

21BDS0340

Abhinav Dinesh Srivatsa

Database Management Systems

Exercise – I

Tables and Alterations:

```
create table employee(f_name varchar(25), m_name varchar(1), l_name varchar(25), ssn
number(9), bday Date, address varchar(50), sex varchar(1), salary number(6), super_ssn
number(9), dept number(1));
```

```
create table department(name varchar(25), num number(2), mgr_ssn number(9),
mgr_start_date Date);
```

```
create table project(name varchar(2), num number(4), location varchar(25), dept
number(2));
```

Exercises:

1. Insert the data given above in both employee, department, and project tables.

Commands:

```
insert into employee (f_name, m_name, l_name, ssn, bday, address, sex, salary, super_ssn,
dept) values('Joyce', 'Y', 'Pan', 543216789, '07-Feb-78', '35 A 18 E, Salt lake City, UT', 'F',
70000, NULL, 2);
```

```
insert into department (name, num, mgr_ssn, mgr_start_date) values ('Manufacture', 1,
888665555, '19-Jun-71');
```

```
insert into project (name, num, location, dept) values ('A', 3388, 'Houston', 1);
```

Output:

```
SQL> insert into employee (f_name, m_name, l_name, ssn, bday, address, sex, salary, super_ssn, dept) values('Frankin', 'T',
'Wong', 333445555, '08-Dec-45', '638 Voss, Houston, TX', 'M', 40000, 554433221, 5);
1 row created.
```

2. Display all the employees information.

Command:

```
select * from employee;
```

Output:

```
SQL> select * from employee;
```

F_NAME	S	SALARY	M L_NAME	DEPT	SSN	BDAY	ADDRESS
			SUPER_SSN				
Doug	M	80000	E Glibert	3	554433221	09-JUN-60	11 S 59 E, Salt Lake City, UT
Joyce	F	70000	Y Pan	2	543216789	07-FEB-78	35 A 18 E, Salt lake City, UT
Frankin	M	40000	T Wong	5	333445555	08-DEC-45	638 Voss, Houston, TX
Jennifer	F	43000	S Wallace	4	987654321	20-JUN-31	291 Berry, Bellaire, TX
John	M	30000	B Smith	5	123456789	09-JAN-55	731 Fondren, Houston, TX
Ramesh	M	38000	K Narayan	5	666884444	15-SEP-52	975 Fire Oak, Humble, TX
Joyce	F	25000	A English	5	453453453	31-JUL-62	5631 Rice, Houston, TX
James	M	55000	E Borg	1	888665555	10-NOV-27	450 Stone, Houston, TX
Alicia	F	25000	J Zelaya	4	999887777	19-JUL-58	3321 Castle, Spring, TX
Ahmad	M	25000	V Jabbar	4	987987987	29-MAR-59	980 Dallas, Houston, TX

10 rows selected.

3. Display the employee name along with their SSN and supervisor SSN.

Command:

```
select f_name, m_name, l_name, ssn, super_ssn from employee;
```

Output:

```
SQL> select f_name, m_name, l_name, ssn, super_ssn from employee;
```

F_NAME	M L_NAME	SSN	SUPER_SSN
Doug	E Glibert	554433221	
Joyce	Y Pan	543216789	
Frankin	T Wong	333445555	554433221
Jennifer	S Wallace	987654321	554433221
John	B Smith	123456789	333445555
Ramesh	K Narayan	666884444	333445555
Joyce	A English	453453453	333445555
James	E Borg	888665555	543216789
Alicia	J Zelaya	999887777	987654321
Ahmad	V Jabbar	987987987	987654321

10 rows selected.

4. Display the employee names whose birthday is 29-MAR-1959. "

Command:

```
select f_name, m_name, l_name from employee where bday='29-MAR-1959';
```

Output:

```
SQL> select f_name, m_name, l_name from employee where bday='29-MAR-1959';
```

F_NAME	M L_NAME
Ahmad	V Jabbar

5. Display the salary of the employees without duplication.

Command:

```
select distinct salary from employee;
```

Output:

```
SQL> select distinct salary from employee;
```

SALARY
80000
70000
40000
43000
30000
38000
25000
55000

8 rows selected.

