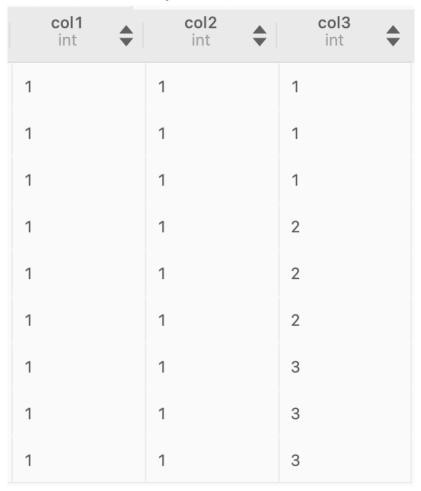1.

```
1    CREATE TABLE Question1 (
2    col1 INT,
3    col2 INT,
4    col3 INT,
5    col4 INT
6    );
7
8    INSERT INTO Question1 (col1, col2, col3, col4)
9    VALUES
10   (1, 1, 1, 0),
11   (1, 1, 1, 0),
12   (1, 1, 1, 0),
13   (1, 1, 2, 1),
14   (1, 1, 2, 0),
15   (1, 1, 2, 0),
16   (1, 1, 3, 0),
17   (1, 1, 3, 0),
18   (1, 1, 3, 0);
19
20   SELECT * FROM Question1 LIMIT 2;
```

col1 int	col2 int	col3 int	col4 int
1	1	1	0
1	1	1	0

a. SELECT col1, col2, col3 FROM Question1;

col1 int	col2 int	col3 int
1	1	1
1	1	1
1	1	1
1	1	2
1	1	2
1	1	2
1	1	3
1	1	3
1	1	3

b. SELECT SUM(col1) AS Sum_Col1, SUM(col2) AS Sum_Col2, SUM(col3) AS Sum_Col3, SUM(col4) AS Sum_Col4 FROM Question1;

Sum_Col1 newdecimal	Sum_Col2 newdecimal	Sum_Col3 newdecimal	Sum_Col4 newdecimal
9	9	18	1

c.   CREATE VIEW q1view AS SELECT col1, col2, col3 FROM Question1;

col1 int	col2 int	col3 int
1	1	1
1	1	1
1	1	1
1	1	2
1	1	2
1	1	2
1	1	3
1	1	3
1	1	3

d. INSERT INTO Question1 (col1, col2, col3, col4) VALUES (4, 5, 6, 0), (5, 7, -3, 0), (6, 4, -8, 0);

col1 int	col2 int	col3 int
1	1	1
1	1	1
1	1	1
1	1	2
1	1	2
1	1	2
1	1	3
1	1	3
1	1	3
4	5	6
5	7	-3
6	4	-8

e. SELECT * FROM q1view WHERE col1 < 0 OR col2 < 0 OR col3 < 0;

col1 int	col2 int	col3 int
5	7	-3
6	4	-8

f. SELECT * FROM q1view ORDER BY (col1 + col2 + col3) DESC;

col1 int	col2 int	col3 int
4	5	6
5	7	-3
1	1	3
1	1	3
1	1	3
1	1	2
1	1	2
1	1	2
1	1	1
1	1	1
1	1	1
6	4	-8

2. .

    a. SELECT E.Fname, E.Lname, D.Dname, W.Hours FROM EMPLOYEE E JOIN
        DEPARTMENT D ON E.Dno = D.Dnumber JOIN WORKS_ON W ON E.Ssn =
        W.Essn;

Fname varchar	Lname varchar	Dname varchar	Hours newdecimal
John	Smith	Research	32.5
John	Smith	Research	7.5
Franklin	Wong	Research	10.0
Franklin	Wong	Research	10.0
Franklin	Wong	Research	10.0
Franklin	Wong	Research	10.0
Joyce	English	Research	20.0
Joyce	English	Research	20.0

b. SELECT E.Fname, E.Lname, DW.Dnumber, DW.Hours FROM EMPLOYEE E INNER JOIN (SELECT D.Dnumber, W.Hours FROM DEPARTMENT D LEFT OUTER JOIN WORKS_ON W ON D.Dnumber = W.Pno) AS DW ON E.Dno = DW.Dnumber;

Fname varchar	Lname varchar	Dnumber int	Hours newdecimal
John	Smith	5	0.0
Franklin	Wong	5	0.0
Joyce	English	5	0.0
Ramesh	Narayan	5	0.0
James	Borg	1	32.5

c. SELECT E.Fname, E.Lname, DW.Dnumber, DW.Hours, PW.Pname FROM EMPLOYEE E INNER JOIN (SELECT D.Dnumber, W.Hours FROM DEPARTMENT D LEFT OUTER JOIN WORKS_ON W ON D.Dnumber = W.Pno) AS DW ON E.Dno = DW.Dnumber INNER JOIN (SELECT P.Pname, W.Pno FROM PROJECT P RIGHT OUTER JOIN WORKS_ON W ON P.Pnumber = W.Pno) AS PW ON DW.Dnumber = PW.Pno;

