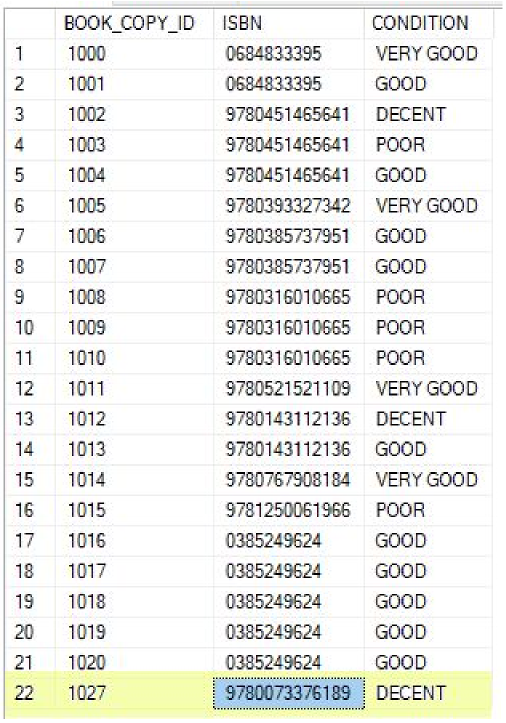
Statement 2

INSERT INTO BOOK_COPY(ISBN, CONDITION) VALUES(V1, V2);

E.g.,

INSERT INTO BOOK_COPY(ISBN, CONDITION)
VALUES(‘9780073376189’, ‘DECENT’);

Result



	BOOK_COPY_ID	ISBN	CONDITION
1	1000	0684833395	VERY GOOD
2	1001	0684833395	GOOD
3	1002	9780451465641	DECENT
4	1003	9780451465641	POOR
5	1004	9780451465641	GOOD
6	1005	9780393327342	VERY GOOD
7	1006	9780385737951	GOOD
8	1007	9780385737951	GOOD
9	1008	9780316010665	POOR
10	1009	9780316010665	POOR
11	1010	9780316010665	POOR
12	1011	9780521521109	VERY GOOD
13	1012	9780143112136	DECENT
14	1013	9780143112136	GOOD
15	1014	9780767908184	VERY GOOD
16	1015	9781250061966	POOR
17	1016	0385249624	GOOD
18	1017	0385249624	GOOD
19	1018	0385249624	GOOD
20	1019	0385249624	GOOD
21	1020	0385249624	GOOD
22	1027	9780073376189	DECENT

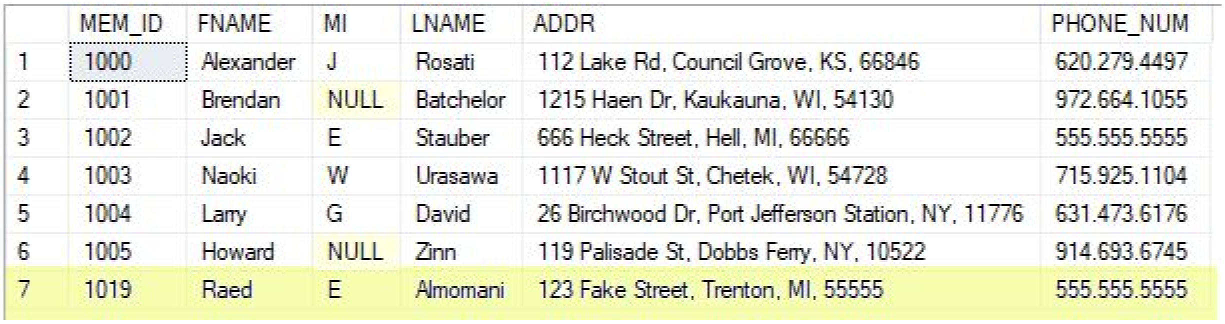
Statement 3

```
INSERT INTO MEMBER(FNAME, MI, LNAME, ADDR, PHONE_NUM)
VALUES (V1, V2, V3, V4, V5);
```

E.g.,

```
INSERT INTO MEMBER(FNAME, MI, LNAME, ADDR, PHONE_NUM)
VALUES (‘Raed’, ‘E’, ‘Almomani’, ‘123 Fake Street, Trenton, MI, 55555’,
‘555.555.5555’);
```

Result



	MEM_ID	FNAME	MI	LNAME	ADDR	PHONE_NUM
1	1000	Alexander	J	Rosati	112 Lake Rd, Council Grove, KS, 66846	620.279.4497
2	1001	Brendan	NULL	Batchelor	1215 Haen Dr, Kaukauna, WI, 54130	972.664.1055
3	1002	Jack	E	Stauber	666 Heck Street, Hell, MI, 66666	555.555.5555
4	1003	Naoki	W	Urasawa	1117 W Stout St, Chetek, WI, 54728	715.925.1104
5	1004	Larry	G	David	26 Birchwood Dr, Port Jefferson Station, NY, 11776	631.473.6176
6	1005	Howard	NULL	Zinn	119 Palisade St, Dobbs Ferry, NY, 10522	914.693.6745
7	1019	Raed	E	Almomani	123 Fake Street, Trenton, MI, 55555	555.555.5555

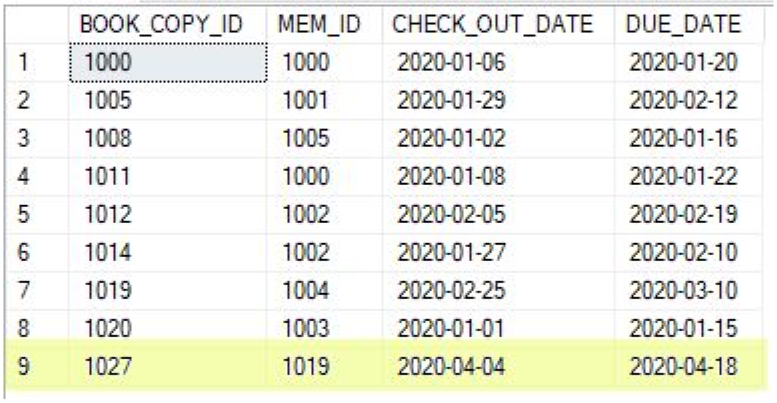
Statement 4

```
INSERT INTO BOOK_CHECKOUT(BOOK_COPY_ID, MEM_ID, CHECK_OUT_DATE,
DUE_DATE) VALUES (V1, V2, GETDATE(), DATEADD(DAY, 14, GETDATE()));
```

E.g.,

```
INSERT INTO BOOK_CHECKOUT(BOOK_COPY_ID, MEM_ID, CHECK_OUT_DATE,
DUE_DATE) VALUES (1027, 1019, GETDATE(), DATEADD(DAY, 14, GETDATE()));
```

Results



	BOOK_COPY_ID	MEM_ID	CHECK_OUT_DATE	DUE_DATE
1	1000	1000	2020-01-06	2020-01-20
2	1005	1001	2020-01-29	2020-02-12
3	1008	1005	2020-01-02	2020-01-16
4	1011	1000	2020-01-08	2020-01-22
5	1012	1002	2020-02-05	2020-02-19
6	1014	1002	2020-01-27	2020-02-10
7	1019	1004	2020-02-25	2020-03-10
8	1020	1003	2020-01-01	2020-01-15
9	1027	1019	2020-04-04	2020-04-18

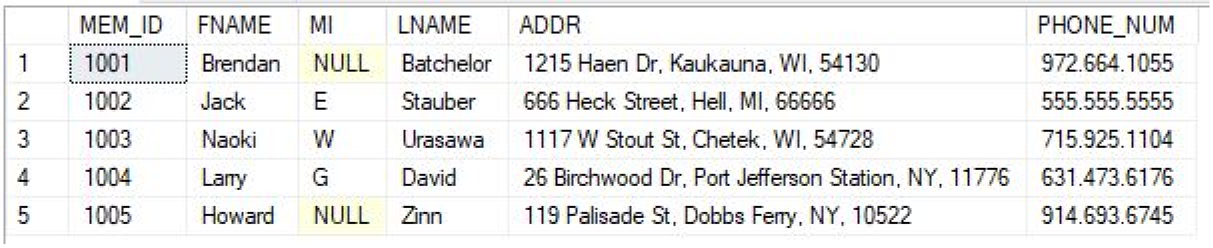
Statement 5

DELETE FROM MEMBER
WHERE MEM_ID = V1;

E.g.,

DELETE FROM MEMBER
WHERE MEM_ID = 1000;

Results



	MEM_ID	FNAME	MI	LNAME	ADDR	PHONE_NUM
1	1001	Brendan	NULL	Batchelor	1215 Haen Dr, Kaukauna, WI, 54130	972.664.1055
2	1002	Jack	E	Stauber	666 Heck Street, Hell, MI, 66666	555.555.5555
3	1003	Naoki	W	Urasawa	1117 W Stout St, Chetek, WI, 54728	715.925.1104
4	1004	Larry	G	David	26 Birchwood Dr, Port Jefferson Station, NY, 11776	631.473.6176
5	1005	Howard	NULL	Zinn	119 Palisade St, Dobbs Ferry, NY, 10522	914.693.6745

The member ‘Alexander Rosati’ has been removed from the MEMBER table. Note that I had to check in all of the member’s books before I could delete them from the MEMBER table. Otherwise, SQL Server would have given me an error for violating inferential integrity constraints.

