Kevin Cayo

Database I

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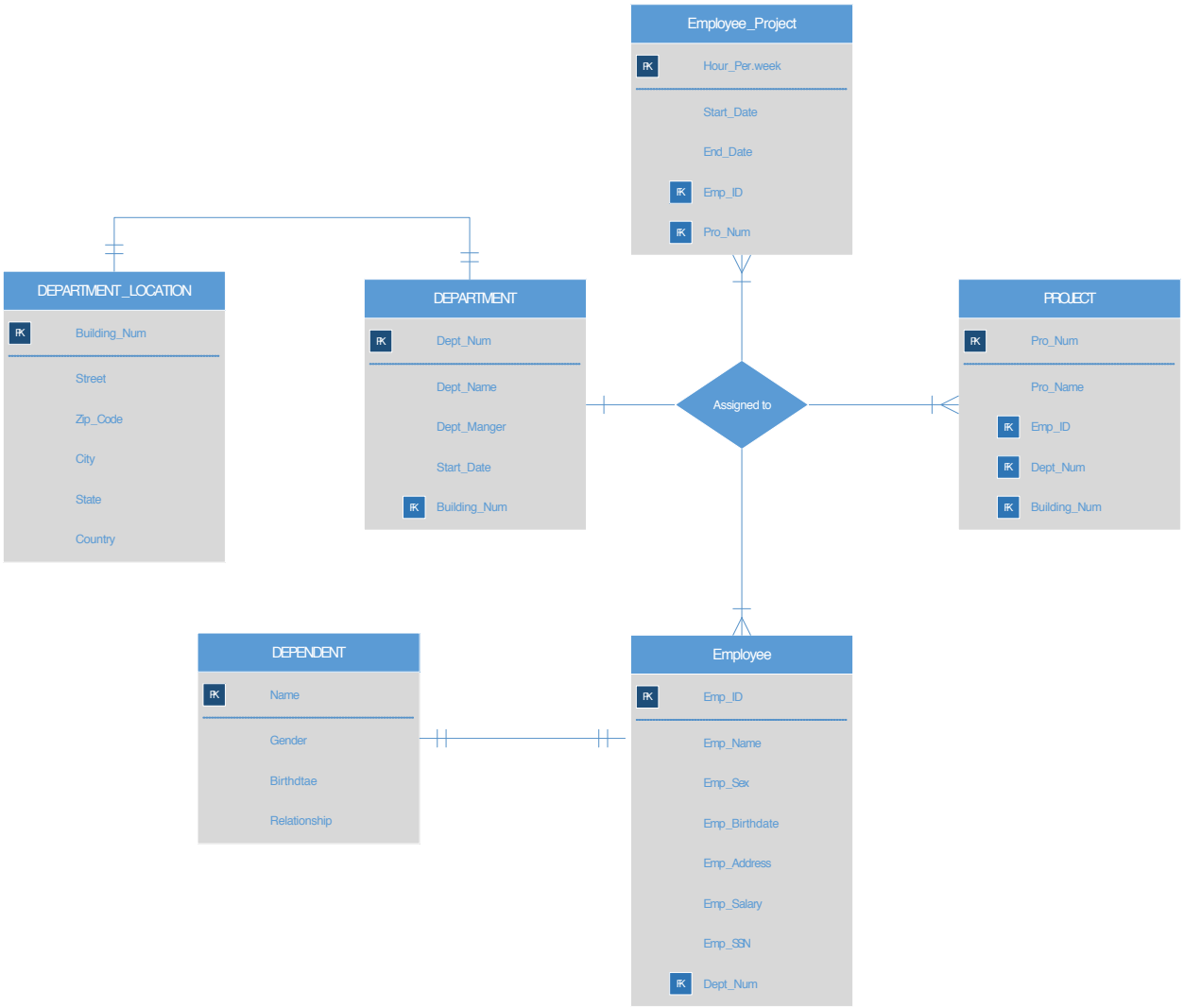
SEMESTER PROJECT

1. An E-R diagram for the COMPANY Database.



2. Data Definition Language (DDL), statements used to create tables and populate tables.

```
CREATE TABLE s_employees (
  E_SSN NUMBER(9) NOT NULL,
  S_SSN NUMBER(9),
  Dept_Num NUMBER(2),
  First_Name VARCHAR2(15),
  Last_Name VARCHAR2(15),
  Middle_Initial CHAR (1),
  Street_Address VARCHAR2(30),
  City VARCHAR(30),
  State CHAR(2),
  Zip VARCHAR(5),
  Birthday date,
  Gender CHAR(1),
  Salary_Num NUMBER(6,2),
  dEPENDENT char(1),
  CONSTRAINT s_employees_e_ssn_pk PRIMARY KEY(E_SSN),
  CONSTRAINT s_employees_dependent_ck CHECK (dependent IN('Y','N'))
);


INSERT INTO s_employees values (111111100,null,6,'Jared','James','D','123
Peachtree','Atlanta','GA','85000','10-Oct-66','M',20,'N');

INSERT INTO s_employees values (111111101,111111100,6,'Jon','Jones','C','111
Allgood','Atlanta','GA','45000','14-Nov-67','M',25,'N');

INSERT INTO s_employees values (111111102,111111100,6,'Justin','Mark','A','2342
May','Atlanta','GA','40000','12-Jan-66','M',30,'N');

INSERT INTO s_employees values (111111103,111111100,6,'Brad','Knight','C','176 Main
St.','Atlanta','GA','44000','13-Feb-68','M',30,'N');

INSERT INTO s_employees values (123456789,null,5,'John','Smith','B','731
Fondren','Houston','TX','30000','9-Jan-55','M',22,'Y');

INSERT INTO s_employees values (222222200,null,7,'Evan','Wallis','E','134
Pelham','Milwaukee','WI','92000','16-Jan-58','M',21,'N');

INSERT INTO s_employees values (222222201,222222200,7,'Josh','Zell','U','266
McGrady','Milwaukee','WI','56000','22-May-54','M',15,'N');
```