6. Display the manager SSN, manager start date of the finance department.

Command:

```
select mgr_ssn, mgr_start_date from department where name='Finance';
```

Output:

```
SQL> select mgr_ssn, mgr_start_date from department where name='Finance';
```

MGR_SSN	MGR_START_DATE
987654321	01-JAN-85

7. Modify the department number of an employee having first name as Joyce to 5.

Command:

```
update employee set dept=5 where f_name='Joyce';
```

Output:

```
SQL> update employee set dept=5 where f_name='Joyce';

2 rows updated.

SQL> select * from employee;
```

F_NAME	S	SALARY	M L_NAME	DEPT	SSN	B DAY	ADDRESS
Doug	M	80000	E Glibert	3	554433221	09-JUN-60	11 S 59 E, Salt Lake City, UT
Joyce	F	70000	Y Pan	5	543216789	07-FEB-78	35 A 18 E, Salt lake City, UT
Frankin	M	40000	T Wong	5	333445555	08-DEC-45	638 Voss, Houston, TX
Jennifer	F	43000	S Wallace	4	987654321	20-JUN-31	291 Berry, Bellaire, TX
John	M	30000	B Smith	5	123456789	09-JAN-55	731 Fondren, Houston, TX
Ramesh	M	38000	K Narayan	5	666884444	15-SEP-52	975 Fire Oak, Humble, TX
Joyce	F	25000	A English	5	453453453	31-JUL-62	5631 Rice, Houston, TX
James	M	55000	E Borg	1	888665555	10-NOV-27	450 Stone, Houston, TX
Alicia	F	25000	J Zelaya	4	999887777	19-JUL-58	3321 Castle, Spring, TX
Ahmad	M	25000	V Jabbar	4	987987987	29-MAR-59	980 Dallas, Houston, TX

```
10 rows selected.
```

8. Alter the department table to add a column for department phone number of number data type and insert values into this column only.

Command:

```
alter table department add dept_phone_num number(10);
update department set dept_phone_num=1234567890 where num=1;
update department set dept_phone_num=0987654321 where num=2;
update department set dept_phone_num=1236540987 where num=3;
update department set dept_phone_num=0985673214 where num=4;
update department set dept_phone_num=4125012356 where num=5;
```

Output:

```
[SQL> alter table department add dept_phone_num number(10);

Table altered.

[SQL> update department set dept_phone_number=1234567890 where num=1;
update department set dept_phone_number=1234567890 where num=1
*
ERROR at line 1:
ORA-00904: "DEPT_PHONE_NUMBER": invalid identifier

[SQL> alter table department drop dept_phone_num;
alter table department drop dept_phone_num
*
ERROR at line 1:
ORA-00905: missing keyword

[SQL> alter table department drop column dept_phone_num;

Table altered.

[SQL> alter table department add dept_phone_num number(10);

Table altered.

[SQL> update department set dept_phone_num=1234567890 where num=1;

1 row updated.

[SQL> update department set dept_phone_num=0987654321 where num=2;

1 row updated.

[SQL> update department set dept_phone_num=1236540987 where num=3;

1 row updated.

[SQL> update department set dept_phone_num=0985673214 where num=4;

1 row updated.

[SQL> update department set dept_phone_num=4125012356 where num=5;

1 row updated.

[SQL> select * from department;
```

NAME	NUM	MGR_SSN	MGR_START_DATE	DEPT_PHONE_NUM
Manufacture	1	888665555	19-JUN-71	1234567890
Administration	2	543216789	04-JAN-99	987654321
Headquarter	3	554433221	22-SEP-55	1236540987
Finance	4	987654321	01-JAN-85	985673214
Research	5	333445555	22-MAY-78	4125012356

9. Alter the department table and change the department phone number size.

Command:

```
alter table department modify dept_phone_num number(15);
```

Output:

```
[SQL> alter table department modify dept_phone_num number(15);

Table altered.

[SQL> select * from department;
```

NAME	NUM	MGR_SSN	MGR_START_DATE	DEPT_PHONE_NUM
Manufacture	1	888665555	19-JUN-71	1234567890
Administration	2	543216789	04-JAN-99	987654321
Headquarter	3	554433221	22-SEP-55	1236540987
Finance	4	987654321	01-JAN-85	985673214
Research	5	333445555	22-MAY-78	4125012356

10. Modify the field name of department phone number to PhNo.

Command:

alter table department rename column dept_phone_num to PhNo;

Output:

```
SQL> alter table department rename column dept_phone_num to PhNo;

Table altered.

SQL> select * from department;
```