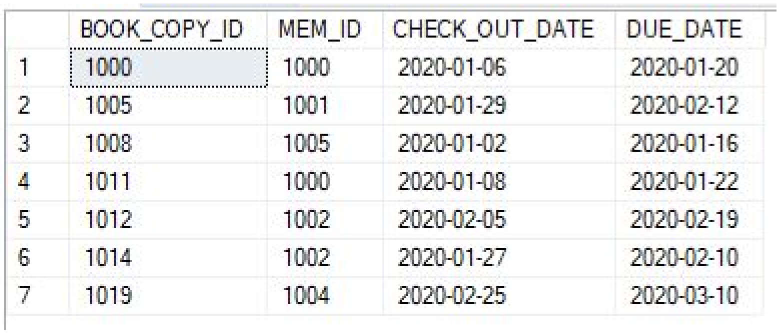
Statement 6

```
DELETE FROM BOOK_CHECKOUT
WHERE BOOK_COPY_ID = V1;
```

E.g.,

```
DELETE FROM BOOK_CHECKOUT
WHERE BOOK_COPY_ID = 1020;
```

Results



	BOOK_COPY_ID	MEM_ID	CHECK_OUT_DATE	DUE_DATE
1	1000	1000	2020-01-06	2020-01-20
2	1005	1001	2020-01-29	2020-02-12
3	1008	1005	2020-01-02	2020-01-16
4	1011	1000	2020-01-08	2020-01-22
5	1012	1002	2020-02-05	2020-02-19
6	1014	1002	2020-01-27	2020-02-10
7	1019	1004	2020-02-25	2020-03-10

The record with 1020 for BOOK_COPY_ID has been removed from BOOK_CHECKOUT. Thus, the book with ID 1020 has been checked in and is available to other members now.

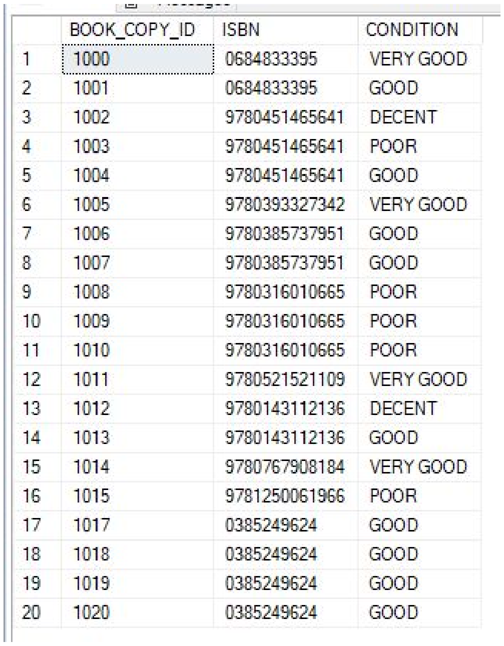
Statement 7

```
DELETE FROM BOOK_COPY
WHERE BOOK_COPY_ID = V1;
```

E.g.,

```
DELETE FROM BOOK_COPY
WHERE BOOK_COPY_ID = 1016;
```

Results



	BOOK_COPY_ID	ISBN	CONDITION
1	1000	0684833395	VERY GOOD
2	1001	0684833395	GOOD
3	1002	9780451465641	DECENT
4	1003	9780451465641	POOR
5	1004	9780451465641	GOOD
6	1005	9780393327342	VERY GOOD
7	1006	9780385737951	GOOD
8	1007	9780385737951	GOOD
9	1008	9780316010665	POOR
10	1009	9780316010665	POOR
11	1010	9780316010665	POOR
12	1011	9780521521109	VERY GOOD
13	1012	9780143112136	DECENT
14	1013	9780143112136	GOOD
15	1014	9780767908184	VERY GOOD
16	1015	9781250061966	POOR
17	1017	0385249624	GOOD
18	1018	0385249624	GOOD
19	1019	0385249624	GOOD
20	1020	0385249624	GOOD

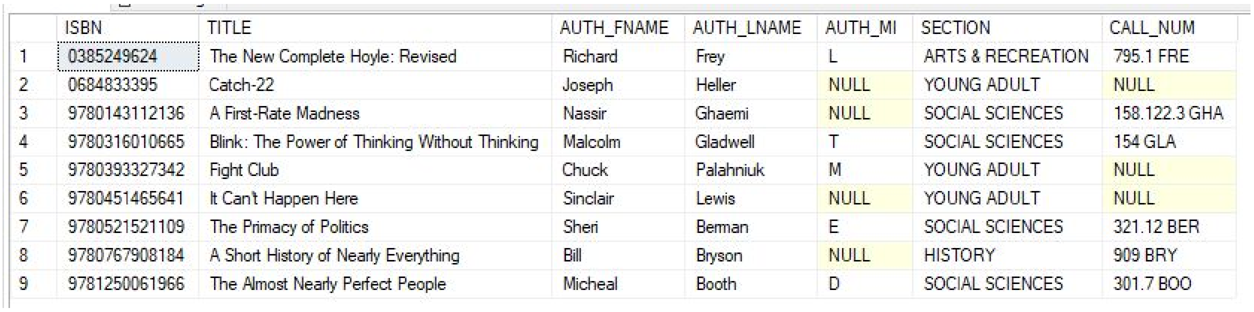
The record where BOOK_COPY_ID was 1016 has been removed.

Statement 8

DELETE FROM BOOK
WHERE ISBN = V1;

E.g.,

DELETE FROM BOOK
WHERE ISBN = ‘9780385737951’;



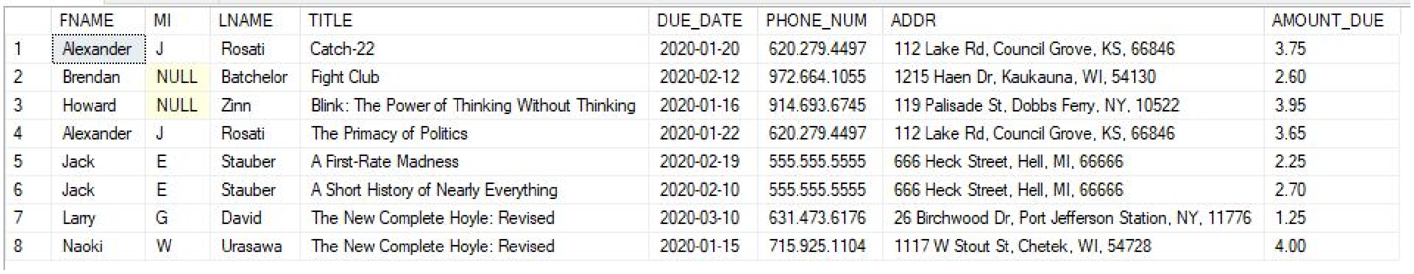
	ISBN	TITLE	AUTH_FNAME	AUTH_LNAME	AUTH_MI	SECTION	CALL_NUM
1	0385249624	The New Complete Hoyle: Revised	Richard	Frey	L	ARTS & RECREATION	795.1 FRE
2	0684833395	Catch-22	Joseph	Heller	NULL	YOUNG ADULT	NULL
3	9780143112136	A First-Rate Madness	Nassir	Ghaemi	NULL	SOCIAL SCIENCES	158.122.3 GHA
4	9780316010665	Blink: The Power of Thinking Without Thinking	Malcolm	Gladwell	T	SOCIAL SCIENCES	154 GLA
5	9780393327342	Fight Club	Chuck	Palahniuk	M	YOUNG ADULT	NULL
6	9780451465641	It Can't Happen Here	Sinclair	Lewis	NULL	YOUNG ADULT	NULL
7	9780521521109	The Primacy of Politics	Sheri	Berman	E	SOCIAL SCIENCES	321.12 BER
8	9780767908184	A Short History of Nearly Everything	Bill	Bryson	NULL	HISTORY	909 BRY
9	9781250061966	The Almost Nearly Perfect People	Micheal	Booth	D	SOCIAL SCIENCES	301.7 BOO

Note: The book ‘Maze Runner’ was removed. I had to remove all copies to do this.