INSERT INTO s_employees values (222222202,222222200,7,'Andy','Vile','C','1967 Jordan','Milwaukee','WI','53000','21-Jan-44','M',20,'N');

INSERT INTO s_employees values (222222203,222222200,7,'Tom','Brand','G','112 Third St','Milwaukee','WI','62500','16-Dec-66','M',25,'N');

INSERT INTO s_employees values (222222204,222222201,7,'Jenny','Vos','F','263 Mayberry','Milwaukee','WI','61000','11-Nov-67','F',30,'N');

INSERT INTO s_employees values (222222205,222222201,7,'Chris','Carter','A','565 Jordan','Milwaukee','WI','43000','21-Mar-60','F',30,'N');

INSERT INTO s_employees values (333333300,null,6,'Kim','Grace','C','6677 Mills Ave','Sacramento','CA','79000','23-Oct-70','F',22,'N');

INSERT INTO s_employees values (333333301,333333300,6,'Jeff','Chase','H','145 Bradbury','Sacramento','CA','44000','7-Jan-70','M',21,'N');

INSERT INTO s_employees values (333445555,888665555,5,'Franklin','Wong','T','638 Voss','Houston','TX','40000','8-Dec-45','M',15,'Y');

INSERT INTO s_employees values (444444400,null,7,'Alex','Freed','D','4333 Pillsbury','Milwaukee','WI','89000','9-Oct-50','M',20,'Y');

INSERT INTO s_employees values (444444401,444444400,7,'Bonnie','Bays','S','111 Hollow','Milwaukee','WI','70000','19-Jun-56','F',25,'Y');

INSERT INTO s_employees values (444444402,444444400,7,'Alec','Best','C','233 Solid','Milwaukee','WI','60000','18-Jan-66','M',30,'Y');

INSERT INTO s_employees values (444444403,444444400,7,'Sam','Snedden','S','987 Windy St','Milwaukee','WI','48000','31-Jul-77','M',30,'N');

INSERT INTO s_employees values (453453453,333445555,5,'Joyce','English','A','5631 Rice','Houston','TX','25000','31-Jul-62','F',22,'N');

INSERT INTO s_employees values (555555500,null,6,'John','James','C','7676 Bloomington','Sacramento','CA','81000','30-Jun-75','M',21,'N');

INSERT INTO s_employees values (555555501,555555500,6,'Nandita','Ball','K','222 Howard','Sacramento','CA','62000','16-Apr-69','M',15,'N');

INSERT INTO s_employees values (666666600,null,8,'Bob','Bender','B','8794 Garfield','Chicago','IL','96000','17-Apr-68','M',20,'N');

INSERT INTO s_employees values (666666601,666666600,8,'Jill','Jarvis','J','6234 Lincoln','Chicago','IL','36000','14-Jan-66','F',25,'N');

INSERT INTO s_employees values (666666602,666666600,8,'Kate','King','W','1976 Boone Trace','Chicago','IL','44000','16-Apr-66','F',30,'N');

INSERT INTO s_employees values (666666603,666666601,8,'Lyle','Leslie','G','417 Hancock Ave','Chicago','IL','41000','9-Jan-63','M',30,'N');

INSERT INTO s_employees values (666666604,666666603,8,'Billie','King','J','556 Washington','Chicago','IL','38000','1-Jan-60','F',22,'N');

INSERT INTO s_employees values (666666605,666666603,8,'Jon','Kramer','A','1988 Windy Creek','Seattle','WA','41500','22-Aug-68','M',21,'N');

INSERT INTO s_employees values (666666606,666666604,8,'Ray','King','H','213 Delk Road','Seattle','WA','44500','16-Aug-49','M',15,'N');

INSERT INTO s_employees values (666666607,666666602,8,'Gerald','Small','D','122 Ball Street','Dallas','TX','29000','15-May-62','M',21,'N');

INSERT INTO s_employees values (666666608,666666602,8,'Arnold','Head','A','233 Spring St','Dallas','TX','33000','19-May-67','M',15,'N');

INSERT INTO s_employees values (666666609,666666602,8,'Helga','Pataki','C','101 Holyoke St','Dallas','TX','32000','11-Mar-69','F',20,'N');

INSERT INTO s_employees values (666666610,666666607,8,'Naveen','Drew','B','198 Elm St','Philadelphia','PA','34000','23-May-70','M',25,'N');

INSERT INTO s_employees values (666666611,666666610,8,'Carl','Reedy','E','213 Ball St','Philadelphia','PA','32000','21-Jun-77','M',30,'N');

INSERT INTO s_employees values (666666612,666666611,8,'Sammy','Hall','G','433 Main Street','Miami','FL','37000','11-Jan-70','M',30,'N');

INSERT INTO s_employees values (666666613,666666612,8,'Red','Bacher','A','196 Elm Street','Miami','FL','33500','21-May-80','M',22,'N');