Fname varchar	Lname varchar	Dnumber int	Hours newdecimal	Pname varchar
James	Borg	1	32.5	ProductX
James	Borg	1	20.0	ProductX
James	Borg	1	32.5	ProductX
James	Borg	1	20.0	ProductX

d. SELECT E.Fname, E.Lname, D.Dname FROM EMPLOYEE E CROSS JOIN DEPARTMENT D;

Fname varchar	Lname varchar	Dname varchar
John	Smith	Research
John	Smith	Headquarters
John	Smith	Administration
Franklin	Wong	Research
Franklin	Wong	Headquarters
Franklin	Wong	Administration

e. SELECT E1.Fname AS Employee1, E1.Lname AS LastName1, E2.Fname AS Employee2, E2.Lname AS LastName2 FROM EMPLOYEE E1 JOIN EMPLOYEE E2 ON E1.Super_ssn = E2.Ssn;

Employee1 varchar	LastName1 varchar	Employee2 varchar	LastName2 varchar
John	Smith	Franklin	Wong
Franklin	Wong	James	Borg
Joyce	English	Franklin	Wong
Ramesh	Narayan	Franklin	Wong

f.   SELECT * FROM EMPLOYEE NATURAL JOIN DEPARTMENT;

Fname varchar	Minit string	Lname varchar	Ssn string	Bdate date	Address varchar	Sex string	Salary newdecimal	Super_ssn string	Dno int	Dname varchar	Dnumber int	Mgr_ssn string
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000.00	333445555	5	Research	5	333445555
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000.00	333445555	5	Administration	4	987654321
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000.00	333445555	5	Headquarters	1	888665555
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000.00	888665555	5	Research	5	333445555

3.   .

a.   SELECT l.location_id, l.city, c.country_name FROM locations l INNER JOIN countries c ON l.county_id = c.country_id;

location_id int	city varchar	country_name varchar
1000	Roma	Italy
1100	Venice	Italy
1200	Tokyo	Japan
1300	Hiroshima	Japan

b.   SELECT l.location_id, l.city, c.country_name FROM locations l LEFT OUTER JOIN countries c ON l.county_id = c.country_id;

location_id int	city varchar	country_name varchar
1000	Roma	Italy
1100	Venice	Italy
1200	Tokyo	Japan
1300	Hiroshima	Japan
1400	Southlake	(NULL)
1500	San Francisco	(NULL)
1600	San Jose	(NULL)
1700	Seattle	(NULL)

c. SELECT l.location_id, l.city, c.country_name FROM locations l RIGHT OUTER JOIN countries c ON l.county_id = c.country_id;

location_id int	city varchar	country_name varchar
(NULL)	(NULL)	Argentina
(NULL)	(NULL)	Australia
(NULL)	(NULL)	Belgium
(NULL)	(NULL)	Brazil
(NULL)	(NULL)	Canada
(NULL)	(NULL)	Switzerland
(NULL)	(NULL)	China
(NULL)	(NULL)	Germany
(NULL)	(NULL)	Denmark
(NULL)	(NULL)	Egypt
(NULL)	(NULL)	France

d. SELECT l1.location_id AS Location1, l2.location_id AS Location2 FROM
    locations l1 JOIN locations l2 ON l1.county_id = l2.county_id AND
    l1.location_id <> l2.location_id;

Location1 int	Location2 int
1100	1000
1000	1100
1300	1200
1200	1300
1700	1400
1600	1400
1500	1400
1700	1500

e. SELECT * FROM locations NATURAL JOIN countries;

location_id int	street_address varchar	postal_code varchar	city varchar	county_id string	country_id string	country_name varchar	region_id int
1700	2004 Charade Rd	98199	Seattle	US	AR	Argentina	2
1600	2007 Zagora St	50090	San Jose	US	AR	Argentina	2
1500	2011 Interiors Blvd	99236	San Francisco	US	AR	Argentina	2
1400	2014 Jabberwocky Rd	26192	Southlake	US	AR	Argentina	2
1300	9450 Kamiya-cho	6823	Hiroshima	JP	AR	Argentina	2
1200	2017 Shinjuku-ku	1689	Tokyo	JP	AR	Argentina	2
1100	93091 Calle della Te	10934	Venice	IT	AR	Argentina	2
1000	1297 Via Cola di Rie	989	Roma	IT	AR	Argentina	2
1700	2004 Charade Rd	98199	Seattle	US	AU	Australia	3
1600	2007 Zagora St	50090	San Jose	US	AU	Australia	3
1500	2011 Interiors Blvd	99236	San Francisco	US	AU	Australia	3
1400	2014 Jabberwocky Rd	26192	Southlake	US	AU	Australia	3

f. SELECT l.location_id, l.city, c.country_name FROM locations l, countries c WHERE l.county_id = c.country_id;

location_id int	city varchar	country_name varchar
1000	Roma	Italy
1100	Venice	Italy
1200	Tokyo	Japan
1300	Hiroshima	Japan