Statement 9

SELECT M.FNAME, M.MI, M.LNAME, B.TITLE, BCO.DUE_DATE, M.PHONE_NUM, M.ADDR, 0.05 * DATEDIFF(DAY, BCO.DUE_DATE, GETDATE()) AS AMOUNT_DUE
FROM MEMBER M, BOOK B, BOOK_CHECKOUT BCO, BOOK_COPY BC
WHERE BCO.BOOK_COPY_ID = BC.BOOK_COPY_ID **AND** BC.ISBN = B.ISBN **AND** BCO.MEM_ID=M.MEM_ID **AND** DATEDIFF(DAY, BCO.DUE_DATE, GETDATE()) >= 1;

Results



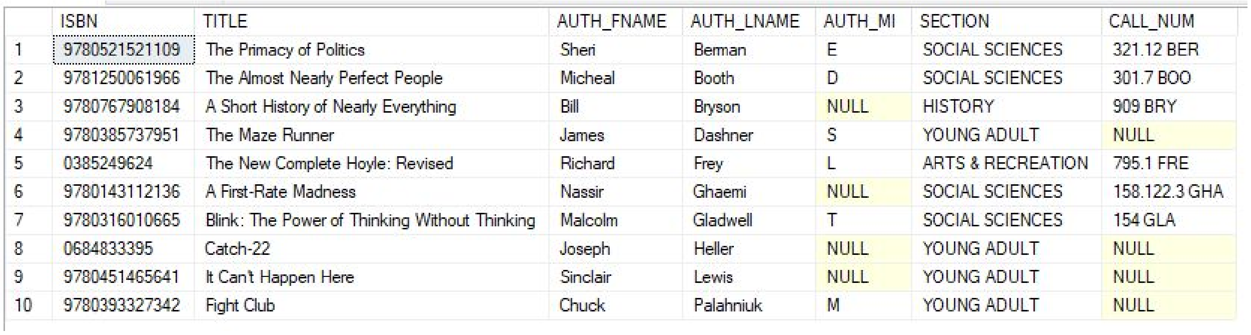
	FNAME	MI	LNAME	TITLE	DUE_DATE	PHONE_NUM	ADDR	AMOUNT_DUE
1	Alexander	J	Rosati	Catch-22	2020-01-20	620.279.4497	112 Lake Rd, Council Grove, KS, 66846	3.75
2	Brendan	NULL	Batchelor	Fight Club	2020-02-12	972.664.1055	1215 Haen Dr, Kaukauna, WI, 54130	2.60
3	Howard	NULL	Zinn	Blink: The Power of Thinking Without Thinking	2020-01-16	914.693.6745	119 Palisade St, Dobbs Ferry, NY, 10522	3.95
4	Alexander	J	Rosati	The Primacy of Politics	2020-01-22	620.279.4497	112 Lake Rd, Council Grove, KS, 66846	3.65
5	Jack	E	Stauber	A First-Rate Madness	2020-02-19	555.555.5555	666 Heck Street, Hell, MI, 66666	2.25
6	Jack	E	Stauber	A Short History of Nearly Everything	2020-02-10	555.555.5555	666 Heck Street, Hell, MI, 66666	2.70
7	Larry	G	David	The New Complete Hoyle: Revised	2020-03-10	631.473.6176	26 Birchwood Dr, Port Jefferson Station, NY, 11776	1.25
8	Naoki	W	Urasawa	The New Complete Hoyle: Revised	2020-01-15	715.925.1104	1117 W Stout St, Chetek, WI, 54728	4.00

Note: The query above displays all late fees. Since the due dates in the sample data do not change as time goes on, the late fees will increase over time. So, if you run the query with our sample data, you will not get the same fees. Your fees will be higher.

Statement 10

SELECT *
FROM BOOK
ORDER BY AUTH_LNAME ASC;

Results

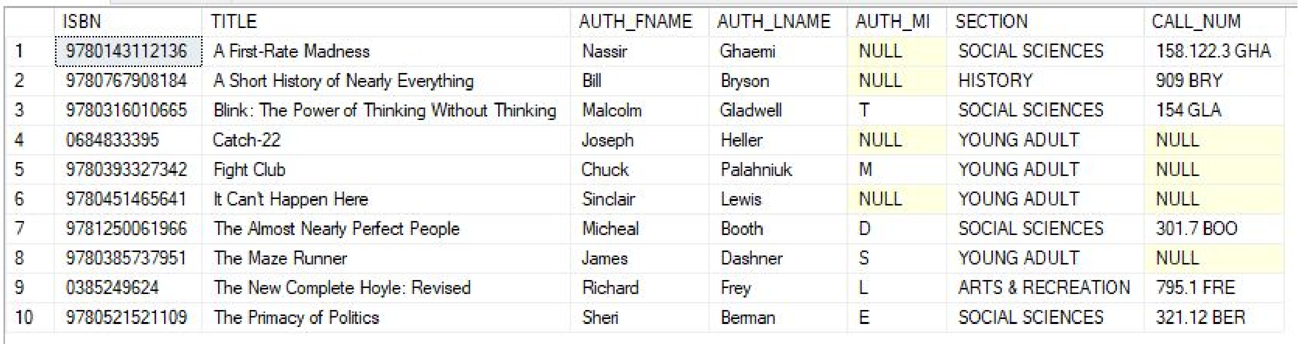


	ISBN	TITLE	AUTH_FNAME	AUTH_LNAME	AUTH_MI	SECTION	CALL_NUM
1	9780521521109	The Primacy of Politics	Sheri	Berman	E	SOCIAL SCIENCES	321.12 BER
2	9781250061966	The Almost Nearly Perfect People	Micheal	Booth	D	SOCIAL SCIENCES	301.7 BOO
3	9780767908184	A Short History of Nearly Everything	Bill	Bryson	NULL	HISTORY	909 BRY
4	9780385737951	The Maze Runner	James	Dashner	S	YOUNG ADULT	NULL
5	0385249624	The New Complete Hoyle: Revised	Richard	Frey	L	ARTS & RECREATION	795.1 FRE
6	9780143112136	A First-Rate Madness	Nassir	Ghaemi	NULL	SOCIAL SCIENCES	158.122.3 GHA
7	9780316010665	Blink: The Power of Thinking Without Thinking	Malcolm	Gladwell	T	SOCIAL SCIENCES	154 GLA
8	0684833395	Catch-22	Joseph	Heller	NULL	YOUNG ADULT	NULL
9	9780451465641	It Can't Happen Here	Sinclair	Lewis	NULL	YOUNG ADULT	NULL
10	9780393327342	Fight Club	Chuck	Palahniuk	M	YOUNG ADULT	NULL

Statement 11

```
SELECT *
FROM BOOK
ORDER BY TITLE;
```

Results



	ISBN	TITLE	AUTH_FNAME	AUTH_LNAME	AUTH_MI	SECTION	CALL_NUM
1	9780143112136	A First-Rate Madness	Nassir	Ghaemi	NULL	SOCIAL SCIENCES	158.122.3 GHA
2	9780767908184	A Short History of Nearly Everything	Bill	Bryson	NULL	HISTORY	909 BRY
3	9780316010665	Blink: The Power of Thinking Without Thinking	Malcolm	Gladwell	T	SOCIAL SCIENCES	154 GLA
4	0684833395	Catch-22	Joseph	Heller	NULL	YOUNG ADULT	NULL
5	9780393327342	Fight Club	Chuck	Palahniuk	M	YOUNG ADULT	NULL
6	9780451465641	It Can't Happen Here	Sinclair	Lewis	NULL	YOUNG ADULT	NULL
7	9781250061966	The Almost Nearly Perfect People	Micheal	Booth	D	SOCIAL SCIENCES	301.7 BOO
8	9780385737951	The Maze Runner	James	Dashner	S	YOUNG ADULT	NULL
9	0385249624	The New Complete Hoyle: Revised	Richard	Frey	L	ARTS & RECREATION	795.1 FRE
10	9780521521109	The Primacy of Politics	Sheri	Berman	E	SOCIAL SCIENCES	321.12 BER

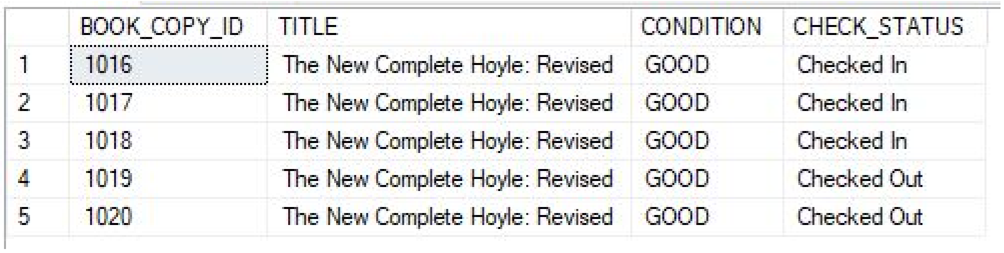
Statement 12

```
SELECT DISTINCT COP.BOOK_COPY_ID, B.TITLE, COP.CONDITION,
(SELECT CASE WHEN (EXISTS (SELECT * FROM BOOK_CHECKOUT BCO
WHERE BCO.BOOK_COPY_ID = COP.BOOK_COPY_ID))
THEN 'Checked Out'
ELSE 'Checked In' END) AS CHECK_STATUS

FROM BOOK_COPY COP, BOOK B
WHERE V1 = B.ISBN AND B.ISBN = COP.ISBN
```

E.g.,

```
SELECT DISTINCT COP.BOOK_COPY_ID, B.TITLE, COP.CONDITION,
(SELECT CASE WHEN (EXISTS (SELECT * FROM BOOK_CHECKOUT BCO
WHERE BCO.BOOK_COPY_ID = COP.BOOK_COPY_ID))
THEN 'Checked Out'
ELSE 'Checked In' END) AS CHECK_STATUS

FROM BOOK_COPY COP, BOOK B
WHERE '0385249624' = B.ISBN AND B.ISBN = COP.ISBN
```