INSERT INTO s_employees values (666884444,333445555,5,'Ramesh','Narayan','K','971 Fire Oak','Humble','TX','38000','15-Aug-52','M',21,'N');

INSERT INTO s_employees values (888665555,null,1,'James','Borg','E','450 Stone','Houston','TX','55000','10-Nov-27','M',15,'N');

INSERT INTO s_employees values (987654321,888665555,4,'Jennifer','Wallace','S','291 Berry','Bellaire','TX','43000','20-Jun-31','F',20,'Y');

INSERT INTO s_employees values (987987987,987654321,4,'Ahmad','Jabbar','V','980 Dallas','Houston','TX','25000','29-Mar-59','M',25,'N');

INSERT INTO s_employees values (999887777,987654321,4,'Alicia','Zelaya','J','3321 Castle','Sprint','TX','25000','19-Jul-58','F',30,'N');

```
CREATE TABLE s_deplocation(
  Building_Num NUMBER(1),
  City VARCHAR2(20),
  constraint s_deplocation_building_num_pk PRIMARY KEY (building_num, city)
);

INSERT INTO s_deplocation values(1, 'Houston');
INSERT INTO s_deplocation values(4, 'Stafford');
INSERT INTO s_deplocation values(5, 'Bellaire');
INSERT INTO s_deplocation values(5, 'Suagrland');
INSERT INTO s_deplocation values(5, 'Houston');
INSERT INTO s_deplocation values(6, 'Atlanta');
INSERT INTO s_deplocation values(6, 'Sacremento');
INSERT INTO s_deplocation values(7, 'Milwaukee');
INSERT INTO s_deplocation values(8, 'Chicago');
INSERT INTO s_deplocation values(8, 'Dallas');
INSERT INTO s_deplocation values(8, 'Philadelphia');
INSERT INTO s_deplocation values(8, 'Seattle');
INSERT INTO s_deplocation values(8, 'Miami');
```

```
CREATE TABLE s_dept(
  Name VARCHAR2(20),
  Dept_Num NUMBER(1),
  Manager_SSN NUMBER(9),
  Start_Date date,
  constraint s_dept_name_pk PRIMARY KEY(Name)
);

INSERT INTO s_dept values('Research', 5, 333445555, '22-May-78');
INSERT INTO s_dept values('Administration', 4, 987654321, '1-Jan-85');
INSERT INTO s_dept values('Headquarters', 1, 888665555, '19-Jun-71');
INSERT INTO s_dept values('Software', 6, 111111100, '15-May-99');
INSERT INTO s_dept values('Hardware', 7, 444444400, '15-May-98');
INSERT INTO s_dept values('Sales', 8, 555555500, '1-Jan-97');


CREATE TABLE s_dependent(
  E_SSN NUMBER(9),
  D_SSN NUMBER(9),
  FName VARCHAR(15),
  LName VARCHAR(15),
  Middle_I CHAR(1) null,
  Street_Address VARCHAR2(30),
  City VARCHAR(15),
  State CHAR(2),
  Zipcode VARCHAR(5),
  Gender CHAR(1),
  Birthdate date,
  Relation VARCHAR(10),
  constraint s_dependent_d_ssn_pk PRIMARY KEY(D_SSN)
);
```

INSERT INTO s_dependent values (333445555,202118616,'Alice','Wong',null,'638 Voss','Houston','TX','40000','F','5-Apr-76','Daughter');

INSERT INTO s_dependent values (333445555,936176413,'Theodore','Wong','A','639 Voss','Houston','TX','40001','M','25-Oct-73','Son');

INSERT INTO s_dependent values (333445555,262820652,'Joy','Wong','Q','640 Voss','Houston','TX','40002','F','3-May-48','Spouse');

INSERT INTO s_dependent values (987654321,899520223,'Abner','Wallace',null,'291 Berry','Bellaire','TX','43000','M','29-Feb-32','Spouse');

INSERT INTO s_dependent values (123456789,172973247,'Michael','Smith','V','731 Fondren','Houston','TX','30000','M','1-Jan-78','Son');

INSERT INTO s_dependent values (123456789,632464120,'Alice','Smith','C','732 Fondren','Houston','TX','12345','F','31-Dec-78','Daughter');

INSERT INTO s_dependent values (123456789,558149124,'Elizabeth','Smith','B','733 Fondren','Houston','TX','23456','F','5-May-57','Spouse');

INSERT INTO s_dependent values (444444400,405455557,'Johnny','Freed','E','4333 Pillsbury','Milwaukee','WI','89000','M','4-Apr-97','Son');

INSERT INTO s_dependent values (444444400,312921670,'Tommy','Freed',null,'4334 Pillsbury','Milwaukee','WI','98765','M','7-Jun-99','Son');

INSERT INTO s_dependent values (444444401,195997784,'Chris','Bays','R','111 Hollow','Milwaukee','WI','70000','M','19-Apr-69','Spouse');