NAME	NUM	MGR_SSN	MGR_START_DATE	PHNO
Manufacture	1	888665555	19-JUN-71	1234567890
Administration	2	543216789	04-JAN-99	987654321
Headquarter	3	554433221	22-SEP-55	1236540987
Finance	4	987654321	01-JAN-85	985673214
Research	5	333445555	22-MAY-78	4125012356

11. Rename the table department to dept.

Command:

rename department to dept;

Output:

```
SQL> rename department to dept;

Table renamed.

SQL> select * from dept;
```

NAME	NUM	MGR_SSN	MGR_START_DATE	PHNO
Manufacture	1	888665555	19-JUN-71	1234567890
Administration	2	543216789	04-JAN-99	987654321
Headquarter	3	554433221	22-SEP-55	1236540987
Finance	4	987654321	01-JAN-85	985673214
Research	5	333445555	22-MAY-78	4125012356

12. Alter table dept to remove the column PhNo.

Command:

alter table dept drop column PhNo;

Output:

```
SQL> alter table dept drop column PhNo;

Table altered.

SQL> select * from dept;
```

NAME	NUM	MGR_SSN	MGR_START_DATE
Manufacture	1	888665555	19-JUN-71
Administration	2	543216789	04-JAN-99
Headquarter	3	554433221	22-SEP-55
Finance	4	987654321	01-JAN-85
Research	5	333445555	22-MAY-78

13. Create table copyofdept as a copy of dept.

Command:

create table copyofdept as (select * from dept);

Output:

```
SQL> create table copyofdept as (select * from dept);

Table created.

SQL> select * from copyofdept;

NAME                                NUM    MGR_SSN  MGR_START_DATE
-----
Manufacture                        1    888665555 19-JUN-71
Administration                     2    543216789 04-JAN-99
Headquarter                        3    554433221 22-SEP-55
Finance                           4    987654321 01-JAN-85
Research                          5    333445555 22-MAY-78
```

14. Delete all the rows from copyofdept.

Command:

delete from copyofdept;

Output:

```
SQL> delete from copyofdept;

5 rows deleted.

SQL> select * from copyofdept;

no rows selected
```

15. Remove the copyofdept table.

Command:

drop table copyofdept;

Output:

```
SQL> drop table copyofdept;

Table dropped.

SQL> select * from copyofdept;
select * from copyofdept
      *
ERROR at line 1:
ORA-00942: table or view does not exist
```

Exercise – II

Tables and Alterations:

```
create table employee_bds0340( f_name varchar(25) not null, m_name varchar(1), l_name
varchar(25) not null, ssn number(9) not null primary key, bday Date, address varchar(50),
sex varchar(1) check (sex in ('M', 'F', 'm', 'f')), salary number(6) default 800, super_ssn
number(9), dept number(1), constraint emp_sup_ssn_fk foreign key (super_ssn) references
employee_bds0340 (ssn) on delete set null, constraint dept_fk foreign key (dept) references
department_bds0340 (num) on delete cascade );
```

```
create table department_bds0340( name varchar(25) not null, num number(2) primary key,
mgr_ssn number(9), mgr_start_date Date );
```

```
alter table department_bds0340 add constraint mgr_ssn_fk foreign key (mgr_ssn)
references employee_bds0340 (ssn);
```

```
create table project_bds0340( name varchar(2) not null, num number(4) primary key,
location varchar(25), dept number(2), constraints dept_fk foreign key (dept) references
department_bds0340 (num) on delete set null );
```

```
create table dept_location_bds0340( dept_num number(4), dept_loc varchar(15), constraint
d_fk foreign key (dept_num) references department_bds0340 (num) on delete cascade );
```

```
create table works_on_bds0340( emp_ssn number(9), proj_num number(4), hours
decimal(3,1) not null, constraint emp_ssn_fk foreign key (emp_ssn) references
employee_bds0340 (ssn) on delete cascade, constraint proj_num_fk foreign key (proj_num)
references project_bds0340 (num) on delete cascade );
```

```
create table dependent_bds0340( emp_ssn number(9), name varchar(15), sex varchar(1)
check (sex in ('M', 'F', 'm', 'f')), bday Date, relationship varchar(8) );
```

Exercises:

1. Insert ('Robert', 'F', 'Scott', '943775543', '21-JUN-42', '2365 Newcastle Rd, Bellaire, TX', M, 58000, '888665555', 1) into employee.