Results



	BOOK_COPY_ID	TITLE	CONDITION	CHECK_STATUS
1	1016	The New Complete Hoyle: Revised	GOOD	Checked In
2	1017	The New Complete Hoyle: Revised	GOOD	Checked In
3	1018	The New Complete Hoyle: Revised	GOOD	Checked In
4	1019	The New Complete Hoyle: Revised	GOOD	Checked Out
5	1020	The New Complete Hoyle: Revised	GOOD	Checked Out

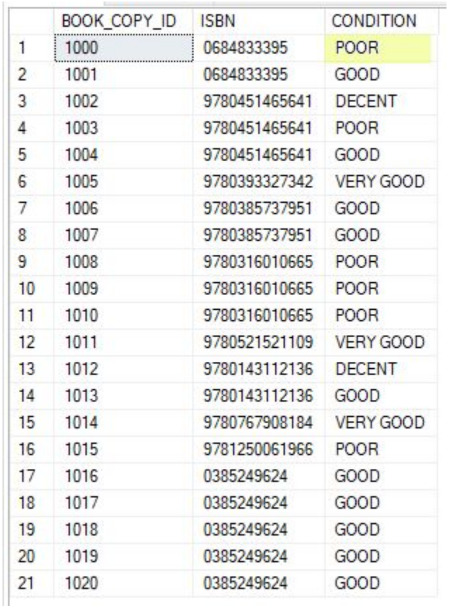
Statement 13

```
UPDATE BOOK_COPY
SET CONDITION = V1
WHERE BOOK_COPY_ID = V2;
```

E.g.,

```
UPDATE BOOK_COPY
SET CONDITION = ‘POOR’
WHERE BOOK_COPY_ID = 1000;
```

Results



	BOOK_COPY_ID	ISBN	CONDITION
1	1000	0684833395	POOR
2	1001	0684833395	GOOD
3	1002	9780451465641	DECENT
4	1003	9780451465641	POOR
5	1004	9780451465641	GOOD
6	1005	9780393327342	VERY GOOD
7	1006	9780385737951	GOOD
8	1007	9780385737951	GOOD
9	1008	9780316010665	POOR
10	1009	9780316010665	POOR
11	1010	9780316010665	POOR
12	1011	9780521521109	VERY GOOD
13	1012	9780143112136	DECENT
14	1013	9780143112136	GOOD
15	1014	9780767908184	VERY GOOD
16	1015	9781250061966	POOR
17	1016	0385249624	GOOD
18	1017	0385249624	GOOD
19	1018	0385249624	GOOD
20	1019	0385249624	GOOD
21	1020	0385249624	GOOD

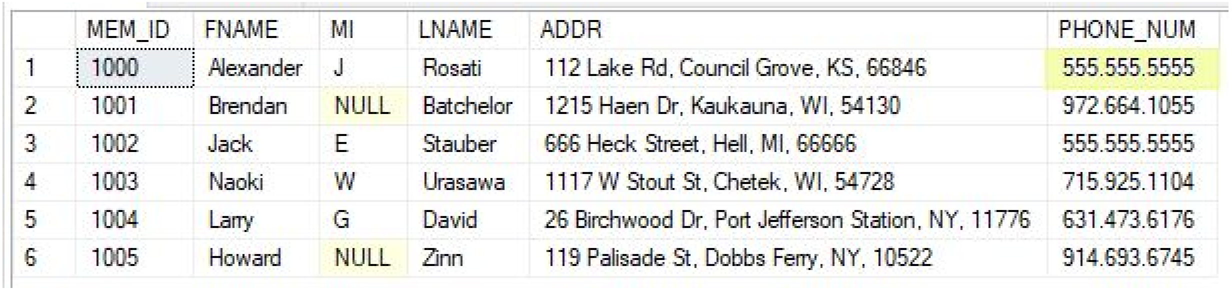
Statement 14

```
UPDATE MEMBER
SET PHONE_NUM = V1
WHERE MEM_ID = V2;
```

E.g.,

```
UPDATE MEMBER
SET PHONE_NUM = ‘555.555.5555’
WHERE MEM_ID = 1000;
```

Results



	MEM_ID	FNAME	MI	LNAME	ADDR	PHONE_NUM
1	1000	Alexander	J	Rosati	112 Lake Rd, Council Grove, KS, 66846	555.555.5555
2	1001	Brendan	NULL	Batchelor	1215 Haen Dr, Kaukauna, WI, 54130	972.664.1055
3	1002	Jack	E	Stauber	666 Heck Street, Hell, MI, 66666	555.555.5555
4	1003	Naoki	W	Urasawa	1117 W Stout St, Chetek, WI, 54728	715.925.1104
5	1004	Larry	G	David	26 Birchwood Dr, Port Jefferson Station, NY, 11776	631.473.6176
6	1005	Howard	NULL	Zinn	119 Palisade St, Dobbs Ferry, NY, 10522	914.693.6745

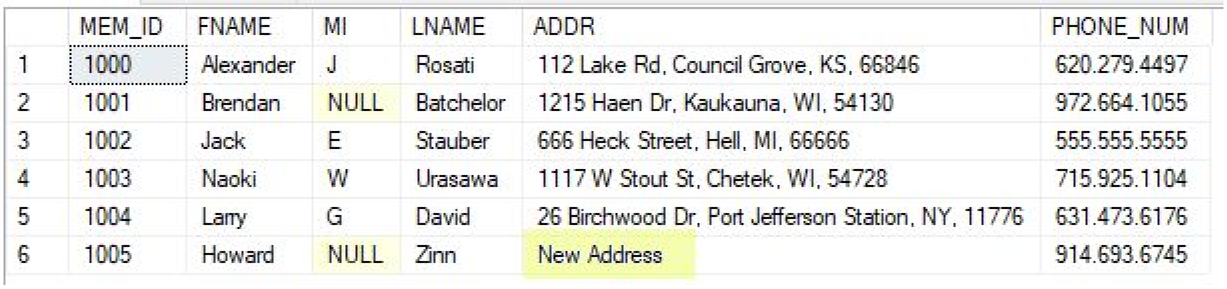
Statement 15

```
UPDATE MEMBER
SET ADDR = V1
WHERE MEM_ID = V2;
```

E.g.,

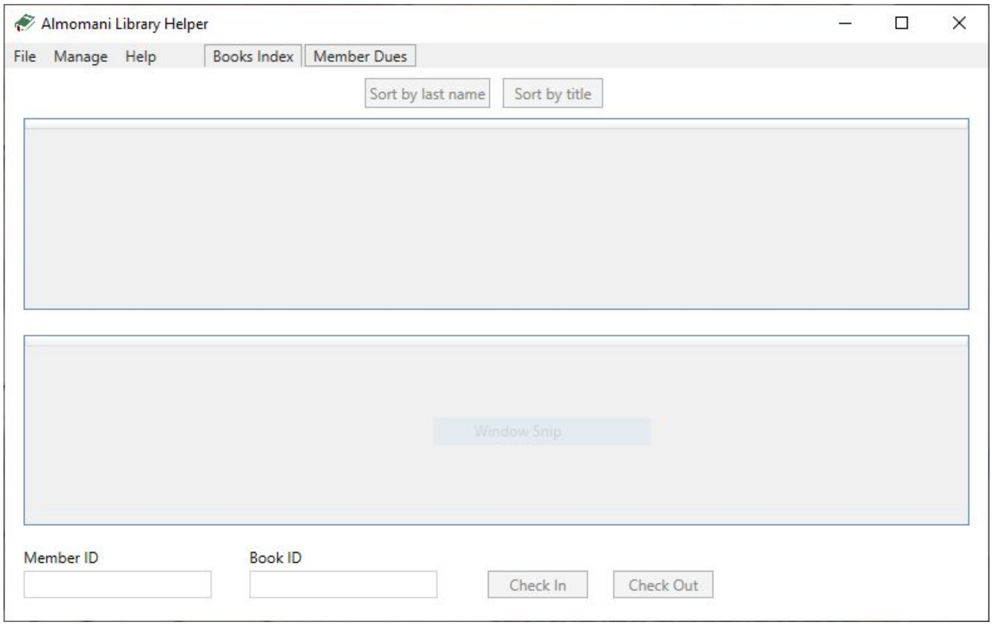
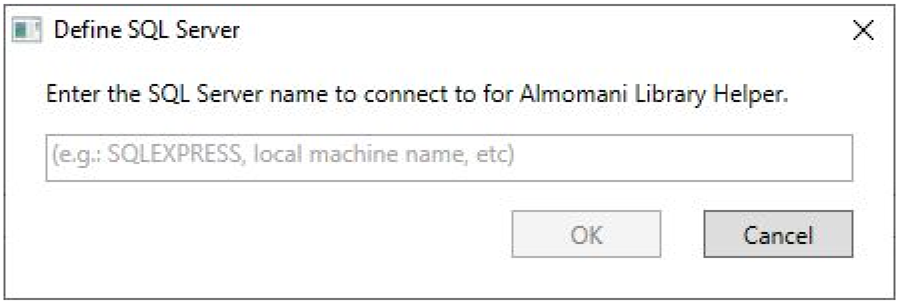
```
UPDATE MEMBER
SET ADDR = ‘New Address’
WHERE MEM_ID = 1005;
```

