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SET UP OF VARIOUS TABLES IN DATABASE

Below is a series of screenshots depicting the MySQL outputs of the constructed tables as well as the results generated after a series of tests of the queries written in python.

TABLE CONSTRAINTS AND KEY COLUMN USAGE

Table constraints

```
mysql> SELECT * FROM INFORMATION_SCHEMA.TABLE_CONSTRAINTS WHERE CONSTRAINT_SCHEMA = "COMPANY_DATABASE";
```

CONSTRAINT_CATALOG	CONSTRAINT_SCHEMA	CONSTRAINT_NAME	TABLE_SCHEMA	TABLE_NAME	CONSTRAINT_TYPE	ENFORCED
def	company_database	Dname	company_database	department	UNIQUE	YES
def	company_database	PRIMARY	company_database	department	PRIMARY KEY	YES
def	company_database	department_ibfk_1	company_database	department	FOREIGN KEY	YES
def	company_database	PRIMARY	company_database	dependent	PRIMARY KEY	YES
def	company_database	dependent_ibfk_1	company_database	dependent	FOREIGN KEY	YES
def	company_database	PRIMARY	company_database	dept_locations	PRIMARY KEY	YES
def	company_database	dept_locations_ibfk_1	company_database	dept_locations	FOREIGN KEY	YES
def	company_database	PRIMARY	company_database	employee	PRIMARY KEY	YES
def	company_database	employee_ibfk_1	company_database	employee	FOREIGN KEY	YES
def	company_database	employee_ibfk_2	company_database	employee	FOREIGN KEY	YES
def	company_database	Pname	company_database	project	UNIQUE	YES
def	company_database	PRIMARY	company_database	project	PRIMARY KEY	YES
def	company_database	project_ibfk_1	company_database	project	FOREIGN KEY	YES
def	company_database	PRIMARY	company_database	works_on	PRIMARY KEY	YES
def	company_database	works_on_ibfk_1	company_database	works_on	FOREIGN KEY	YES
def	company_database	works_on_ibfk_2	company_database	works_on	FOREIGN KEY	YES

16 rows in set (0.00 sec)

Key column usage

```
mysql> SELECT * FROM INFORMATION_SCHEMA.KEY_COLUMN_USAGE WHERE CONSTRAINT_SCHEMA = "COMPANY_DATABASE";
```

CONSTRAINT_CATALOG	CONSTRAINT_SCHEMA	CONSTRAINT_NAME	TABLE_CATALOG	TABLE_SCHEMA	TABLE_NAME	COLUMN_NAME	ORDINAL_POSITION	POSITION_IN_UNIQUE_CONSTRAINT	REFERENCED_TABLE_SCHEMA	REFERENCED_TABLE_NAME	REFERENCED_COLUMN_NAME
def	company_database	Dname	def	company_database	department	Dname	1				
def	company_database	PRIMARY	def	company_database	department	Dnumber	1				
def	company_database	department_ibfk_1	def	company_database	department	Mgr_ssn	1		company_database	employee	Ssn
def	company_database	PRIMARY	def	company_database	dependent	Eson	1				
def	company_database	dependent_ibfk_1	def	company_database	dependent	Dependent_name	2				
def	company_database	PRIMARY	def	company_database	dept_locations	Dnumber	1		company_database	employee	Ssn
def	company_database	PRIMARY	def	company_database	dept_locations	Dlocation	2				
def	company_database	PRIMARY	def	company_database	dept_locations	Dnumber	1		company_database	employee	Ssn
def	company_database	PRIMARY	def	company_database	employee	Ssn	1				
def	company_database	employee_ibfk_1	def	company_database	employee	Super_ssn	1		company_database	employee	Ssn
def	company_database	employee_ibfk_2	def	company_database	employee	Dno	1		company_database	department	Dnumber
def	company_database	Pname	def	company_database	project	Pname	1				
def	company_database	PRIMARY	def	company_database	project	Pnumber	1				
def	company_database	project_ibfk_1	def	company_database	project	Dnum	1		company_database	department	Dnumber
def	company_database	PRIMARY	def	company_database	works_on	Eson	1				
def	company_database	works_on_ibfk_1	def	company_database	works_on	Pno	2				
def	company_database	works_on_ibfk_2	def	company_database	works_on	Eson	1		company_database	employee	Ssn
def	company_database		def	company_database	works_on	Pno	1		company_database	project	Pnumber

16 rows in set (0.00 sec)

