

Library Management Application Database System

SQL codes for database creation:

1)

```
drop table DEPARTMENT cascade constraints;  
create table DEPARTMENT(  
    departmentID number(8),  
    departmentName varchar2(30),  
    primary key (departmentID));
```

2)

```
drop table USER1 cascade constraints;  
create table USER1(  
    cardID number(6),  
    userName varchar2(30),  
    Sex char(1),  
    State varchar2(30),  
    departmentID number(8),  
    primary key (cardID),  
    foreign key (departmentID) references DEPARTMENT);
```

3)

```
drop table BORROW1RETURN cascade constraints;  
create table BORROW1RETURN(  
    bookID number(10),  
    cardID number(6),  
    borrowDate number(8),  
    returnDate number(8),  
    borrowDays number(5),  
    borrowNumber number(5),  
    primary key (bookID),  
    foreign key (cardID) references USER1);
```

4)

```
drop table BOOK cascade constraints;  
create table BOOK(  
    bookID number(10),  
    Publish varchar2(50),  
    bookName varchar2(50),  
    Author varchar2(30),  
    ISBN number(13),  
    primary key (bookID),  
    foreign key (bookID) references BORROW1RETURN);
```

INSERT INTO statements for populating the tables:

Insert into DEPARTMENT values (11111111, 'Jerry');
Insert into DEPARTMENT values (22222222, 'Rainie');
Insert into DEPARTMENT values (33333333, 'Bruce');
Insert into DEPARTMENT values (44444444, 'Jackie');
Insert into DEPARTMENT values (55555555, 'Taylor');
Insert into DEPARTMENT values (66666666, 'Jay');

Insert into USER1 values (333333, 'Ruiyang', 'M', 'available', 11111111);
Insert into USER1 values (444444, 'Sam', 'M', 'available', 33333333);
Insert into USER1 values (111111, 'Grace', 'F', 'available', 22222222);
Insert into USER1 values (222222, 'Cindy', 'F', 'available', 44444444);
Insert into USER1 values (555555, 'Hans', 'M', 'available', 22222222);
Insert into USER1 values (666666, 'Dina', 'F', 'available', 33333333);

Insert into BORROW1RETURN values (1234567890, 333333, 20210320, 20210330, 10, 1);
Insert into BORROW1RETURN values (2345678901, 333333, 20210320, 20210410, 20, 3);
Insert into BORROW1RETURN values (6789012345, 555555, 20210330, 20210410, 10, 1);
Insert into BORROW1RETURN values (3456789012, 111111, 20210120, 20210130, 10, 2);
Insert into BORROW1RETURN values (4567890123, 222222, 20201220, 20201225, 5, 1);
Insert into BORROW1RETURN values (5678901234, 666666, 20201015, 20201025, 10, 1);

Insert into BOOK values (1234567890, 'Addison', 'Fundamentals', 'Ramez', 9780136086208);
Insert into BOOK values (2345678901, 'HarperOne', 'Religions', 'Novak', 9780060663421);
Insert into BOOK values (3456789012, 'AABC', 'History', 'Mary', 9780273648174);
Insert into BOOK values (4567890123, 'SKDJ', 'Math', 'Jackson', 9780982736154);
Insert into BOOK values (5678901234, 'OJD', 'English', 'Tom', 9780382758499);
Insert into BOOK values (6789012345, 'PFJLS', 'Piano', 'Cris', 9780091596843);

SQL codes for sample queries:

1) Query the CardID, gender and state of the user Ruiyang.

```
SELECT u.CARDID, u.SEX, u.STATE  
FROM USER1 u  
WHERE u.USERNAME = 'Ruiyang';
```

2) Query the BookID of all the books that the user with CardID 666666 has already borrowed.

```
SELECT r.BOOKID  
FROM BORROW1RETURN r  
WHERE r.CARDID = '666666';
```

3) Query the ISBN of the book named Piano.

```
SELECT b.ISBN  
FROM BOOK b  
WHERE b.BOOKNAME = 'Piano';
```

4) Query the DepartmentID of the administrator whose name is Jay.

```
SELECT d.DEPARTMENTID  
FROM DEPARTMENT d  
WHERE d.DEPARTMENTNAME = 'Jay';
```

5) Query the gender of all the people who borrowed the book with BookID 4567890123.

```
SELECT u.SEX  
FROM USER1 u, BORROW1RETURN r  
WHERE r.BOOKID = '4567890123' AND r.CARDID = u.CARDID;
```

6) Query the CardID of all users who have borrowed books whose author is Tom.

```
SELECT r.CARDID  
FROM BORROW1RETURN r, BOOK b  
WHERE b.AUTHOR = 'Tom' AND r.BOOKID = b.BOOKID;
```

7) Query the names of all users who have borrowed books whose publisher is OJD.

```
SELECT u.USERNAME  
FROM BORROW1RETURN r, BOOK b, USER1 u  
WHERE b.PUBLISH = 'OJD' AND b.BOOKID = r.BOOKID AND r.CARDID = u.CARDID;
```

8) Query the names and DepartmentIDs of the administrators of all users who have borrowed books whose ISBN is 9780273648174.

```
SELECT d.DEPARTMENTNAME, d.DEPARTMENTID  
FROM DEPARTMENT d, BORROW1RETURN r, BOOK b, USER1 u  
WHERE b.ISBN = '9780273648174' AND b.BOOKID = r.BOOKID AND r.CARDID =  
u.CARDID AND u.DEPARTMENTID = d.DEPARTMENTID;
```