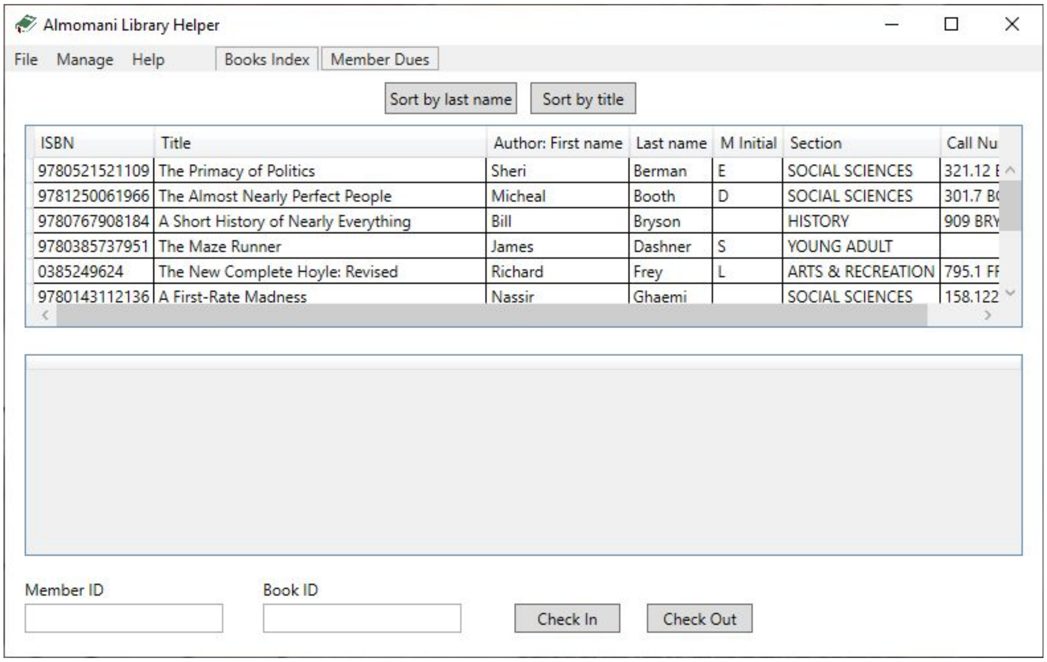
Results



	MEM_ID	FNAME	MI	LNAME	ADDR	PHONE_NUM
1	1000	Alexander	J	Rosati	112 Lake Rd, Council Grove, KS, 66846	620.279.4497
2	1001	Brendan	NULL	Batchelor	1215 Haen Dr, Kaukauna, WI, 54130	972.664.1055
3	1002	Jack	E	Stauber	666 Heck Street, Hell, MI, 66666	555.555.5555
4	1003	Naoki	W	Urasawa	1117 W Stout St, Chetek, WI, 54728	715.925.1104
5	1004	Larry	G	David	26 Birchwood Dr, Port Jefferson Station, NY, 11776	631.473.6176
6	1005	Howard	NULL	Zinn	New Address	914.693.6745

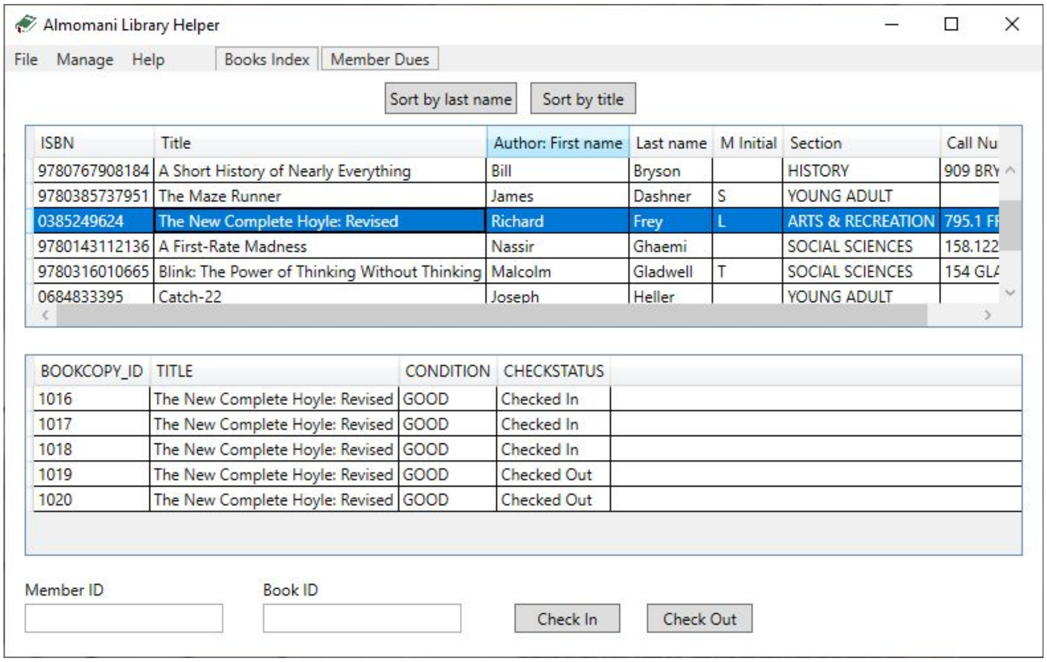
Screenshots of User Interface

 Almomani Library Helper File Manage Help Books Index Member Dues Sort by last name Sort by title Window Snip Member ID Book ID Check In Check Out	**Caption:** What the program looks like at startup.
 Define SQL Server Enter the SQL Server name to connect to for Almomani Library Helper. (e.g.: SQLEXPRESS, local machine name, etc) 	**Caption:** Prompt for SQL Server Name. Must give name in order to connect.



ISBN	Title	Author: First name	Last name	M Initial	Section	Call Nu
9780521521109	The Primacy of Politics	Sheri	Berman	E	SOCIAL SCIENCES	321.12 E
9781250061966	The Almost Nearly Perfect People	Micheal	Booth	D	SOCIAL SCIENCES	301.7 B
9780767908184	A Short History of Nearly Everything	Bill	Bryson		HISTORY	909 BRY
9780385737951	The Maze Runner	James	Dashner	S	YOUNG ADULT	
0385249624	The New Complete Hoyle: Revised	Richard	Frey	L	ARTS & RECREATION	795.1 FF
9780143112136	A First-Rate Madness	Nassir	Ghaemi		SOCIAL SCIENCES	158.122

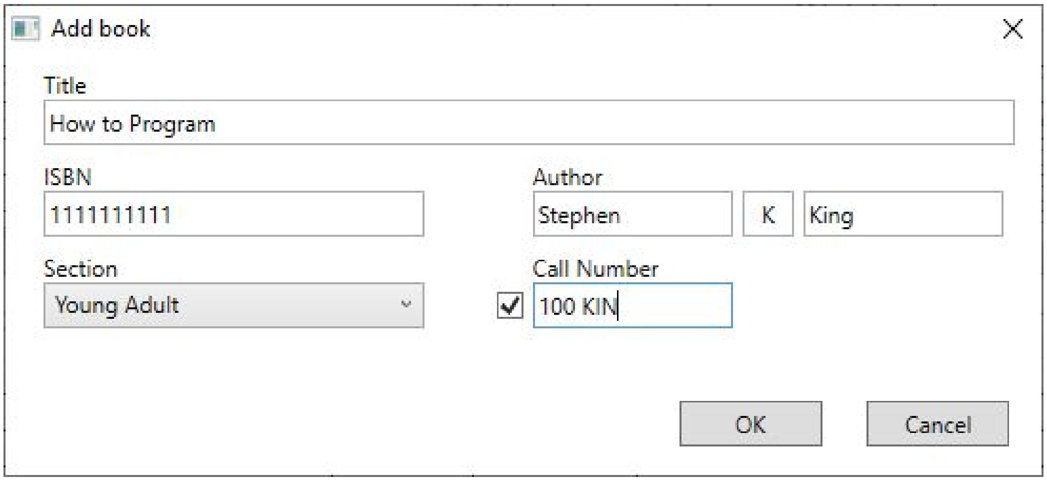
Caption:
Main screen with book data loaded.



ISBN	Title	Author: First name	Last name	M Initial	Section	Call Nu
9780767908184	A Short History of Nearly Everything	Bill	Bryson		HISTORY	909 BRY
9780385737951	The Maze Runner	James	Dashner	S	YOUNG ADULT	
0385249624	The New Complete Hoyle: Revised	Richard	Frey	L	ARTS & RECREATION	795.1 FF
9780143112136	A First-Rate Madness	Nassir	Ghaemi		SOCIAL SCIENCES	158.122
9780316010665	Blink: The Power of Thinking Without Thinking	Malcolm	Gladwell	T	SOCIAL SCIENCES	154 GLA
0684833395	Catch-22	Joseph	Heller		YOUNG ADULT	

BOOKCOPY_ID	TITLE	CONDITION	CHECKSTATUS
1016	The New Complete Hoyle: Revised	GOOD	Checked In
1017	The New Complete Hoyle: Revised	GOOD	Checked In
1018	The New Complete Hoyle: Revised	GOOD	Checked In
1019	The New Complete Hoyle: Revised	GOOD	Checked Out
1020	The New Complete Hoyle: Revised	GOOD	Checked Out

Caption:
Double clicked on the record that is highlighted. All copies of ‘The New Complete Hoyle: Revised’ are displayed below.