INSERT INTO s_dependent values (444444402,466631769,'Sam','Best','T','233 Solid','Milwaukee','WI','60000','M','14-Feb-64','Spouse');

```
CREATE TABLE s_projects(
  Proj_Name VARCHAR(25),
  Proj_Num NUMBER(2),
  City VARCHAR(15),
  Dept_Num NUMBER(1)
);

INSERT INTO s_projects values ('ProductX',1,'Bellaire',5);
INSERT INTO s_projects values ('ProductY',2,'Sugarland',5);
INSERT INTO s_projects values ('ProductZ',3,'Houston',5);
INSERT INTO s_projects values ('Computerization',10,'Stafford',4);
INSERT INTO s_projects values ('Reorganization',20,'Houston',1);
INSERT INTO s_projects values ('Newbenefits',30,'Stafford',4);
INSERT INTO s_projects values ('OperatingSystems',61,'Jacksonville',6);
INSERT INTO s_projects values ('DatabaseSystems',62,'Birmingham',6);
INSERT INTO s_projects values ('Middleware',63,'Jackson',6);
INSERT INTO s_projects values ('InkjetPrinters',91,'Phoenix',7);
INSERT INTO s_projects values ('LaserPrinters',92,'LasVegas',7);
```

```
CREATE TABLE e_projects(
  E_SSN NUMBER(9) not null,
  project_num NUMBER(2),
  hours NUMBER(4,1)
);

INSERT INTO e_projects values (123456789,1,32.5);
INSERT INTO e_projects values (123456789,2,7.5);
INSERT INTO e_projects values (666884444,3,40);
INSERT INTO e_projects values (453453453,1,20);
INSERT INTO e_projects values (453453453,2,20);
INSERT INTO e_projects values (333445555,2,10);
INSERT INTO e_projects values (333445555,3,10);
INSERT INTO e_projects values (333445555,10,10);
INSERT INTO e_projects values (333445555,20,10);
INSERT INTO e_projects values (999887777,30,30);
INSERT INTO e_projects values (999887777,10,10);
INSERT INTO e_projects values (987987987,10,35);
INSERT INTO e_projects values (987987987,30,5);
INSERT INTO e_projects values (987654321,30,20);
INSERT INTO e_projects values (987654321,20,15);
INSERT INTO e_projects values (888665555,20,null);
INSERT INTO e_projects values (111111100,61,40);
INSERT INTO e_projects values (111111101,61,40);
INSERT INTO e_projects values (111111102,61,40);
INSERT INTO e_projects values (111111103,61,40);
INSERT INTO e_projects values (222222200,62,40);
INSERT INTO e_projects values (222222201,62,48);
INSERT INTO e_projects values (222222202,62,40);
INSERT INTO e_projects values (222222203,62,40);
INSERT INTO e_projects values (222222204,62,40);
```

INSERT INTO e_projects values (222222205,62,40);

INSERT INTO e_projects values (333333300,63,40);

INSERT INTO e_projects values (333333301,63,46);

INSERT INTO e_projects values (444444400,91,40);

INSERT INTO e_projects values (444444401,91,40);

INSERT INTO e_projects values (444444402,91,40);

INSERT INTO e_projects values (444444403,91,40);

INSERT INTO e_projects values (555555500,92,40);

INSERT INTO e_projects values (555555501,92,44);

INSERT INTO e_projects values (666666601,91,40);

INSERT INTO e_projects values (666666603,91,40);

INSERT INTO e_projects values (666666604,91,40);

INSERT INTO e_projects values (666666605,92,40);

INSERT INTO e_projects values (666666606,91,40);

INSERT INTO e_projects values (666666607,61,40);

INSERT INTO e_projects values (666666608,62,40);

INSERT INTO e_projects values (666666609,63,40);

INSERT INTO e_projects values (666666610,61,40);

INSERT INTO e_projects values (666666611,61,40);

INSERT INTO e_projects values (666666612,61,40);

INSERT INTO e_projects values (666666613,61,30);

INSERT INTO e_projects values (666666613,62,10);

INSERT INTO e_projects values (666666613,63,10);

3. SQL reports for the following 20 (separate page for each).

Query 1. Retrieve the name and address of all employees who work for the Research department.

```
SELECT first_name, last_name, street_address
from S_EMPLOYEE1
where s_employee1.dept_num = (select S_DEPARTMENT.DEPT_NUM from s_department where s_department.dept_name = 'Research');
```

ript Output × Query Result ×

SQL | All Rows Fetched: 4 in 0.005 seconds

	FIRST_NAME	LAST_NAME	STREET_ADDRESS
1	John	Smith	731 Fondren
2	Franklin	Wong	638 Voss
3	Joyce	English	5631 Rice
4	Ramesh	Narayan	971 Fire Oak

Query 2. For every project located in Stafford, list the project number, the controlling department number, and the department manager's last name, address, and birthdate.