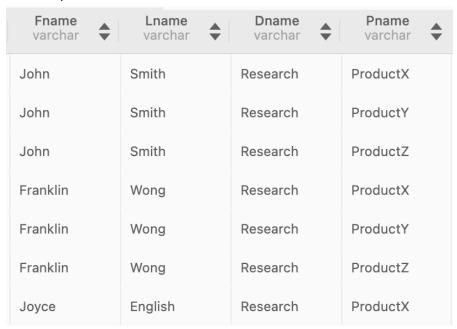g. SELECT l.location_id, l.city, c.country_name FROM locations l JOIN countries c ON l.location_id <> c.region_id;

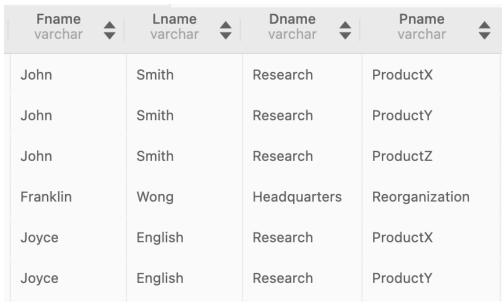| location_id int	city varchar	country_name varchar
1700	Seattle	Argentina
1600	San Jose	Argentina
1500	San Francisco	Argentina
1400	Southlake	Argentina
1300	Hiroshima	Argentina
1200	Tokyo	Argentina
1100	Venice	Argentina
1000	Roma	Argentina

4. .

   a. SELECT E.Fname, E.Lname, D.Dname, P.Pname FROM EMPLOYEE E JOIN DEPARTMENT D ON E.Dno = D.Dnumber JOIN PROJECT P ON D.Dnumber = P.Dnum;

Fname varchar	Lname varchar	Dname varchar	Pname varchar
John	Smith	Research	ProductX
John	Smith	Research	ProductY
John	Smith	Research	ProductZ
Franklin	Wong	Research	ProductX
Franklin	Wong	Research	ProductY
Franklin	Wong	Research	ProductZ
Joyce	English	Research	ProductX

   b. SELECT E.Fname, E.Lname, D.Dname, P.Pname FROM EMPLOYEE E JOIN DEPARTMENT D ON E.Super_ssn = D.Mgr_ssn JOIN PROJECT P ON D.Dnumber = P.Dnum;

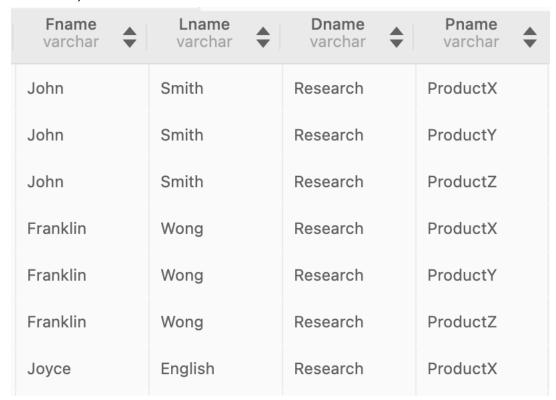| Fname varchar	Lname varchar	Dname varchar	Pname varchar
John	Smith	Research	ProductX
John	Smith	Research	ProductY
John	Smith	Research	ProductZ
Franklin	Wong	Headquarters	Reorganization
Joyce	English	Research	ProductX
Joyce	English	Research	ProductY

c. SELECT E.Fname, E.Lname, D.Dname, P.Pname FROM EMPLOYEE E JOIN
DEPARTMENT D ON E.Dno = D.Dnumber LEFT JOIN PROJECT P ON D.Dnumber
= P.Dnum;

Fname varchar	Lname varchar	Dname varchar	Pname varchar
John	Smith	Research	ProductX
John	Smith	Research	ProductY
John	Smith	Research	ProductZ
Franklin	Wong	Research	ProductX
Franklin	Wong	Research	ProductY
Franklin	Wong	Research	ProductZ
Joyce	English	Research	ProductX

d. SELECT E.Fname, E.Lname, D.Dname, P.Pname, P.Plocation FROM
EMPLOYEE E JOIN DEPARTMENT D ON E.Dno = D.Dnumber JOIN PROJECT P
ON D.Dnumber = P.Dnum WHERE P.Plocation = 'Houston';

Fname varchar	Lname varchar	Dname varchar	Pname varchar	Plocation varchar
John	Smith	Research	ProductZ	Houston
Franklin	Wong	Research	ProductZ	Houston
Joyce	English	Research	ProductZ	Houston
Ramesh	Narayan	Research	ProductZ	Houston
James	Borg	Headquarters	Reorganization	Houston