Title: How to Program

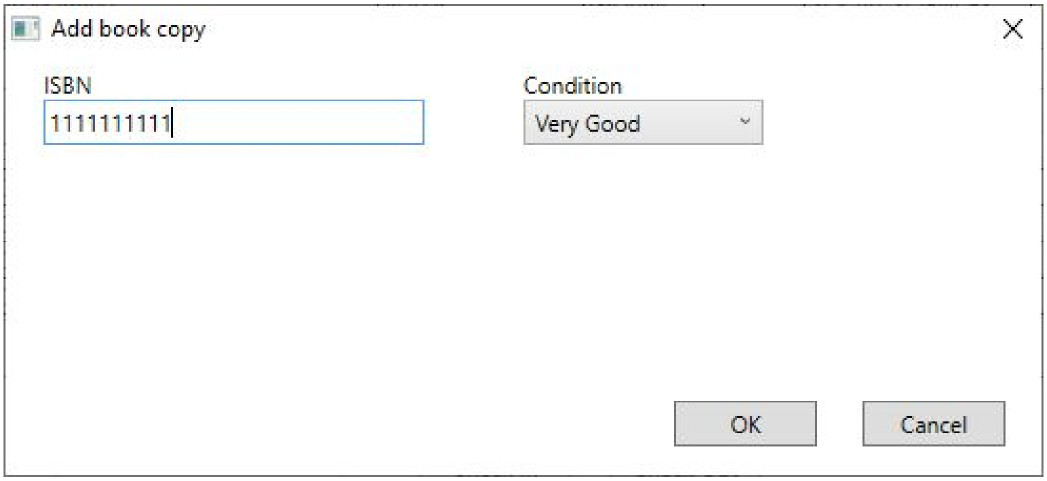
ISBN: 1111111111

Author: Stephen K King

Section: Young Adult

Call Number: ☑ 100 KIN

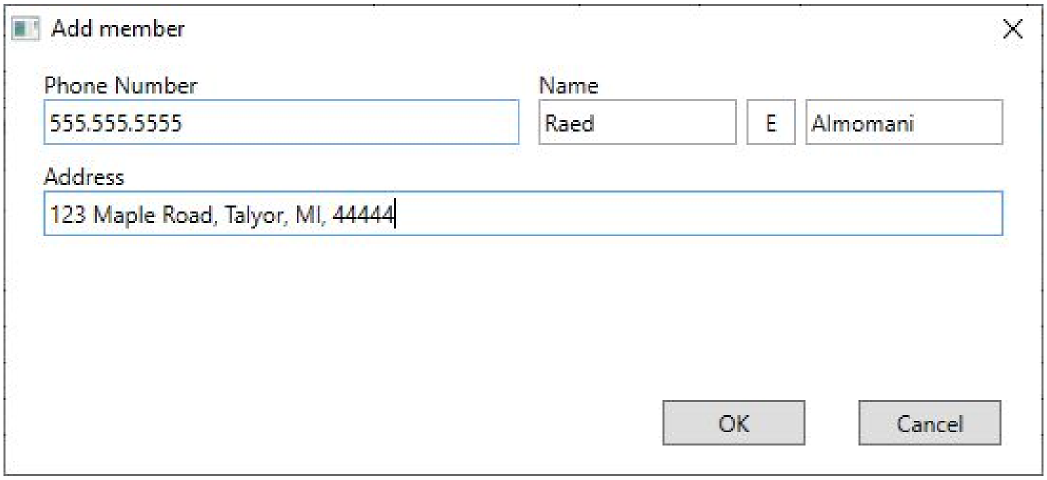
Caption:
Add book window with all fields filled out.



ISBN: 1111111111

Condition: Very Good

Caption:
Add book copy window filled out.

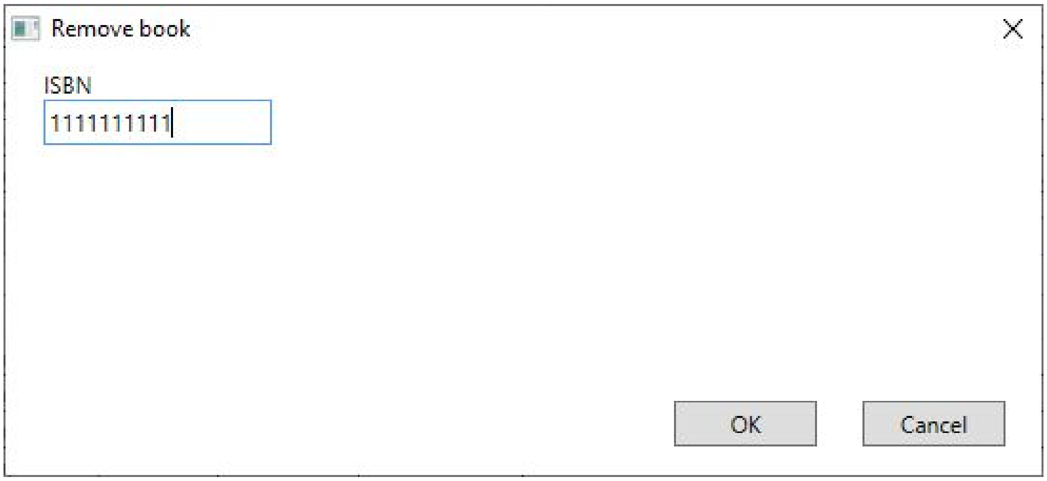
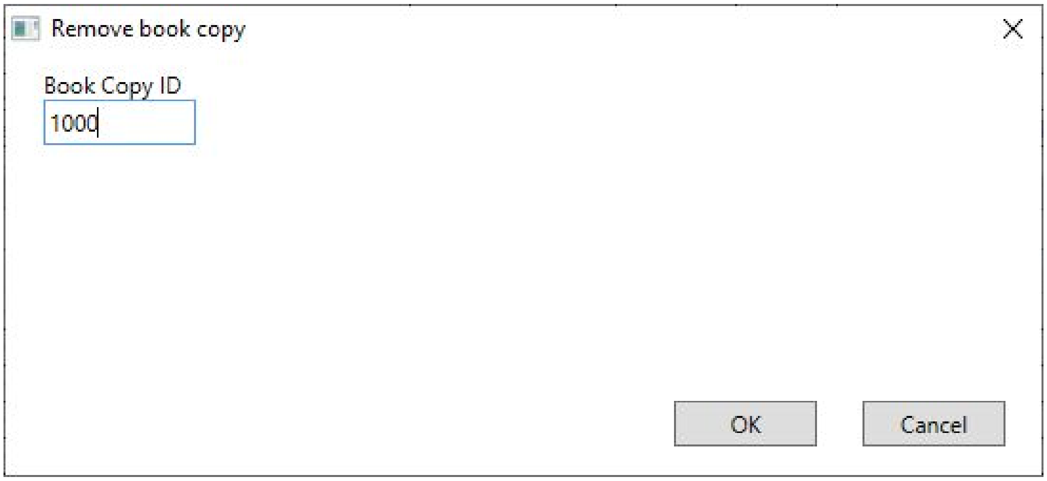
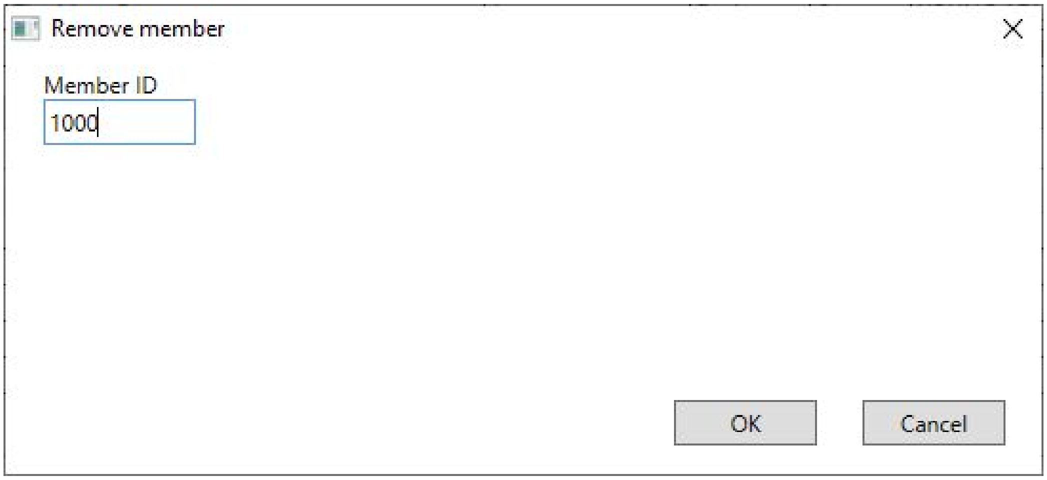