Worksheet | Query Builder

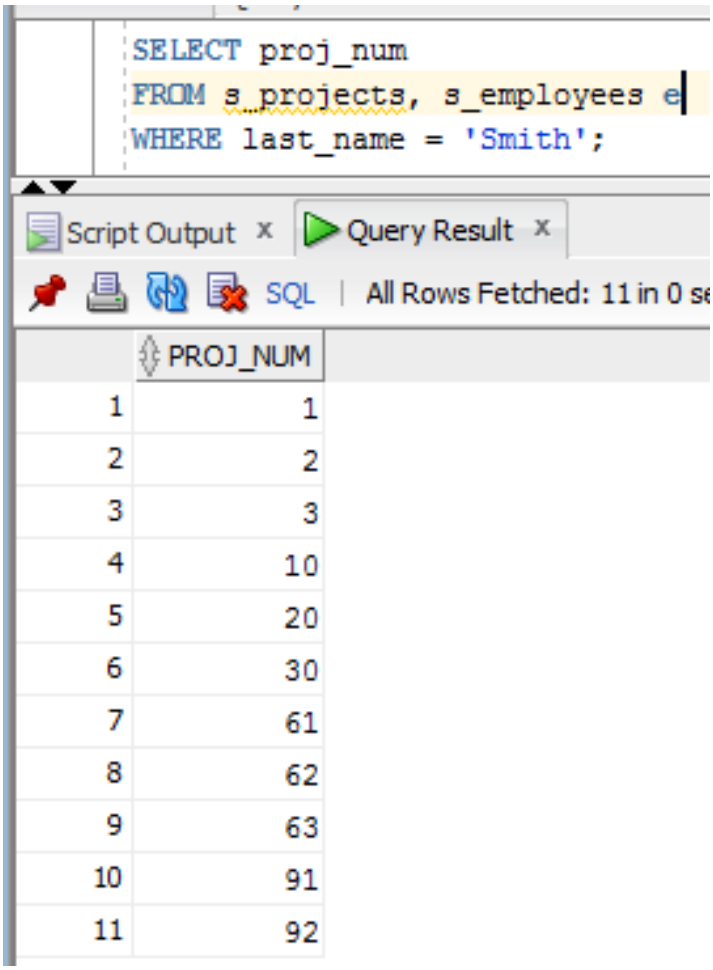
```
SELECT DISTINCT p.proj_num, d.dept_num, e.last_name, e.street_address, e.birthday
FROM s_projects p, s_dept d, s_employees e
WHERE e.dept_num = d.dept_num AND e.E_SSN = d.Manager_SSN AND p.city = 'Stafford' and S_SSN is NULL;
```

Query Result

SQL | All Rows Fetched: 6 in 0 seconds

	PROJ_NUM	DEPT_NUM	LAST_NAME	STREET_ADDRESS	BIRTHDAY
1	30	6	James	123 Peachtree	10-OCT-66
2	10	1	Borg	450 Stone	10-NOV-27
3	30	7	Freed	4333 Pillsbury	09-OCT-50
4	10	7	Freed	4333 Pillsbury	09-OCT-50
5	10	6	James	123 Peachtree	10-OCT-66
6	30	1	Borg	450 Stone	10-NOV-27

Query 3. Make a list of all project numbers for projects that involve an employee whose last name is Smith either as a worker or as a manager of the department that controls the project.



```
SELECT proj_num
FROM s_projects, s_employees e
WHERE last_name = 'Smith';
```

Script Output | Query Result | SQL | All Rows Fetched: 11 in 0 s

	PROJ_NUM
1	1
2	2
3	3
4	10
5	20
6	30
7	61
8	62
9	63
10	91
11	92

Query 4. Retrieve the names of all employees who have two or more dependents.

```
SELECT first_name, last_name
FROM s_employees JOIN s_dependent USING (E_SSN)
GROUP BY first_name, last_name
HAVING COUNT (E_SSN) >= 2;
```

cript Output x | Query Result x

SQL | All Rows Fetched: 3 in 0.013 seconds

	FIRST_NAME	LAST_NAME
1	Franklin	Wong
2	Alex	Freed
3	John	Smith

Query 5. For each employee, retrieve the employee's first and last name and the first and last name of his or her immediate supervisor.

```
SELECT e.first_name, e.last_name, m.first_name "Manager First Name", m.last_name "Manager Last Name"
FROM s_employees  e, s_employees m
WHERE e.E_SSN = m.S_SSN;
```

Script Output | Query Result

SQL | All Rows Fetched: 32 in 0.015 seconds

	FIRST_NAME	LAST_NAME	Manager First Name	Manager Last Name
1	Jared	James	Jon	Jones
2	Jared	James	Brad	Knight
3	Evan	Wallis	Josh	Zell
4	Evan	Wallis	Andy	Vile
5	Evan	Wallis	Tom	Brand
6	Josh	Zell	Jenny	Vos
7	Josh	Zell	Chris	Carter
8	Kim	Grace	Jeff	Chase
9	James	Borg	Franklin	Wong
10	Alex	Freed	Bonnie	Bays
11	Alex	Freed	Alec	Best
12	Alex	Freed	Sam	Snedden
13	Franklin	Wong	Joyce	English
14	John	James	Nandita	Ball
15	Bob	Bender	Jill	Jarvis
16	Bob	Bender	Kate	King
17	Jill	Jarvis	Lyle	Leslie
18	Lyle	Leslie	Billie	King
19	Lyle	Leslie	Jon	Kramer
20	Billie	King	Ray	King
21	Kate	King	Gerald	Small
22	Kate	King	Arnold	Head
23	Kate	King	Helga	Pataki
24	Gerald	Small	Naveen	Drew
25	Naveen	Drew	Carl	Reedy
26	Carl	Reedy	Sammy	Hall
27	Sammy	Hall	Red	Bacher
28	Franklin	Wong	Ramesh	Narayan
29	James	Borg	Jennifer	Wallace
30	Jennifer	Wallace	Ahmad	Jabbar
31	Jennifer	Wallace	Alicia	Zelaya
32	Jared	James	Justin	Mark

Query 6. Retrieve all employee SSNs.

```
SELECT Employee_SSN FROM s_employee1;
```

Script Output | Query Result | SQL | All Rows Fetched: 40 in 0 seconds

	EMPLOYEE_SSN
4	111111103
5	123456789
6	222222200
7	222222201
8	222222202
9	222222203
10	222222204
11	222222205
12	333333300
13	333333301
14	333445555
15	444444400
16	444444401
17	444444402
18	444444403
19	453453453
20	555555500
21	555555501
22	666666600
23	666666601
24	666666602
25	666666603
26	666666604
27	666666605
28	666666606
29	666666607
30	666666608
31	666666609
32	666666610
33	666666611
34	666666612
35	666666613
36	666884444
37	888665555
38	987654321
39	987987987
40	999887777

Query 7. Retrieve all combinations of SSN and DEPARTMENT NAME.