Command:

```
insert into employee_bds0340 (f_name, m_name, l_name, ssn, bday, address, sex, salary,
super_ssn, dept) values('Robert', 'F', 'Scott', 943775543, '15513', '2365 Newcastle Rd,
Bellaire, TX', 'M', 58000, 888665555, 1);
```

Output:

```
SQL> insert into employee_bds0340 (f_name, m_name, l_name, ssn, bday, address, sex, salary, super
_ssn, dept) values('Robert', 'F', 'Scott', 943775543, '21-Jun-42', '2365 Newcastle Rd, Bellaire,
TX', 'M', 58000, 888665555, 1);

1 row created.
```

2. Insert ('677678989', null, '40.0') into works_on.

Command:

insert into works_on_bds0340 (emp_ssn, proj_num, hours) values (677678989, null, 40);

Output:

```
[SQL> insert into works_on_bds0340 (emp_ssn, proj_num, hours) values (677678989, null, 40);  
insert into works_on_bds0340 (emp_ssn, proj_num, hours) values (677678989, null, 40)  
*  
ERROR at line 1:  
ORA-02291: integrity constraint (SYSTEM.EMP_SSN_FK) violated - parent key not found
```

The employee ssn does not exist in the table employee_bds0340.

3. Insert ('453453453', 'John', 'M', '12-Dec-60', 'Spouse') into dependent.

Command:

insert into dependent_bds0340 (emp_ssn, name, sex, bday, relationship) values
(453453453, 'John', 'M', '12-Dec-60', 'Spouse');

Output:

```
[SQL> insert into dependent_bds0340 (emp_ssn, name, sex, bday, relationship) values (453453453, 'J  
ohn', 'M', '12-Dec-60', 'Spouse');  
  
1 row created.
```

4. Delete the works_on tuples with emp_ssn = 333445555

Command:

delete from works_on_bds0340 where emp_ssn=333445555;

Output:

```
[SQL> delete from works_on_bds0340 where emp_ssn=333445555;
4 rows deleted.]
```

5. Modify the mgr_ssn and mgr_start_date of the department table with dept_num=5 to 123456789 and '01-Oct-88' respectively.

Command:

update department_bds0340 set mgr_ssn=123456789, mgr_start_date='01-Oct-88' where num=5;

Output:

```
[SQL> update department_bds0340 set mgr_ssn=123456789, mgr_start_date='01-Oct-88' where num=5;
1 row updated.]
```

Alter the tables to:

1. Add foreign keys using alter table (already done).
2. Drop foreign key defined on super_ssn and add it using alter table command.

Commands:

alter table employee_bds0340 drop constraint emp_sup_ssn_fk;
alter table employee_bds0340 add constraint emp_sup_ssn_fk foreign key (super_ssn)
references employee_bds0340 (ssn) on delete set null;

Output:

```
[SQL> alter table employee_bds0340 drop constraint emp_sup_ssn_fk;
Table altered.

[SQL> alter table employee_bds0340 add constraint emp_sup_ssn_fk foreign key (super_ssn) references employee_bds0340 (ssn) on delete set null;
Table altered.]
```

3. Make name of project as unique and sex of employee as not null.

Commands:

alter table project_bds0340 modify (name unique);
alter table employee_bds0340 modify (sex not null);

Output:

```
[SQL> alter table project_bds0340 modify (name unique);  
]  
Table altered.  
[SQL> alter table employee_bds0340 modify (sex not null);  
]  
Table altered.
```

4. Make address as a new type containing door number street, city, state, country.

Command:

```
alter table employee_bds0340 drop column address;  
alter table employee_bds0340 add (door_no varchar(10), street varchar(15), city  
varchar(20), state varchar(50), country varchar(50));
```

Output:

```
[SQL> alter table employee_bds0340 drop column address;  
]  
Table altered.  
[SQL> alter table employee_bds0340 add (door_no varchar(10), street varchar(15), city varchar(20)]  
, state varchar(50), country varchar(50));  
]  
Table altered.
```

5. Make salary of employee to accept real values.

Command

```
alter table employee_bds0340 modify (salary float(63));
```

Output:

```
[SQL> alter table employee_bds0340 modify (salary float(63));  
]  
Table altered.
```