**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;