Example 1

EMPLOYEE

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000	333445555	5
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000	888665555	5
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000	987654321	4
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000	888665555	4
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000	333445555	5
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000	333445555	5
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000	987654321	4
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000	NULL	1

DEPARTMENT

Dname	Dnumber	Mgr_ssn	Mgr_start_date
Research	5	333445555	1988-05-22
Administration	4	987654321	1995-01-01
Headquarters	1	888665555	1981-06-19

WORKS_ON

Essn	Pno	Hours
123456789	1	32.5
123456789	2	7.5
666884444	3	40.0
453453453	1	20.0
453453453	2	20.0
333445555	2	10.0
333445555	3	10.0
333445555	10	10.0
333445555	20	10.0
999887777	30	30.0
999887777	10	10.0
987987987	10	35.0
987987987	30	5.0
987654321	30	20.0
987654321	20	15.0
888665555	20	NULL

DEPT_LOCATIONS

Dnumber	Dlocation
1	Houston
4	Stafford
5	Bellaire
5	Sugarland
5	Houston

DEPENDENT

Essn	Dependent_name	Sex	Bdate	Relationship
333445555	Alice	F	1986-04-05	Daughter
333445555	Theodore	M	1983-10-25	Son
333445555	Joy	F	1958-05-03	Spouse
987654321	Abner	M	1942-02-28	Spouse
123456789	Michael	M	1988-01-04	Son
123456789	Alice	F	1988-12-30	Daughter
123456789	Elizabeth	F	1967-05-05	Spouse

PROJECT

Pname	Pnumber	Plocation	Dnum
ProductX	1	Bellaire	5
ProductY	2	Sugarland	5
ProductZ	3	Houston	5
Computerization	10	Stafford	4
Reorganization	20	Houston	1
Newbenefits	30	Stafford	4

Get Full name and ssn of managers of the departments in which at least one of the employees work less than 40 hours.

```
select concat(Fname, ' ', Lname) as "Full Name", Ssn ,
Dnumber , Dname
from employee e , department
where Ssn in
            (select mgr_ssn
            from department d
            where Dnumber in
                        (select distinct Dno
                        from employee e
                        where Ssn in
                                    (select Essn
                                    from works_on wo
                                    group by Essn
                                    having sum(Hours) < 40)
                        )
            );
```

SQ3

SQ2

SQ1

EMPLOYEE

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000	333445555	5
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000	888665555	5
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000	987654321	4
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000	888665555	4	SQ2
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000	333445555	5
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000	333445555	5
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000	987654321	4
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000	NULL	1

WORKS_ON

Essn	Pno	Hours
123456789	1	32.5
123456789	2	7.5
666884444	3	40.0
453453453	1	20.0
453453453	2	20.0
333445555	2	10.0
333445555	3	10.0
333445555	10	10.0
333445555	20	10.0
999887777	30	30.0
999887777	10	10.0
987987987	10	35.0
987987987	30	5.0
987654321	30	20.0	SQ1
987654321	20	15.0
888665555	20	NULL

DEPARTMENT

Dname	Dnumber	Mgr_ssn	Mgr_start_date	
Research	5	333445555	1988-05-22	
Administration	4	987654321	1995-01-01	SQ3
Headquarters	1	888665555	1981-06-19	

DEPT_LOCATIONS

Dnumber	Dlocation
1	Houston
4	Stafford
5	Bellaire
5	Sugarland
5	Houston

DEPENDENT

Essn	Dependent_name	Sex	Bdate	Relationship
333445555	Alice	F	1986-04-05	Daughter
333445555	Theodore	M	1983-10-25	Son
333445555	Joy	F	1958-05-03	Spouse
987654321	Abner	M	1942-02-28	Spouse
123456789	Michael	M	1988-01-04	Son
123456789	Alice	F	1988-12-30	Daughter
123456789	Elizabeth	F	1967-05-05	Spouse

