Assignment-2: SQL Intro, GEO-1006

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Project Description

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Contents

1 Graded Questions

1.1 Question 1

Question: Give a list (Fname, Minit, Lname) of all male employees with their salaries.

Answer:

```
select fname, minit, lname, salary
from employee
where sex = 'M';
```

	fname character varying (15)	minit character (1)	lname character varying (15)	salary numeric (10,2)
1	John	B	Smith	30000.00
2	Franklin	T	Wong	40000.00
3	Ramesh	K	Narayan	38000.00
4	Ahmad	V	Jabbar	25000.00
5	James	E	Borg	55000.00

1.2 Question 2

Question: Give a list of all different birthdays (month of birth, day of birth) of the employees (Hint: use 'extract(month from bdate)' to get the month from the birthdate). Order the list by birthday (month first).

Answer:

```
select extract(month from bdate) as month, extract(day from bdate) as day
from employee
order by month, day;
```

	month numeric	day numeric
1	1	9
2	1	19
3	3	29
4	6	20
5	7	31
6	9	15
7	11	10
8	12	8

1.3 Question 3

Question: Give a list of all employees (Lname) who do not have a supervisor in the table EMPLOYEE.

Answer:

```sql
select lname
from employee
where super_ssn is null;
```

	lname character varying (15)
1	Borg

1.4 Question 4

Question: Give a list of all employees (Lname, Salary) in the department 'Research'. Give the list in ascending order of salary.

Answer:

```sql
select e.lname, e.salary
from employee as e, department as d
where e.dno = d.dnumber and d.dname = 'Research'
order by e.salary ASCs;
```

	lname character varying (15)	salary numeric (10,2)
1	English	25000.00
2	Smith	30000.00
3	Narayan	38000.00
4	Wong	40000.00

1.5 Question 5

Question: Give a list (Fname, Lname, Dname) of all female department managers (N.B. in the PostgreSQL company database the attribute in DEPARTMENT indicating the department manager is called Mgr_ssn).

Answer:

```sql
select e.fname, e.lname, d.dname
from employee as e, department as d
where e.dno = d.dnumber and e.sex='F' and e.ssn = d.mgr_ssn;
```

	fname character varying (15)	lname character varying (15)	dname character varying (15)
1	Jennifer	Wallace	Administration

1.6 Question 6

Question: Give a list of all employees (Lname) that are supervisors of other employees.

Answer:

```sql
select distinct Lname AS Supervisor_LName
from employee
where ssn in (select super_ssn from employee where super_ssn is not null);
```

	supervisor_lname character varying (15)
1	Wallace
2	Borg
3	Wong

1.7 Question 7

Question: Give a list of all employees (Lname) that are not supervisors of a department.

Answer:

```sql
select distinct Lname
from employee
where ssn not in (select super_ssn from employee where super_ssn is not null);
```

	lname character varying (15)
1	Zelaya
2	English
3	Jabbar
4	Smith
5	Narayan

1.8 Question 8

Question: Give a list of all names of projects on which at least one employee is working for more than 15 hours a week.

Answer:

```sql
select distinct pname
from project as p, works_on as w
where p.pnumber = w.pno and w.hours > 15;
```

	pname character varying (15)
1	ProductX
2	Computerization
3	ProductZ
4	Newbenefits
5	ProductY

1.9 Question 9

Question: Give a list (Lname, Dependent_name) of all employees who have a male spouse in the dependent table.

Answer:

```
select e.lname, d.dependent_name
from employee as e, dependent as d
where e.ssn = d.essn and d.relationship = 'Spouse' and d.sex = 'M';
```

	lname character varying (15)	dependent_name character varying (15)
1	Wallace	Abner

1.10 Question 10

Question: Give a list of all employees (Lname) who work in a department that has a location in Houston.

Answer:

```
select distinct e.lname
from employee as e, dept_locations as dl
where e.dno = dl.dnumber and dl.dlocation = 'Houston';
```

	lname character varying (15)
1	Borg
2	English
3	Narayan
4	Smith
5	Wong

1.11 Question 11

Question: Give a list (Dname, Pname, Location) of department names, project names and locations with the property that the department supervises the project and that the department has a location in the place where the project is located.

Answer:

```
select d.dname, p.pname, dl.dlocation
from project p, department d join dept_locations dl on d.dnumber = dl.dnumber
where d.dnumber = p.dnum and dl.dlocation = p.plocation;
```

	dname	pname	dlocation
1	Research	ProductX	Bellaire
2	Research	ProductY	Sugarland
3	Research	ProductZ	Houston
4	Administration	Computerization	Stafford
5	Headquarters	Reorganization	Houston
6	Administration	Newbenefits	Stafford

1.12 Question 12

Question: How much does the company spend on salaries each year?

Answer:

```
select sum(e.salary)
from employee e;
```

	sum
1	281,000

1.13 Question 13

Question: How many different department locations does the company have?

Answer:

```
select count(distinct dl.dlocation) as num_of_locations
from dept_locations dl;
```

	num_of_locations
1	4

1.14 Question 14

Question: How much time a week is spent on the project Newbenefits?