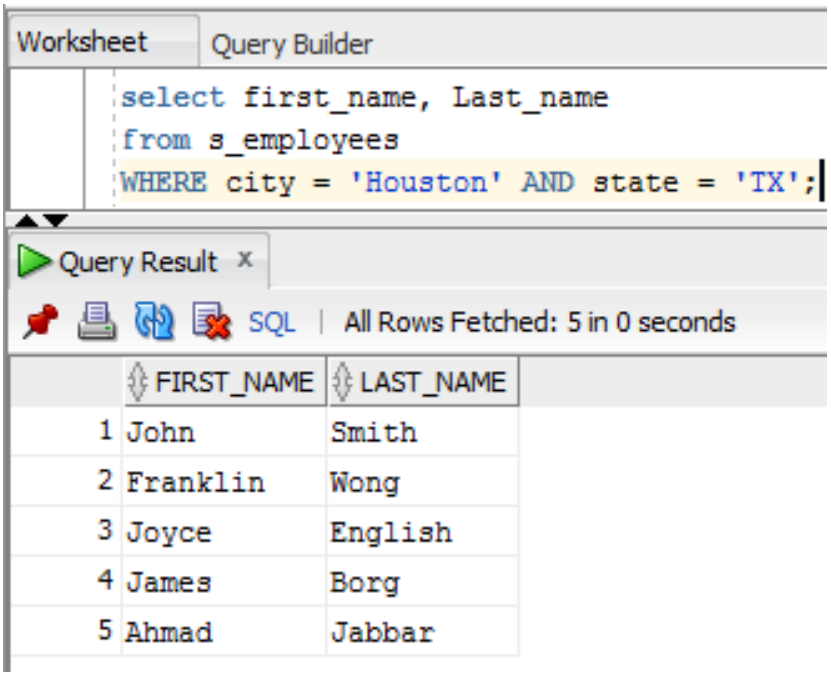
```
SELECT E_SSN, S_SSN, s_dept.name
FROM s_employees, s_dept;
```

Query Result

SQL | All Rows Fetched: 234 in 0.016 seconds

	E_SSN	S_SSN	NAME
202	222222202	222222200	Software
203	222222203	222222200	Software
204	222222204	222222201	Software
205	222222205	222222201	Software
206	333333300	(null)	Software
207	333333301	333333300	Software
208	333445555	888665555	Software
209	444444400	(null)	Software
210	444444401	444444400	Software
211	444444402	444444400	Software
212	444444403	444444400	Software
213	453453453	333445555	Software
214	555555500	(null)	Software
215	555555501	555555500	Software
216	666666600	(null)	Software
217	666666601	666666600	Software
218	666666602	666666600	Software
219	666666603	666666601	Software
220	666666604	666666603	Software
221	666666605	666666603	Software
222	666666606	666666604	Software
223	666666607	666666602	Software
224	666666608	666666602	Software
225	666666609	666666602	Software
226	666666610	666666607	Software
227	666666611	666666610	Software
228	666666612	666666611	Software
229	666666613	666666612	Software
230	666884444	333445555	Software
231	888665555	(null)	Software
232	987654321	888665555	Software
233	987987987	987654321	Software
234	999887777	987654321	Software

Query 8. Retrieve all employees whose address is in Houston, Texas.



Query 9. Show the resulting salaries if every employee working on the ProductX project is given a 10% raise.

```
SELECT (salary_num*1.1)
FROM S_EMPLOYEES E, E_PROJECTS P, S_PROJECTS R
WHERE E.E_SSN(+) = P.E_SSN
AND P.PROJECT_NUM = R.PROJ_NUM
AND LOWER (R.PROJ_NAME) = 'productx';
```

Script Output | Query Result

SQL | All Rows Fetched: 2 in 0.015 seconds

	(SALARY_NUM*1.1)
1	24.2
2	24.2

Query 10. Retrieve a list of employees and the projects they are working on, ordered by department and, within each department, ordered alphabetically by last name, first name.

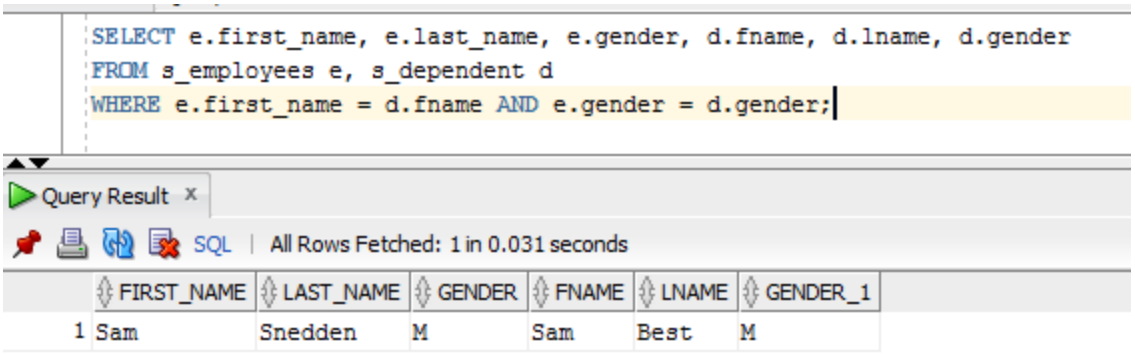
```
SELECT e.first_name, e.last_name, p.proj_name
FROM s_employees e, e_projects r, s_projects p
WHERE e.E_SSN = r.E_SSN AND r.project_num = p.proj_num
ORDER BY dept_num, last_name, first_name;
```