PROJECT

Pname	Pnumber	Plocation	Dnum
ProductX	1	Bellaire	5
ProductY	2	Sugarland	5
ProductZ	3	Houston	5
Computerization	10	Stafford	4
Reorganization	20	Houston	1
Newbenefits	30	Stafford	4

Get Full name and ssn of managers of the departments in which at least one of the employees work less than 40 hours. - ***an alternate approach***

```
SELECT DISTINCT
    CONCAT(mgr.Fname, ' ', mgr.Minit, ' ', mgr.Lname) AS "Full
Name",
    mgr.Ssn AS "SSN",
    dept.Dnumber AS "Dept. Id",
    dept.Dname AS "Dept. Name"
FROM
    Department dept
JOIN
    Employee mgr ON dept.Mgr_ssn = mgr.Ssn
WHERE
    dept.Dnumber IN (
        SELECT emp.Dno
        FROM Employee emp
        JOIN Works_on w ON emp.Ssn = w.Essn
        GROUP BY emp.Dno
        HAVING MAX(w.Hours) < 40
    );
```

Get Full name, ssn, number of employees that an employee is supervising for all the direct supervisors in ascending order.
Output – Full name, ssn, Number of employees

(select concat(Fname," ", Lname) as "Full Name", Ssn, count,
from

(select e.*, Dname from department d join employee e
on
e.Dno = d.Dnumber) e2

SQ1

join

(select distinct Super_ssn, count(*) as cnt from employee e
where
Super_ssn is not null
group by Super_ssn) as temp

SQ2

SQ3

on temp.Super_ssn = e2.ssn
order by count);

EMPLOYEE

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000	333445555	5
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000	888665555	5
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000	987654321	4
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000	888665555	4
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000	333445555	5
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000	333445555	5
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000	987654321	4
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000	NULL	1

SQ3

SQ2

WORKS_ON

Essn	Pno	Hours
123456789	1	32.5
123456789	2	7.5
666884444	3	40.0
453453453	1	20.0
453453453	2	20.0
333445555	2	10.0
333445555	3	10.0
333445555	10	10.0
333445555	20	10.0
999887777	30	30.0
999887777	10	10.0
987987987	10	35.0
987987987	30	5.0
987654321	30	20.0
987654321	20	15.0
888665555	20	NULL

DEPARTMENT

Dname	Dnumber	Mgr_ssn	Mgr_start_date
Research	5	333445555	1988-05-22
Administration	4	987654321	1995-01-01
Headquarters	1	888665555	1981-06-19

SQ1

DEPENDENT

Essn	Dependent_name	Sex	Bdate	Relationship
333445555	Alice	F	1986-04-05	Daughter
333445555	Theodore	M	1983-10-25	Son
333445555	Joy	F	1958-05-03	Spouse
987654321	Abner	M	1942-02-28	Spouse
123456789	Michael	M	1988-01-04	Son
123456789	Alice	F	1988-12-30	Daughter
123456789	Elizabeth	F	1967-05-05	Spouse

DEPT_LOCATIONS

Dnumber	Dlocation
1	Houston
4	Stafford
5	Bellaire
5	Sugarland
5	Houston

PROJECT

Pname	Pnumber	Plocation	Dnum
ProductX	1	Bellaire	5
ProductY	2	Sugarland	5
ProductZ	3	Houston	5
Computerization	10	Stafford	4
Reorganization	20	Houston	1
Newbenefits	30	Stafford	4

Get the number of projects on which the manager of department which controls productY is working.

```
select Essn, count(*)
from works_on wo
where
Essn in
        (select Mgr_ssn from department d
        where Dnumber in
            (select Dnum from project p
            where Pname ="ProductY"))
    GROUP BY Essn;
```

SQ3

SQ2

SQ1

EMPLOYEE

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000	333445555	5
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000	888665555	5
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000	987654321	4
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000	888665555	4
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000	333445555	5
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000	333445555	5
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000	987654321	4
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000	NULL	1

DEPARTMENT

Dname	Dnumber	Mgr_ssn	Mgr_start_date	
Research	5	333445555	1988-05-22	②
Administration	4	987654321	1995-01-01	
Headquarters	1	888665555	1981-06-19	