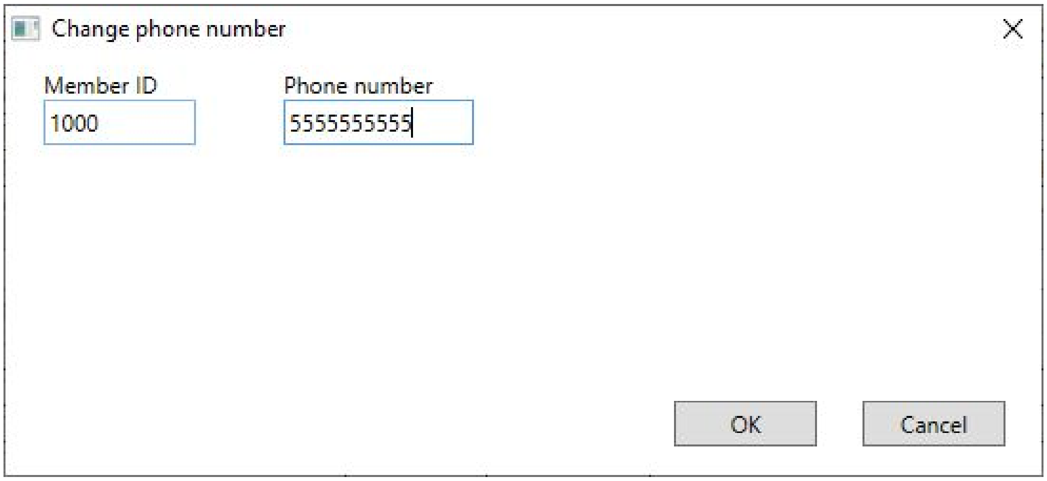
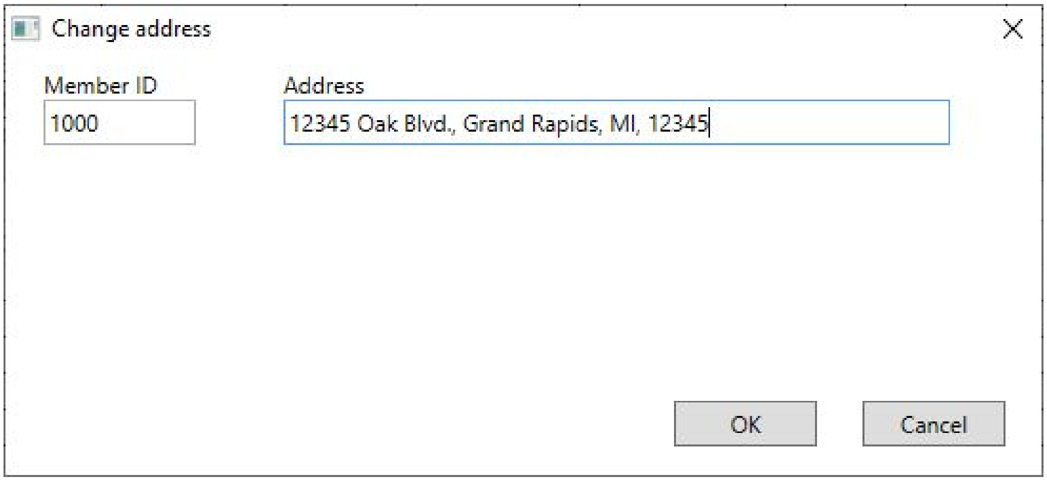
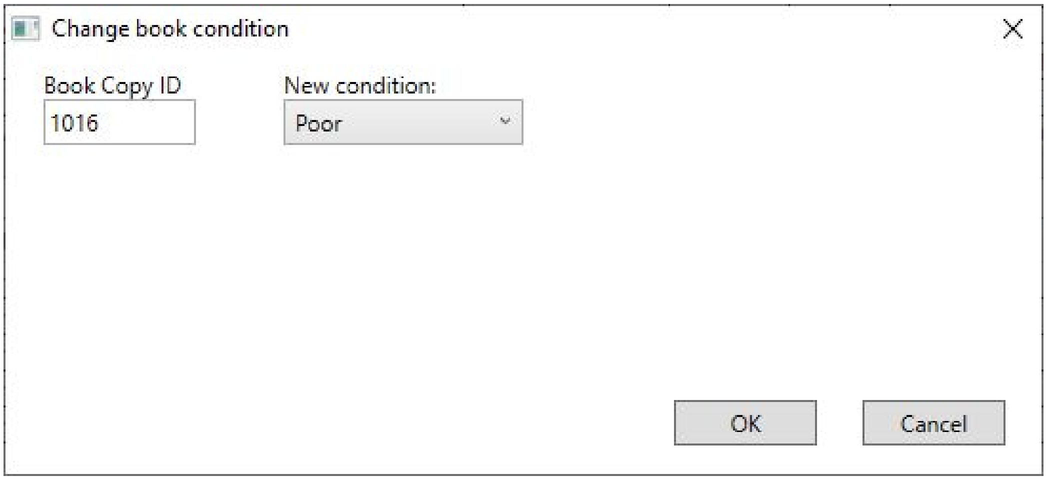
Phone Number: 555.555.5555

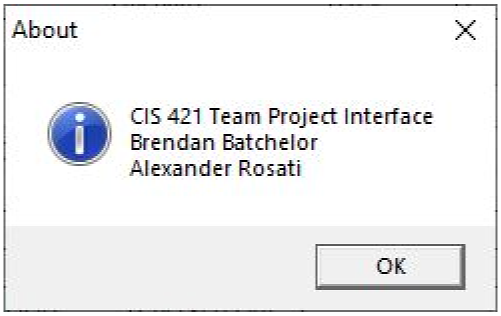
Name: Raed E Almomani

Address: 123 Maple Road, Talyor, MI, 44444

Caption:
Add member window with all fields filled out.

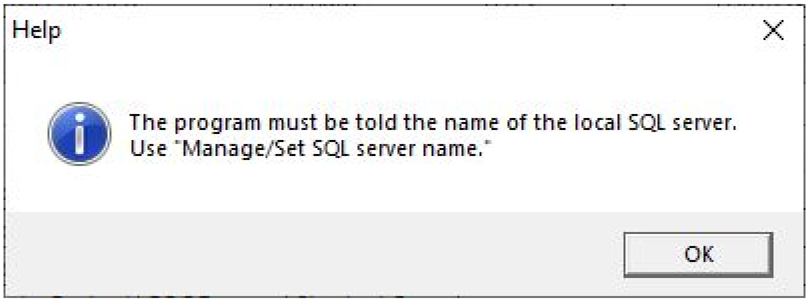
 ISBN 1111111111	**Caption:** Remove book window with all fields filled out.
 Book Copy ID 1000	**Caption:** Remove book copy window with field filled out.
 Member ID 1000	**Caption:** Remove member window with field filled out.

 Change phone number Member ID 1000 Phone number 5555555555 	**Caption:** Change phone number window with fields filled out.
 Change address Member ID 1000 Address 12345 Oak Blvd., Grand Rapids, MI, 12345 	**Caption:** Change address window with fields filled out.
 Change book condition Book Copy ID 1016 New condition: Poor 	**Caption:** Change book condition window with fields filled out.



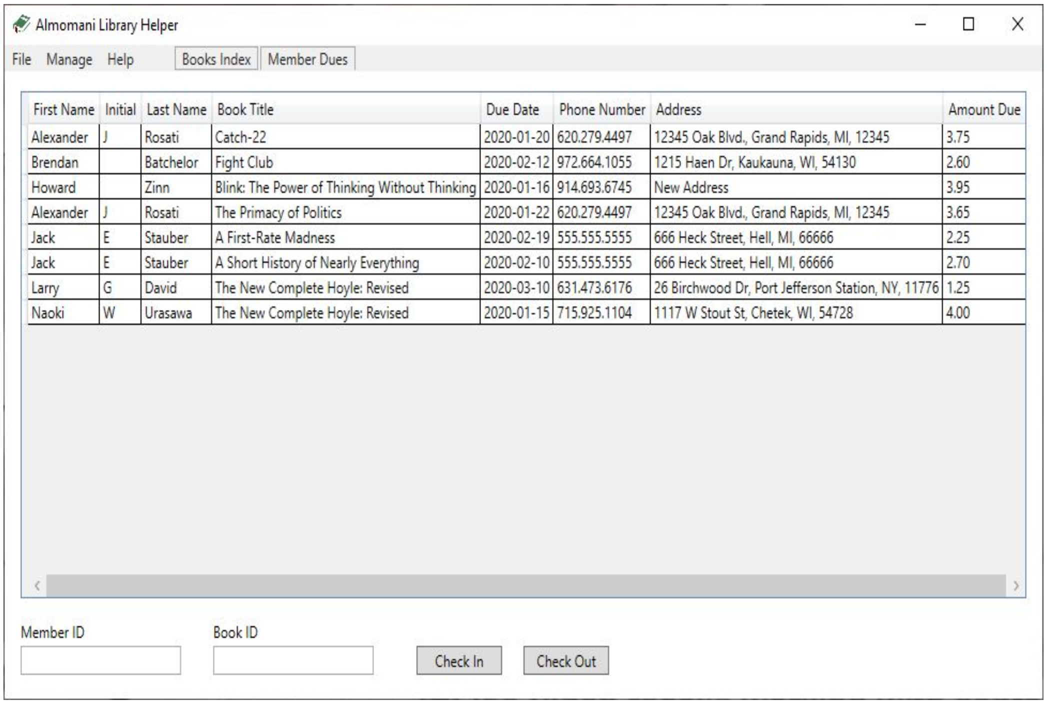
CIS 421 Team Project Interface
Brendan Batchelor
Alexander Rosati

Caption:
About window.