Query Result

SQL | All Rows Fetched: 47 in 0.016 seconds

	FIRST_NAME	LAST_NAME	PROJ_NAME
1	James	Borg	Reorganization
2	Ahmad	Jabbar	Newbenefits
3	Ahmad	Jabbar	Computerization
4	Jennifer	Wallace	Reorganization
5	Jennifer	Wallace	Newbenefits
6	Alicia	Zelaya	Computerization
7	Alicia	Zelaya	Newbenefits
8	Joyce	English	ProductY
9	Joyce	English	ProductX
10	Ramesh	Narayan	ProductZ
11	John	Smith	ProductY
12	John	Smith	ProductX
13	Franklin	Wong	Reorganization
14	Franklin	Wong	ProductY
15	Franklin	Wong	ProductZ
16	Franklin	Wong	Computerization
17	Nandita	Ball	LaserPrinters
18	Jeff	Chase	Middleware
19	Kim	Grace	Middleware
20	Jared	James	OperatingSystems
21	John	James	LaserPrinters
22	Jon	Jones	OperatingSystems
23	Brad	Knight	OperatingSystems
24	Bonnie	Bays	InkjetPrinters
25	Alec	Best	InkjetPrinters
26	Tom	Brand	DatabaseSystems
27	Chris	Carter	DatabaseSystems
28	Alex	Freed	InkjetPrinters
29	Sam	Snedden	InkjetPrinters
30	Andy	Vile	DatabaseSystems
31	Jenny	Vos	DatabaseSystems
32	Evan	Wallis	DatabaseSystems

Query 11. Retrieve the name of each employee who has a dependent with the same first name and same sex as the employee.



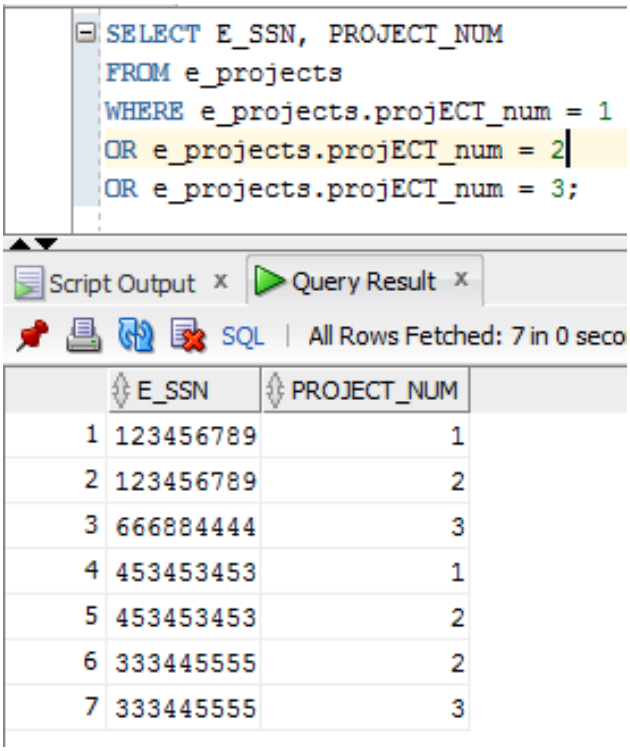
```
SELECT e.first_name, e.last_name, e.gender, d.fname, d.lname, d.gender
FROM s_employees e, s_dependent d
WHERE e.first_name = d.fname AND e.gender = d.gender;
```

Query Result

SQL | All Rows Fetched: 1 in 0.031 seconds

	FIRST_NAME	LAST_NAME	GENDER	FNAME	LNAME	GENDER_1
1	Sam	Snedden	M	Sam	Best	M

Query 12. Retrieve the social security numbers of all employees who work on project numbers 1, 2, or 3.



```
SELECT E_SSN, PROJECT_NUM
FROM e_projects
WHERE e_projects.projECT_num = 1
OR e_projects.projECT_num = 2
OR e_projects.projECT_num = 3;
```

Script Output x | Query Result x

SQL | All Rows Fetched: 7 in 0 seco

	E_SSN	PROJECT_NUM
1	123456789	1
2	123456789	2
3	666884444	3
4	453453453	1
5	453453453	2
6	333445555	2
7	333445555	3

Query 13. Retrieve the names of all employees who do not have a supervisor.