DEPT_LOCATIONS

Dnumber	Dlocation
1	Houston
4	Stafford
5	Bellaire
5	Sugarland
5	Houston

DEPENDENT

Essn	Dependent_name	Sex	Bdate	Relationship
333445555	Alice	F	1986-04-05	Daughter
333445555	Theodore	M	1983-10-25	Son
333445555	Joy	F	1958-05-03	Spouse
987654321	Abner	M	1942-02-28	Spouse
123456789	Michael	M	1988-01-04	Son
123456789	Alice	F	1988-12-30	Daughter
123456789	Elizabeth	F	1967-05-05	Spouse

WORKS_ON

③

Essn	Pno	Hours
123456789	1	32.5
123456789	2	7.5
666884444	3	40.0
453453453	1	20.0
453453453	2	20.0
333445555	2	10.0
333445555	3	10.0
333445555	10	10.0
333445555	20	10.0
999887777	30	30.0
999887777	10	10.0
987987987	10	35.0
987987987	30	5.0
987654321	30	20.0
987654321	20	15.0
888665555	20	NULL

PROJECT

①

Pname	Pnumber	Plocation	Dnum
ProductX	1	Bellaire	5
ProductY	2	Sugarland	5
ProductZ	3	Houston	5
Computerization	10	Stafford	4
Reorganization	20	Houston	1
Newbenefits	30	Stafford	4

Number of locations for the departments whose managers have at least 2 female dependents.

```
SELECT d.dnumber, d.dname, COUNT(dl.dlocation) AS
"Number of locations"
FROM department d
INNER JOIN (
    SELECT essn
    FROM dependent
    WHERE sex = 'F'                        SQ1
    GROUP BY essn
    HAVING COUNT(Dependent_name) > 1
) de ON d.Mgr_ssn = de.essn
INNER JOIN dept_locations dl ON dl.dnumber = d.dnumber
GROUP BY d.dnumber, d.dname;                SQ3
```

SQ2

EMPLOYEE

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000	333445555	5
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000	888665555	5
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000	987654321	4
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000	888665555	4
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000	333445555	5
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000	333445555	5
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000	987654321	4
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000	NULL	1

DEPARTMENT

Dname	Dnumber	Mgr_ssn	Mgr_start_date
Research	5	333445555	1988-05-22
Administration	4	987654321	1995-01-01
Headquarters	1	888665555	1981-06-19

DEPT_LOCATIONS

Dnumber	Dlocation
1	Houston
4	Stafford
5	Bellaire
5	Sugarland
5	Houston

DEPENDENT

Essn	Dependent_name	Sex	Bdate	Relationship
333445555	Alice	F	1986-04-05	Daughter
333445555	Theodore	M	1983-10-25	Son
333445555	Joy	F	1958-05-03	Spouse
987654321	Abner	M	1942-02-28	Spouse
123456789	Michael	M	1988-01-04	Son
123456789	Alice	F	1988-12-30	Daughter
123456789	Elizabeth	F	1967-05-05	Spouse

WORKS_ON

Essn	Pno	Hours
123456789	1	32.5
123456789	2	7.5
666884444	3	40.0
453453453	1	20.0
453453453	2	20.0
333445555	2	10.0
333445555	3	10.0
333445555	10	10.0
333445555	20	10.0
999887777	30	30.0
999887777	10	10.0
987987987	10	35.0
987987987	30	5.0
987654321	30	20.0
987654321	20	15.0
888665555	20	NULL

PROJECT

Pname	Pnumber	Plocation	Dnum
ProductX	1	Bellaire	5
ProductY	2	Sugarland	5
ProductZ	3	Houston	5
Computerization	10	Stafford	4
Reorganization	20	Houston	1
Newbenefits	30	Stafford	4

