PROGRAM 3

DESCRIPTION:

Consider the following database of student enrollment in courses & books adopted for each course.

- STUDENT (regno: string, name: string, major: string, bdate:date)
- COURSE (course #:int, cname:string, dept:string)
- ENROLL (regno:string, course#:int, sem:int, marks:int)
- BOOK_ADOPTION (course# :int, sem:int, book-ISBN:int)
- TEXT (book-ISBN:int, book-title:string, publisher:string, author:string)

Queries:

1. Create the above tables by properly specifying the primary keys and the foreign keys.
2. Enter at least five tuples for each relation.
3. Demonstrate how you add a new text book to the database and make this book be adopted by some department.
4. Produce a list of text books (include Course #, Book-ISBN, Book-title) in the alphabetical order for courses offered by the 'CS' department that use more than two books.
5. List any department that has all its adopted books published by a specific publisher.
6. Generate suitable reports.
7. Create suitable front end for querying and displaying the results.

Create:

```
mysql> CREATE DATABASE books;
Query OK, 1 row affected (0.01 sec)

mysql> USE books;
Database changed
mysql> CREATE TABLE student(
     regno VARCHAR(15),
     name VARCHAR(20),
     major VARCHAR(20),
     bdate DATE,
     PRIMARY KEY (regno) );
Query OK, 0 rows affected (0.12 sec)
```

```
mysql> DESC student;
+-------+-------------+------+-----+---------+-------+
| Field | Type        | Null | Key | Default | Extra |
+-------+-------------+------+-----+---------+-------+
| regno | varchar(15) | NO   | PRI |         |       |
| name  | varchar(20) | YES  |     | NULL    |       |
| major | varchar(20) | YES  |     | NULL    |       |
| bdate | date        | YES  |     | NULL    |       |
+-------+-------------+------+-----+---------+-------+
4 rows in set (0.01 sec)

mysql> CREATE TABLE course(
     courseno INT,
     cname VARCHAR(20),
     dept VARCHAR(20),
     PRIMARY KEY (courseno) );
Query OK, 0 rows affected (0.12 sec)

mysql> DESC course;
+----------+-------------+------+-----+---------+-------+
| Field    | Type        | Null | Key | Default | Extra |
+----------+-------------+------+-----+---------+-------+
| courseno | int(11)     | NO   | PRI | 0       |       |
| cname    | varchar(20) | YES  |     | NULL    |       |
| dept     | varchar(20) | YES  |     | NULL    |       |
+----------+-------------+------+-----+---------+-------+
3 rows in set (0.00 sec)

mysql> CREATE TABLE enroll(
     regno VARCHAR(15),
     courseno INT,
     sem INT(3),
     marks INT(4),
     PRIMARY KEY (regno,courseno),
     FOREIGN KEY (regno) REFERENCES student (regno),
     FOREIGN KEY (courseno) REFERENCES course (courseno) );
Query OK, 0 rows affected (0.19 sec)

mysql> DESC enroll;
+----------+-------------+------+-----+---------+-------+
| Field    | Type        | Null | Key | Default | Extra |
+----------+-------------+------+-----+---------+-------+
| regno    | varchar(15) | NO   | PRI |         |       |
| courseno | int(11)     | NO   | PRI | 0       |       |
| sem      | int(3)      | YES  |     | NULL    |       |
| marks    | int(4)      | YES  |     | NULL    |       |
+----------+-------------+------+-----+---------+-------+
4 rows in set (0.00 sec)

mysql> CREATE TABLE text(
     book_isbn INT(5),
     book_title VARCHAR(20),
     publisher VARCHAR(20),
     author VARCHAR(20),
     PRIMARY KEY (book_isbn) );
Query OK, 0 rows affected (0.15 sec)
```

```
mysql> DESC text;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| book_isbn  | int(5)      | NO   | PRI | 0       |       |
| book_title | varchar(20) | YES  |     | NULL    |       |
| publisher  | varchar(20) | YES  |     | NULL    |       |
| author     | varchar(20) | YES  |     | NULL    |       |
+------------+-------------+------+-----+---------+-------+
4 rows in set (0.00 sec)

mysql> CREATE TABLE book_adoption(
     courseno INT,
     sem INT(3),
     book_isbn INT(5),
     PRIMARY KEY (courseno,book_isbn),
     FOREIGN KEY (courseno) REFERENCES course (courseno),
     FOREIGN KEY (book_isbn) REFERENCES text(book_isbn) );
Query OK, 0 rows affected (0.17 sec)

mysql> DESC book_adoption;
+-----------+---------+------+-----+---------+-------+
| Field     | Type    | Null | Key | Default | Extra |
+-----------+---------+------+-----+---------+-------+
| courseno  | int(11) | NO   | PRI | 0       |       |
| sem       | int(3)  | YES  |     | NULL    |       |
| book_isbn | int(5)  | NO   | PRI | 0       |       |
+-----------+---------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

Insertion:

```
mysql> INSERT INTO student (regno,name,major,bdate) VALUES ('1pe11cs001','a','sr',19931230);
Query OK, 1 row affected (0.05 sec)

mysql> INSERT INTO student (regno,name,major,bdate) VALUES
     ('1pe11cs002','b','sr','19930924'),
     ('1pe11cs003','c','sr','19931127'),
     ('1pe11cs004','d','sr','19930413'),
     ('1pe11cs005','e','jr','19940824');


Query OK, 4 rows affected (0.07 sec)
Records: 4  Duplicates: 0  Warnings: 0


mysql> SELECT * FROM student;
+------------+------+-------+------------+
| regno      | name | major | bdate      |
+------------+------+-------+------------+
| 1pe11cs001 | a    | sr    | 1993-12-30 |
| 1pe11cs002 | b    | sr    | 1993-09-24 |
| 1pe11cs003 | c    | sr    | 1993-11-27 |
| 1pe11cs004 | d    | sr    | 1993-04-13 |
| 1pe11cs005 | e    | jr    | 1994-08-24 |
+------------+------+-------+------------+
5 rows in set (0.01 sec)
```

```
mysql> INSERT INTO course VALUES (111,'OS','CSE'),
     (112,'EC','CSE'),
     (113,'SS','ISE'),
     (114,'DBMS','CSE'),
     (115,'SIGNALS','ECE');


Query OK, 5 rows affected (0.06 sec)
Records: 5  Duplicates: 0  Warnings: 0


mysql> SELECT * FROM course;
+----------+---------+------+
| courseno | cname   | dept |
+----------+---------+------+
|      111 | OS      | CSE  |
|      112 | EC      | CSE  |
|      113 | SS      | ISE  |
|      114 | DBMS    | CSE  |
|      115 | SIGNALS | ECE  |
+----------+---------+------+
5 rows in set (0.00 sec)

mysql> INSERT INTO text VALUES (book_isbn,book_title,publisher,author)
     (10,'DATABASE SYSTEMS','PEARSON','SCHIELD'),
     (900,'OPERATING SYS','PEARSON','LELAND'),
     (901,'CIRCUITS','HALL INDIA','BOB'),
     (902,'SYSTEM SOFTWARE','PETERSON','JACOB'),
     (903,'SCHEDULING','PEARSON','PATIL'),
     (904,'DATABASE SYSTEMS','PEARSON','JACOB'),
     (905,'DATABASE MANAGER','PEARSON','BOB'),
     (906,'SIGNALS','HALL INDIA','SUMIT');
Query OK, 8 rows affected (0.06 sec)
Records: 8  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM text;
+-----------+------------------+------------+---------+
| book_isbn | book_title       | publisher  | author  |
+-----------+------------------+------------+---------+
|        10 | DATABASE SYSTEMS | PEARSON    | SCHIELD |
|       900 | OPERATING SYS    | PEARSON    | LELAND  |
|       901 | CIRCUITS         | HALL INDIA | BOB     |
|       902 | SYSTEM SOFTWARE  | PETERSON   | JACOB   |
|       903 | SCHEDULING       | PEARSON    | PATIL   |
|       904 | DATABASE SYSTEMS | PEARSON    | JACOB   |
|       905 | DATABASE MANAGER | PEARSON    | BOB     |
|       906 | SIGNALS          | HALL INDIA | SUMIT   |
+-----------+------------------+------------+---------+
8 rows in set (0.00 sec)