Answer:

```
select sum(wo.hours)
from works_on wo join project p on wo.pno = p.pnumber
where p.pname = 'Newbenefits';
```

	sum
1	55

1.15 Question 15

Question: Give a list of all employees ((E)ssn) with the total amount of hours per week that each one spends on projects.

Answer:

```
select wo.essn, sum(wo.hours)
from works_on wo
group by wo.essn;
```

	essn	sum
1	999867777	40
2	666884444	40
3	987987987	40
4	888665555	0
5	123456789	40
6	987654321	35
7	333445555	40
8	453453453	40

1.16 Question 16

Question: Give the name of each department with the number of locations it has in the table Dept_Locations.

Answer:

```
select d.dname, count(distinct dl.dlocation)
from department d join dept_locations dl on d.dnumber = dl.dnumber
group by d.dnumber;
```

	dname	count
1	Headquarters	1
2	Administration	1
3	Research	3

1.17 Question 17

Question: How many employees are actually involved in projects?

Answer:

```
select count(e.ssn)
from employee e
where e.ssn in (
    select distinct wo.essn
    from works_on wo
    where wo.hours > 0
);
```

	count
1	7

1.18 Question 18

Question: Give the name(s) of the department(s) which have the biggest number of locations.

Answer:

```sql
-- We found WITH statement as a alternative of CREATE VIEW
with num_of_locations as (
    select count(distinct dl.dlocation) as num
    from dept_locations dl
    group by dl.dnumber
)
select d.dname
from department d join dept_locations dl on d.dnumber = dl.dnumber
group by d.dname
having count(distinct dl.dlocation) = (
    select max(n.num)
    from num_of_locations n
);
```

	dname
1	Research

1.19 Question 19

Question: Give the name of the department having the biggest average salary.

Answer:

```sql
with avg_salaries as (
    select  dno, avg(salary) as avg_salary
    from employee
    group by dno
)
select d.dname , a.avg_salary
from avg_salaries a join department d on a.dno = d.dnumber
where avg_salary = (
    select max(a2.avg_salary)
    from avg_salaries a2
);
```

	dname	avg
1	Headquarters	55,000

1.20 Question 20

Question: Give from the projects located in Houston with more than one participant, the one (Pname) on which the smallest total amount of hours a week is spent.

Answer:

```sql
with emp_count as (
    select p.pname, count(wo.essn) as num, sum(wo.hours) as hours
    from project p join works_on wo on p.pnumber = wo.pno
    group by p.pname
)
select ec.pname
from emp_count ec
where num > 1 and ec.pname in (
    select p.pname
    from project p, dept_locations dl
    where p.dnum = dl.dnumber and dl.dlocation = 'Houston'
)
order by ec.hours
limit 1;
```

	pname
1	Reorganization

2 Ungraded Questions

2.1 Question 21

Question: Give the name (Lname) of all employees that are not working on a project in Bellaire.

Answer:

```sql
select e.lname
from employee e
where e.ssn not in (
    select wo.essn
    from works_on wo join project p on wo.pno = p.pnumber
    where p.plocation = 'Bellaire'
);
```

	lname
1	Wong
2	Zelaya
3	Wallace
4	Narayan
5	Jabbar
6	Borg

2.2 Question 22

Question: Give the Lname of all department managers that have dependents.

Answer:

```
select e.lname
from employee e
where e.ssn in (
    select d.essn
    from dependent d, department d2
    where d.essn = d2.mgr_ssn
);
```

	lname
1	Wong
2	Wallace

2.3 Question 23

Question: Give the Lname of all employees that have a unique salary, i.e. a salary not earned by any other employee.

Answer:

```
with salary as (
    select e2.salary, count(e2.ssn)
    from employee e2
    group by e2.salary
)
select e.lname
from employee e, salary s
where e.salary = s.salary and count = 1;
```

	lname
1	Smith
2	Wong
3	Wallace
4	Narayan
5	Borg

2.4 Question 24

Question: Give the Pname of all projects in which all females of the company participate.

Answer:

```sql
select p.pname
from works_on wo join project p on wo.pno = p.pnumber
where wo.essn in (
    select e.ssn
    from employee e
    where e.sex = 'F'
)
group by p.pname
having count(distinct wo.essn) = (
    select count(distinct e.ssn)
    from employee e
    where e.sex = 'F'
);
```

	pname

2.5 Question 25

Question: Give the Pname of the projects in which all participants are female.

Answer:

```sql
select p.pname
from project p
where p.pnumber not in (
    select wo.pno
    from works_on wo
    where wo.essn in (
        select e.ssn
        from employee e
        where e.sex <> 'F'
    )
);

```

	pname

2.6 Question 26

Question: Give the (E)ssn of each employee (having at least one dependent) that has only female dependents.

Answer:

```sql
select d.essn
from dependent d
group by d.essn
having count(d.essn) = sum(
    case
        when d.sex = 'F' then 1
        else 0
    end
);
```

	essn

2.7 Question 27

Question: Give the Pname of projects in which from each department at least one employee participates.

Answer:

```sql
select p.pname
from project p
where p.pnumber in (
    select wo.pno
    from works_on wo join employee e on wo.essn = e.ssn
    group by pno
    having count(distinct e.dno) = (
        select count(distinct d.dnumber)
        from department d
    )
);
```

	pname
1	Reorganization