No. of dependents for the managers whose departments are located at at least 2 different locations.

```sql
SELECT d.Essn, COUNT(*) AS DependentCount
FROM dependent d
WHERE d.Essn IN (
    SELECT Mgr_ssn
    FROM department d
    WHERE Dnumber IN (
        SELECT Dnumber
        FROM dept_locations dl
        GROUP BY Dnumber
        HAVING COUNT(*) >= 2
    )
)
GROUP BY d.Essn;
```

SQ3

SQ2

SQ1

EMPLOYEE

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000	333445555	5
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000	888665555	5
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000	987654321	4
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000	888665555	4
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000	333445555	5
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000	333445555	5
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000	987654321	4
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000	NULL	1

DEPARTMENT

Dname	Dnumber	Mgr_ssn	Mgr_start_date
Research	② 5	333445555	1988-05-22
Administration	4	987654321	1995-01-01
Headquarters	1	888665555	1981-06-19

DEPT_LOCATIONS

Dnumber	Dlocation
1	Houston
4	Stafford
5	Bellaire
5	① Sugarland
5	Houston

DEPENDENT

Essn	Dependent_name	Sex	Bdate	Relationship
③ 333445555	Alice	F	1986-04-05	Daughter
333445555	Theodore	M	1983-10-25	Son
333445555	Joy	F	1958-05-03	Spouse
987654321	Abner	M	1942-02-28	Spouse
123456789	Michael	M	1988-01-04	Son
123456789	Alice	F	1988-12-30	Daughter
123456789	Elizabeth	F	1967-05-05	Spouse

WORKS_ON

Essn	Pno	Hours
123456789	1	32.5
123456789	2	7.5
666884444	3	40.0
453453453	1	20.0
453453453	2	20.0
333445555	2	10.0
333445555	3	10.0
333445555	10	10.0
333445555	20	10.0
999887777	30	30.0
999887777	10	10.0
987987987	10	35.0
987987987	30	5.0
987654321	30	20.0
987654321	20	15.0
888665555	20	NULL

PROJECT

Pname	Pnumber	Plocation	Dnum
ProductX	1	Bellaire	5
ProductY	2	Sugarland	5
ProductZ	3	Houston	5
Computerization	10	Stafford	4
Reorganization	20	Houston	1
Newbenefits	30	Stafford	4

Example 2

SSDLab.authors

author_id	int
author_name	varchar(30)

SSDLab.books

book_id	int
title	varchar(100)
author_id	int
genre	varchar(20)

SSDLab.issued_users

user_id	int
user_name	varchar(20)
book_id	int
date_issued	date

authors

author_id	author_name
1	Arundhati Roy
2	Chetan Bhagat
3	Amish Tripathi
4	Jhumpa Lahiri
5	Vikram Seth
6	Ruskin Bond
7	Ravinder Singh
8	Anita Desai
9	Salman Rushdie
10	Shashi Tharoor
11	NULL
12	Aravind Adiga

books

book_id	title	author_id	genre
1	The God of Small Things	1	Fiction
2	Revolution 2020	2	Romance
3	Half Girlfriend	2	Romance
4	The Secret of the Nagas	3	Mythology
5	The Oath of the Vayuputras	3	Mythology
6	Interpreter of Maladies	4	Fiction
7	Unaccustomed Earth	4	Fiction
8	Beastly Tales from Here and There	5	Fantasy
9	Rusty and the Magic Mountain	6	Children
10	The Cherry Tree	6	Children
11	This Love That Feels Right	17	Romance
12	NULL	8	Fiction
13	In Custody	8	Fiction
14	Haroun and the Sea of Stories	9	Fantasy
15	The Satanic Verses	9	Fiction
16	Riot: A Love Story	10	Fiction
17	Why I Am a Hindu	10	Non-Fiction
18	The White Tiger	11	Fiction

issued records

user_id	4	7	5	11	17	2	6	2	6	3
user_name	Priya	Kavya	Neha	Arjun	Aryan	Simran	Vikrant	Simran	Vikrant	Karan
book_id	1	1	2	2	2	3	3	4	4	5
date_issued	15-07-2023	20-07-2023	02-08-2023	24-07-2023	03-08-2023	17-08-2023	18-07-2023	02-08-2023	15-08-2023	12-07-2023