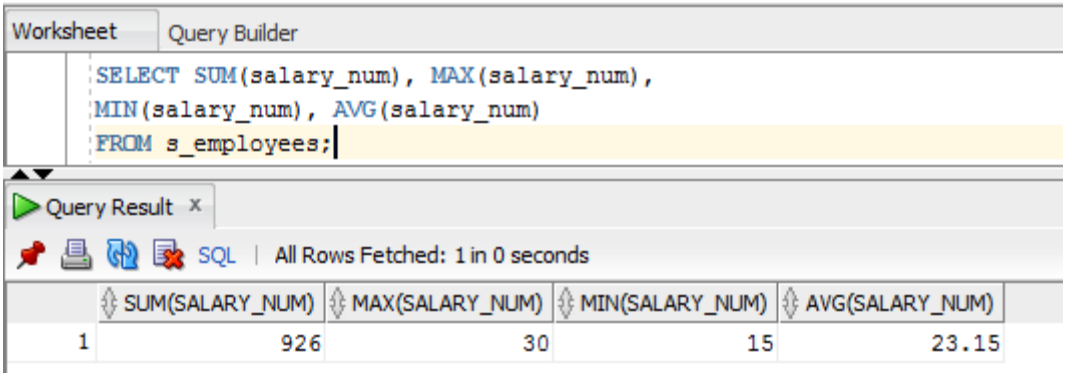
```
SELECT first_name, last_name
FROM s_employees
WHERE S_SSN is null;
```

Query Result

SQL | All Rows Fetched: 8 in 0.078 seconds

	FIRST_NAME	LAST_NAME
1	Jared	James
2	John	Smith
3	Evan	Wallis
4	Kim	Grace
5	Alex	Freed
6	John	James
7	Bob	Bender
8	James	Borg

Query 14. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary.



Query 15. Find the sum of the salaries of all employees of the Research department, as well as the maximum salary, the minimum salary, and the average salary in this department.

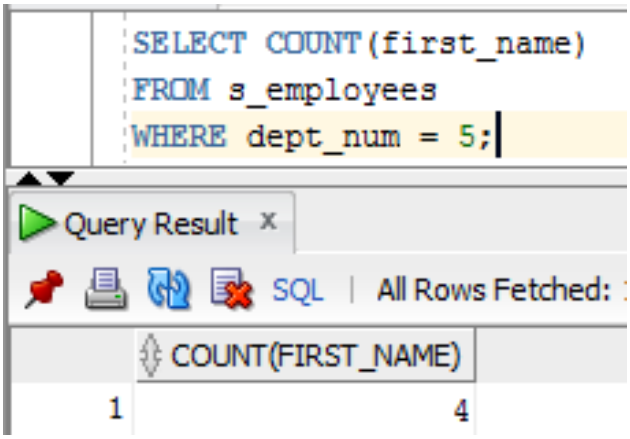
```
SELECT SUM(salary_num), MAX(salary_num), MIN(salary_num), AVG(salary_num)
FROM s_employees
WHERE dept_num = 5;
```

Query Result

SQL | All Rows Fetched: 1 in 0 seconds

	SUM(SALARY_NUM)	MAX(SALARY_NUM)	MIN(SALARY_NUM)	AVG(SALARY_NUM)
1	80	22	15	20

Query 16. Retrieve the total number of employees in the Research department.



Query 17. For each department, retrieve the department number, the number of employees in the department, and their average salary.

```
SELECT COUNT(E_SSN ), dept_num, ROUND(AVG(salary_num)) salary_num
FROM s_employees
GROUP BY dept_num;
```

Query Result

SQL | All Rows Fetched: 6 in 0.015 seconds

	COUNT(E_SSN)	DEPT_NUM	SALARY_NUM
1	1	1	15
2	7	6	22
3	4	5	20
4	3	4	25
5	14	8	23
6	10	7	25

Query 18. For each project, retrieve the project number, the project name, and the number of employees who work on that project.

```
SELECT p.proj_num, p.proj_name, COUNT(*)
FROM s_projects p, e_projects e
WHERE p.proj_num = e.project_num
GROUP BY p.proj_num, p.proj_name;
```

Query Result

SQL | All Rows Fetched: 11 in 0.016 seconds

	PROJ_NUM	PROJ_NAME	COUNT(*)
1	20	Reorganization	3
2	1	ProductX	2
3	61	OperatingSystems	9
4	92	LaserPrinters	3
5	62	DatabaseSystems	8
6	63	Middleware	4
7	10	Computerization	3
8	30	Newbenefits	3
9	2	ProductY	3
10	91	InkjetPrinters	8
11	3	ProductZ	2

Query 19. For each project on which more than two employees work, retrieve the project number, the project name, and the number of employees who work on the project.

```
SELECT COUNT(E_SSN), proj_name
FROM e_projects, s_projects
GROUP BY proj_name HAVING COUNT(E_SSN) > 2;
```

Query Result

SQL | All Rows Fetched: 11 in 0.016 seconds

	COUNT(E_SSN)	PROJ_NAME
1	48	Computerization
2	48	DatabaseSystems
3	48	InkjetPrinters
4	48	LaserPrinters
5	48	Middleware
6	48	Newbenefits
7	48	OperatingSystems
8	48	ProductX
9	48	ProductY
10	48	ProductZ
11	48	Reorganization

Query 20. For each project, retrieve the project number, the project name, and the number of employees from department 5 who work on the project.

```
SELECT p.proj_name, p.proj_num, COUNT(*)
FROM s_projects p, e_projects e, s_employees s
WHERE p.proj_num = e.project_num AND
s.dept_num = 5
GROUP BY p.proj_num, p.proj_name;
```

Query Result

SQL | All Rows Fetched: 11 in 0 seconds

	PROJ_NAME	PROJ_NUM	COUNT(*)
1	Reorganization	20	12
2	ProductX	1	8
3	OperatingSystems	61	36
4	LaserPrinters	92	12
5	DatabaseSystems	62	32
6	Middleware	63	16
7	Computerization	10	12
8	Newbenefits	30	12
9	ProductY	2	12
10	InkjetPrinters	91	32
11	ProductZ	3	8