mysql> INSERT INTO enroll (regno,courseno,sem,marks) VALUES ('1pe11cs001',115,3,100),
     ('1pe11cs002',114,5,100),
     ('1pe11cs003',113,5,100),
     ('1pe11cs004',111,5,100),
     ('1pe11cs005',112,3,100);
Query OK, 5 rows affected (0.08 sec)
Records: 5  Duplicates: 0  Warnings: 0
```

```
mysql> SELECT * FROM enroll;
+------------+----------+------+-------+
| regno      | courseno | sem  | marks |
+------------+----------+------+-------+
| 1pe11cs001 |      115 |    3 |   100 |
| 1pe11cs002 |      114 |    5 |   100 |
| 1pe11cs003 |      113 |    5 |   100 |
| 1pe11cs004 |      111 |    5 |   100 |
| 1pe11cs005 |      112 |    3 |   100 |
+------------+----------+------+-------+
5 rows in set (0.00 sec)

mysql> INSERT INTO book_adoption (courseno,sem,book_isbn) VALUES
(111,5,900),
(111,5,903),
(111,5,904),
(112,3,901),
(113,3,10),
(114,5,905),
(113,5,902),
(115,3,906);
Query OK, 8 rows affected (0.06 sec)
Records: 8  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM book_adoption;
+----------+------+-----------+
| courseno | sem  | book_isbn |
+----------+------+-----------+
|      111 |    5 |       900 |
|      111 |    5 |       903 |
|      111 |    5 |       904 |
|      112 |    3 |       901 |
|      113 |    3 |        10 |
|      113 |    5 |       902 |
|      114 |    5 |       905 |
|      115 |    3 |       906 |
+----------+------+-----------+
8 rows in set (0.00 sec).
```

Queries:

4. Produce a list of text books (include Course #, Book-ISBN, Book-title) in the alphabetical order for courses offered by the 'CS' department that use more than two books.

```
mysql> SELECT c.courseno,t.book_isbn,t.book_title
     FROM course c,book_adoption ba,text t
     WHERE c.courseno=ba.courseno
     AND ba.book_isbn=t.book_isbn
     AND c.dept='CSE'
     AND 2<(
     SELECT COUNT(book_isbn)
     FROM book_adoption b
     WHERE c.courseno=b.courseno)
     ORDER BY t.book_title;
+----------+-----------+------------------+
| courseno | book_isbn | book_title       |
+----------+-----------+------------------+
|      111 |       904 | DATABASE SYSTEMS |
|      111 |       900 | OPERATING SYS    |
|      111 |       903 | SCHEDULING       |
+----------+-----------+------------------+
3 rows in set (0.01 sec)
```

5. List any department that has all its adopted books published by a specific publisher.

```
mysql> SELECT DISTINCT c.dept
     FROM course c
     WHERE c.dept IN
     ( SELECT c.dept
     FROM course c,book_adoption b,text t
     WHERE c.courseno=b.courseno
     AND t.book_isbn=b.book_isbn
     AND t.publisher='PEARSON')
     AND c.dept NOT IN
     (SELECT c.dept
     FROM course c,book_adoption b,text t
     WHERE c.courseno=b.courseno
     AND t.book_isbn=b.book_isbn
     AND t.publisher != 'PEARSON');
+------+
| dept |
+------+
| CSE  |
+------+
1 row in set (0.00 sec).
```