user_id	9	7	8	11	12	11	1	14	13	15
user_name	Isha	Kavya	Aarav	Arjun	Vivan	Arjun	Aditi	Anika	Aanya	Kabir
book_id	5	6	6	6	7	7	8	8	9	11
date_issued	11-08-2023	09-08-2023	22-07-2023	25-07-2023	05-08-2023	03-08-2023	10-08-2023	01-08-2023	08-08-2023	26-07-2023

user_id	16	1	6	16	17	18	15	10	7	15
user_name	Sanjay	Aditi	Vikrant	Sanjay	Aryan	Riya	Kabir	Tanvi	Kavya	Kabir
book_id	11	12	12	13	13	14	14	15	15	16
date_issued	25-07-2023	05-08-2023	01-08-2023	27-03-2023	08-08-2023	20-07-2023	30-07-2023	25-07-2023	06-08-2023	28-07-2023

user_id	9	18	15	12	13	14
user_name	Isha	Riya	Kabir	Vivan	Aanya	Anika
book_id	16	17	17	18	28	28
date_issued	10-08-2023	09-07-2023	18-07-2023	08-08-2023	12-08-2023	20-07-2023

Retrieve a list of all users along with the titles and authors of the books they have borrowed.
Filter out records where title and/or author name is NULL.
Print table with column names **(user_name, title, author_name)**.

```sql
select user_name, title, author_name
from
ssdLab.issued_users as i,
SSDLab.books as b,
SSDLab.authors as a
where
i.book_id= b.book_id
and
b.author_id= a.author_id
and
title is not null
and
author_name is not null;
```

```sql
SELECT
    iu.user_name,
    b.title,
    a.author_name
FROM
    issued_users iu
JOIN
    books b ON iu.book_id = b.book_id
JOIN
    authors a ON b.author_id = a.author_id
WHERE
    b.title IS NOT NULL AND a.author_name IS NOT NULL;
```

Count total issued users in each genre along with the genre name.
Print table with column names **(genre, total_user_count)**.

```
select genre, count(user_id)
from
SSDLab.books as b, SSDLab.issued_users as i
where
i.book_id=b.book_id
group by genre;
```

```
SELECT
    b.genre,
    COUNT(DISTINCT iu.user_id) AS total_user_count
FROM
    books b
JOIN
    issued_users iu ON b.book_id = iu.book_id
GROUP BY
    b.genre;
```

Get the list of all book names, the author names and the latest (most recent) date_issued for that book.
Print table with column names (book_name, author_name, recent_date_issued).

```
select
title as book_name, author_name,
max(date_issued) as recent_date_issued
from
SSDLab.books as b,
SSDLab.authors as a,
SSDLab.issued_users as i
    where i.book_id= b.book_id and
b.author_id= a.author_id
    group by title,author_name;
```

```
SELECT
    b.title AS book_name,
    a.author_name,
    MAX(iu.date_issued) AS recent_date_issued
FROM
    books b
JOIN
    authors a ON b.author_id = a.author_id
LEFT JOIN
    issued_users iu ON b.book_id = iu.book_id
GROUP BY
    b.title, a.author_name;
```