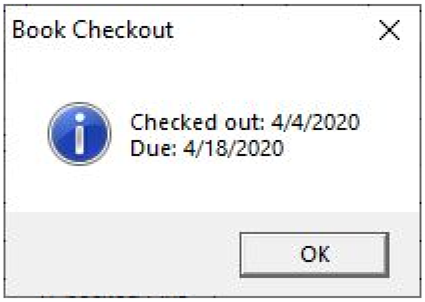
The program must be told the name of the local SQL server. Use "Manage/Set SQL server name."

Caption:
Window that appears when user click ‘Why is everything greyed out?’



First Name	Initial	Last Name	Book Title	Due Date	Phone Number	Address	Amount Due
Alexander	J	Rosati	Catch-22	2020-01-20	620.279.4497	12345 Oak Blvd., Grand Rapids, MI, 12345	3.75
Brendan		Batchelor	Fight Club	2020-02-12	972.664.1055	1215 Haen Dr, Kaukauna, WI, 54130	2.60
Howard		Zinn	Blink: The Power of Thinking Without Thinking	2020-01-16	914.693.6745	New Address	3.95
Alexander	J	Rosati	The Primacy of Politics	2020-01-22	620.279.4497	12345 Oak Blvd., Grand Rapids, MI, 12345	3.65
Jack	E	Stauber	A First-Rate Madness	2020-02-19	555.555.5555	666 Heck Street, Hell, MI, 66666	2.25
Jack	E	Stauber	A Short History of Nearly Everything	2020-02-10	555.555.5555	666 Heck Street, Hell, MI, 66666	2.70
Larry	G	David	The New Complete Hoyle: Revised	2020-03-10	631.473.6176	26 Birchwood Dr, Port Jefferson Station, NY, 11776	1.25
Naoki	W	Urasawa	The New Complete Hoyle: Revised	2020-01-15	715.925.1104	1117 W Stout St, Chetek, WI, 54728	4.00

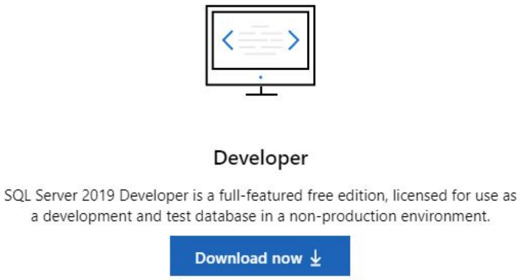
Caption:
Interface displaying all late fees.

 Book Checkout Checked out: 4/4/2020 Due: 4/18/2020 	**Caption:** Window showing when the book was checked out and when it is due by.

Setting Everything Up

Before I explain everything you need to do to run our program, I would like to share this link for the third time. This is a link to our demo. It is about 15 mins long. If I do not show off enough in the video, follow the instructions below to run our code. I will warn you, however, that this is not going to be fun. If you do not already have SQL Server installed on your machine, it will take you about 30 mins to install that alone. Without further ado, let's get into it.

Step 1. Install SQL Server. Go to this link. Go down to where it says developer and click 'Download Now'.



Developer

SQL Server 2019 Developer is a full-featured free edition, licensed for use as a development and test database in a non-production environment.

Go with the basic version. Go through the installation process and install SQL Server 2019 Developer.

Step 2. Install SQL Server Management Studio (SSMS). This is a client for SQL Server. You will need it to send SQL statements to SQL Server. Go to this link. Click 'Download SQL Server Management Studio (SSMS)'.

Step 3. Download source code from GitHub. Click this link for source code. Click 'Clone or download' and then 'Download ZIP'.

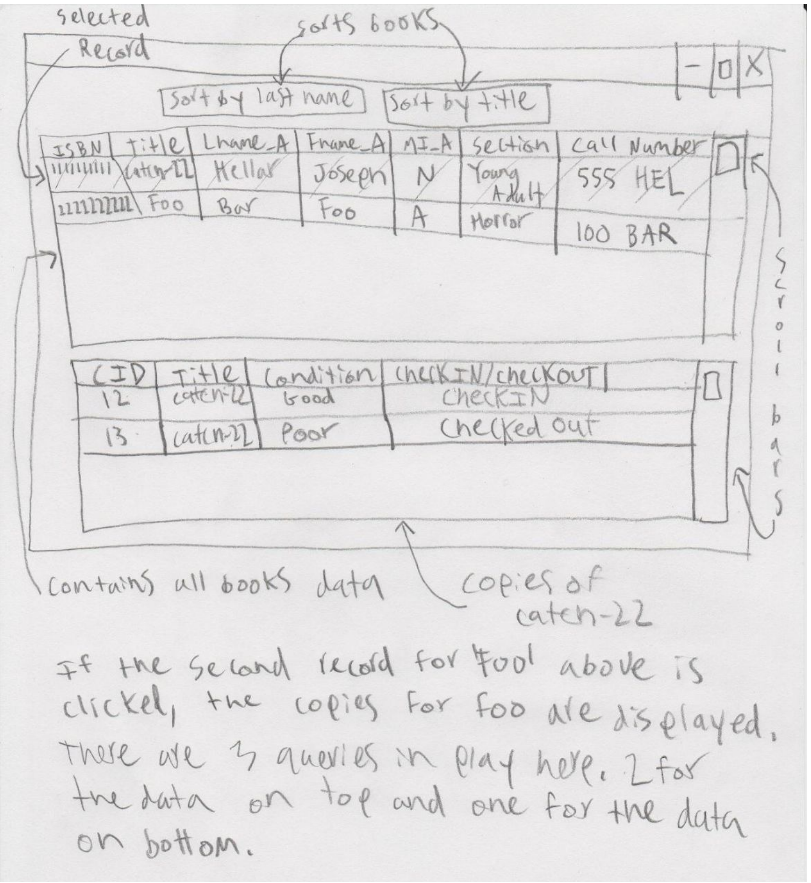
Step 4. Launch SQL Server Management Studio. Sever type is ‘Database Engine’, server name is ‘.’, and authentication is ‘Windows Authentication’. Click connect. Click ‘Open File’. Navigate to our source code. Locate the folder named ‘SQL’. Double click it. Click ‘CREATE_DATABASE.sql’ and click open. Click the window that opens. Do Ctrl-A. Click ‘Execute’. The database has been created. You can close the .sql file.

Step 5. Time to load the data. To do this, click ‘Open File’ again. Once again navigate to the SQL folder. Click ‘INSERT_SAMPLE_DATA.sql’. Click open. At the top left of SSMS, there will be a drop down list that currently contains ‘master’. Click the down arrow. Select ‘ALMOMANI_PUBLIC_LIBRARY’. Click inside the .sql file you opened. Do Ctrl-A. Click ‘Execute’.

Step 6. Launching the program. You can now close SSMS. Open the folder containing our source code. Navigate as follows: 421Interface-master > WpfApp1 > WpfApp1 > bin > Debug. Run ‘WpfApp1.exe’. The program should work. Alternatively, you could open the solution in Visual Studios.

Appendix

This section contains miscellaneous items we thought were worth sharing, in no particular order.



ISBN	Title	Lname_A	Fname_A	MI_A	Section	Call Number
1111111111	catch-22	Hellar	Joseph	N	Young Adult	555 HEL
2222222222	Foo	Bar	Foo	A	Horror	100 BAR

CID	Title	Condition	CheckIN/checkOUT
12	catch-22	Good	CheckIN
13	catch-22	Poor	Checked out

If the second record for 'Foo' above is clickel, the copies for foo are displayed. There are 3 queries in play here. 2 for the data on top and one for the data on bottom.

Figure 1. Sketch of Interface.

Data Sanitation

We checked the following to make sure all data in the database was valid. These validations were done by the interface.

- ISBN field in BOOK
  - All characters must be digits.
  - Must be of length either 10 or 13.
- SECTION field in BOOK
  - Must be one of the fifteen sections listed above.

    - Will be stored in all caps.
- CALL# field in BOOK
    - Input must be two words
    - First word must contain only decimal digits and periods
    - First and last character cannot be period.
    - Second word must be only letters.
    - Second word must be either two or three characters
    - Cannot have two periods in a row.
- CONDITION field in BOOK_COPY
    - Must be either VERY GOOD, GOOD, DECENT, or POOR.
    - Stored in all caps.
- PHONE# field in MEMBER
    - Phone numbers in the US have the following format
        - NXX-NXX-XXXX
        - Where N = 2-9 and X = 0-9
        - Doesn’t necessarily have to have hyphens.
    - Entered data must fit format.
    - MUST be stored in the following format: NXX.NXX.XXX