1. Write appropriate SQL DDL statements for declaring the LIBRARY relational database schema. (21 points):

CREATE TABLE LIBRARY\_BRANCH(

Branch\_id char(10) primary key,

Branch\_name varchar(20) not null,

Address varchar(30));

CREATE TABLE PUBLISHER(

Name varchar(20) primary key,

Address varchar(30),

Phone char(11),

CONSTRAINT check\_phone\_number

CHECK (Phone ~\* '[0-9]{11}'));

-- Note, I chose char for card\_no, so cards starting with zeros are value (ie 00482)

CREATE TABLE BORROWER(

Card\_no char(10) primary key,

Name varchar(30) not null,

Address varchar(30) not null,

Phone char(11),

CONSTRAINT check\_phone\_number

CHECK (Phone ~\* '[0-9]{11}'));

CREATE TABLE BOOK(

Book\_id char(15) primary key,

Title varchar(30) not null,

Publisher\_name varchar(20),

FOREIGN KEY (Publisher\_name) references PUBLISHER);

CREATE TABLE BOOK\_LOANS(

Book\_id char(15),

Branch\_id char(10),

Card\_no char(10),

Date\_out date not null,

Due\_date date not null,

PRIMARY KEY (Book\_id, Branch\_id, Card\_no),

FOREIGN KEY (Book\_id) references BOOK,

FOREIGN KEY (Branch\_id) references LIBRARY\_BRANCH,

FOREIGN KEY (Card\_no) references BORROWER);

CREATE TABLE BOOK\_COPIES(

Book\_id char(15),

Branch\_id char(10),

No\_of\_copies smallint,

PRIMARY KEY (Book\_id, Branch\_id),

FOREIGN KEY (Book\_id) references BOOK,

FOREIGN KEY (Branch\_id) references LIBRARY\_BRANCH);

CREATE TABLE BOOK\_AUTHORS(

Book\_id char(15),  
Author\_name varchar(30) not null,  
PRIMARY KEY (Book\_id, Author\_name),  
FOREIGN KEY (Book\_id) references BOOK)

1. Write the appropriate SQL statements to populate the BOOK and PUBLISHER relations with 3 records in both relations. (12 points)

INSERT INTO PUBLISHER VALUES ('Hermit Publishing', '45 Windsor Way', '18025555890');

INSERT INTO PUBLISHER VALUES ('Super Quality Text', '1 Textbook Lane', '19875556743');

INSERT INTO PUBLISHER VALUES ('Jefferson Books', '76 Gazo Street', '18005558585');  
INSERT INTO BOOK VALUES ('37BAF3629FC5CA6', 'How Bikes are Made', 'Hermit Publishing');

INSERT INTO BOOK VALUES ('123456789012345', 'Coffee: An Autobiography', 'Super Quality Text');

INSERT INTO BOOK VALUES ('098765432109876', 'The Cat in the Tophat', 'Jefferson Books');

1. Write the appropriate SQL statement(s) to remove the records from the book table but leave the table structure intact. (5 points)

DELETE FROM BOOK;

1. Write SELECT statements to do the following: (4 points each)
   1. List all of the Publishers names. There should not be any duplicates.

SELECT DISTINCT name FROM publisher;

* 1. The names of the borrowers who currently have books from the library.

SELECT DISTINCT name   
 FROM borrower, book\_loans  
 WHERE borrower.card\_no = book\_loans.card\_no;

* 1. List all of the books published by ‘Bookshelf’ that are on loan to card 43576

-- Note, I used a char for card\_no, so cards starting with zeros are value (ie 00482)  
-- This could also have been implemented with an int or small int if this was not desired.

SELECT DISTINCT title

FROM book, publisher, borrower, book\_loans

WHERE publisher.name = 'Bookshelf'

AND borrower.card\_no = '43576'

AND book.publisher\_name = publisher.name

AND book\_loans.book\_id = book.book\_id

AND book\_loans.card\_no = borrower.card\_no;