Retrieve the top three authors who have written the most books, along with the total count of books each of these authors has written.
Only display the records if the book count is greater than or equal to 2.
Display this in decreasing order of book count.
In cases where authors have the same book count, their names should also be arranged in descending alphabetical order.
Print table with column names (author_name, book_count).

```sql
SELECT
  author_name,
  book_count
FROM (
  SELECT
    a.author_name,
    COUNT(b.book_id) AS book_count
  FROM
    authors a,
    books b
  WHERE
    a.author_id = b.author_id
  GROUP BY
    a.author_name
  HAVING
    COUNT(b.book_id) >= 2
) AS author_book_counts
ORDER BY
  book_count DESC, author_name DESC
LIMIT 3;
```

```sql
SELECT
  a.author_name,
  COUNT(b.book_id) AS book_count
FROM
  authors a
JOIN
  books b ON a.author_id = b.author_id
GROUP BY
  a.author_name
HAVING
  COUNT(b.book_id) >= 2
ORDER BY
  book_count DESC, a.author_name DESC
LIMIT 3;
```
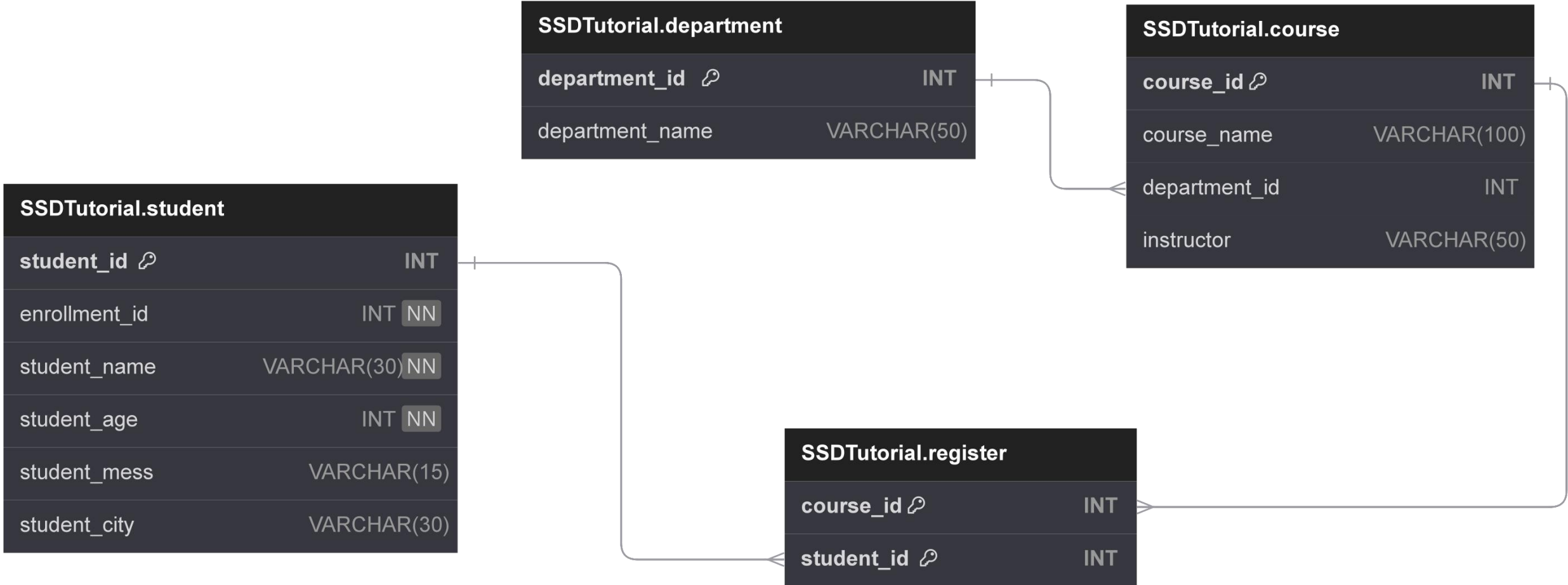
Identify genres that users have not yet explored (issued any books from) and recommend those genres to them.
Print the table with column names (user_name, genre).

```
SELECT
   DISTINCT iu.user_name,
   g.genre
FROM
   (SELECT DISTINCT genre FROM books) AS g,
   (SELECT DISTINCT user_name FROM
issued_users) AS iu
WHERE
   NOT EXISTS (
      SELECT 1
      FROM books b
      WHERE b.genre = g.genre
       AND b.book_id IN (
         SELECT book_id
         FROM issued_users
         WHERE user_name = iu.user_name
      )
   );
```

```
SELECT
   DISTINCT iu.user_name,
   g.genre
FROM
   (SELECT DISTINCT genre FROM books) AS g
CROSS JOIN
   (SELECT DISTINCT user_name FROM issued_users) AS iu
WHERE
   g.genre NOT IN (
      SELECT DISTINCT b.genre
      FROM books b
      JOIN issued_users iu2 ON b.book_id = iu2.book_id
      WHERE iu2.user_name = iu.user_name
   );
```

Example 3

student_id	enrollment_id	student_name	student_age	student_city
1	1001	Anil	20	Mumbai
2	1002	Ajay	21	Agra
3	1003	Arun	18	Pune
4	1004	Ankita	20	Mumbai
5	1005	Ananya	23	Delhi
6	1006	Ananya	25	Vizag
7	1007	TEST	25	Hyd
8	1008	John	25	TEST

department_id	department_name
1	Cognitive Science
2	Software Engg
3	Computer Vision

course_id	student_id	register_date
101	1	2023-08-17
101	2	2023-08-01
101	3	2023-08-20
102	2	2023-08-13
102	4	2023-08-04
103	1	2023-08-15
103	4	2023-08-19
103	5	2023-08-19
104	5	2023-08-26

course_id	course_name	department_id	instructor
101	Introduction to SE	2	Sunil
102	Topics in SE	2	Shaun
103	Introduction to Cognition	3	Shalini
104	Mind Theory	1	Simran
105	Introduction to ML	2	Mukul

Find the student name who are enrolled to at least course.

```sql
SELECT student_name
FROM SSDTutorial.student
WHERE student_id IN (SELECT student_id FROM SSDTutorial.register);
```

Find the course name that have at least one student enrolled.

```sql
SELECT course_name
FROM SSDTutorial.course
WHERE course_id IN (SELECT course_id FROM SSDTutorial.register);
```

List the department name that offer courses with more than 2 students enrolled.

```sql
SELECT department_name
FROM SSDTutorial.department
WHERE department_id IN (
    SELECT department_id
    FROM SSDTutorial.course
    WHERE course_id IN (
        SELECT course_id
        FROM SSDTutorial.register
        GROUP BY course_id
        HAVING COUNT(*) > 2
    )
);
```

Retrieve the student names and their ages who are enrolled in courses offered by the 'Software Engg' department.

```
SELECT student_name, student_age
FROM SSDTutorial.student
WHERE student_id IN (
    SELECT student_id
    FROM SSDTutorial.register
    WHERE course_id IN (
        SELECT course_id
        FROM SSDTutorial.course
        WHERE department_id = (
            SELECT department_id
            FROM SSDTutorial.department
            WHERE department_name = 'Software Engg'
        )
    )
);
```

Retrieve the names of students and their enrolled courses.

```
SELECT student_name, course_name
FROM SSDTutorial.student
INNER JOIN SSDTutorial.register ON student.student_id = register.student_id
INNER JOIN SSDTutorial.course ON register.course_id = course.course_id;
```

List the courses and their instructors offered by the 'Cognitive Science' department.

```sql
SELECT course_name, instructor
FROM SSDTutorial.course
INNER JOIN SSDTutorial.department ON course.department_id = department.department_id
WHERE department.department_name = 'Cognitive Science';
```

Retrieve a list of all students and their enrolled courses (including those without courses).

```sql
SELECT student_name, course_name
FROM SSDTutorial.student
LEFT JOIN SSDTutorial.register ON student.student_id = register.student_id
LEFT JOIN SSDTutorial.course ON register.course_id = course.course_id
```

Retrieve a list of courses and their enrolled students (including those without students).

```sql
SELECT course_name, student_name
FROM SSDTutorial.course
RIGHT JOIN SSDTutorial.register ON course.course_id = register.course_id
RIGHT JOIN SSDTutorial.student ON register.student_id = student.student_id;
```

List all students and their enrolled courses, showing both enrolled students and courses without students.

```sql
SELECT student_name, course_name
FROM SSDTutorial.student
FULL OUTER JOIN SSDTutorial.register ON student.student_id = register.student_id
FULL OUTER JOIN SSDTutorial.course ON register.course_id = course.course_id
```