EMPLOYEE

```
mysql> SELECT * FROM EMPLOYEE;
```

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000.00	333445555	5
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000.00	888665555	5
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000.00	333445555	5
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000.00	NULL	1
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000.00	888665555	4
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000.00	987654321	4
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000.00	987654321	4

```
8 rows in set (0.00 sec)
```

```
mysql> DESCRIBE EMPLOYEE;
```

Field	Type	Null	Key	Default	Extra
Fname	varchar(15)	NO		NULL	
Minit	char(1)	YES		NULL	
Lname	varchar(15)	NO		NULL	
Ssn	char(9)	NO	PRI	NULL	
Bdate	date	YES		NULL	
Address	varchar(30)	YES		NULL	
Sex	char(1)	YES		NULL	
Salary	decimal(10,2)	YES		NULL	
Super_ssn	char(9)	YES	MUL	NULL	
Dno	int	NO	MUL	NULL	

```
10 rows in set (0.00 sec)
```

DEPARTMENT

```
mysql> SELECT * FROM DEPARTMENT;
```

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

```
3 rows in set (0.00 sec)
```

```
mysql> DESCRIBE DEPARTMENT;
```

Field	Type	Null	Key	Default	Extra
Dname	varchar(15)	NO	UNI	NULL	
Dnumber	int	NO	PRI	NULL	
Mgr_ssn	char(9)	NO	MUL	NULL	
Mgr_start_date	date	YES		NULL	

```
4 rows in set (0.00 sec)
```

DEPT LOCATIONS

```
mysql> SELECT * FROM DEPT_LOCATIONS;
```

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

5 rows in set (0.00 sec)

```
mysql> DESCRIBE DEPT_LOCATIONS;
```

Field	Type	Null	Key	Default	Extra
Dnumber	int	NO	PRI	NULL	
Dlocation	varchar(15)	NO	PRI	NULL	

2 rows in set (0.00 sec)

PROJECT

```
mysql> SELECT * FROM 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

6 rows in set (0.00 sec)

```
mysql> DESCRIBE PROJECT  
-> ;
```

Field	Type	Null	Key	Default	Extra
Pname	varchar(15)	NO	UNI	NULL	
Pnumber	int	NO	PRI	NULL	
Plocation	varchar(15)	YES		NULL	
Dnum	int	NO	MUL	NULL	

4 rows in set (0.00 sec)

WORKS_ON

```
mysql> SELECT * FROM WORKS_ON;
```

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

```
16 rows in set (0.00 sec)
```

```
mysql> DESCRIBE WORKS_ON;
```

Field	Type	Null	Key	Default	Extra
Essn	char(9)	NO	PRI	NULL	
Pno	int	NO	PRI	NULL	
HOURS	decimal(3,1)	YES		NULL	

```
3 rows in set (0.00 sec)
```

DEPENDENT

```
mysql> SELECT * FROM DEPENDENT;
```

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

```
7 rows in set (0.00 sec)
```

```
mysql> DESCRIBE DEPENDENT;
```

Field	Type	Null	Key	Default	Extra
Essn	char(9)	NO	PRI	NULL	
Dependent_name	varchar(15)	NO	PRI	NULL	
Sex	char(1)	YES		NULL	
Bdate	date	YES		NULL	
Relationship	varchar(8)	YES		NULL	

```
5 rows in set (0.00 sec)
```

EXECUTION OF MySQL PYTHON QUERIES

Basic add new employee:

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 1
Enter First Name: Elijah
Enter Middle Initial: L
Enter Last Name: Rodriguez
Enter ssn: 000000000
Enter Birth date (yyyy-mm-dd): 2000-08-01
Enter address: 123 uconn rd, storrs, ct
Enter sex: M
Enter salary: 12345
Enter superssn: 333445555
Enter dno: 5
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 2
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '123 uconn rd, storrs, ct', 'M', Decimal('12345.00'), '333445555', 5, 'Franklin', 'T', 'Mong', 'Research', None)
Return to Menu? (y/n)_
```

- Constraint violation testing:

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 1
Enter First Name: Elijah
Enter Middle Initial: L
Enter Last Name: Rodriguez
Enter ssn: 000000000
Enter Birth date (yyyy-mm-dd): 2000-08-01
Enter address: 123 uconn rd, storrs, ct
Enter sex: M
Enter salary: 12345
Enter superssn: 000000001
Enter dno: 5
Error: 1452 (23000): Cannot add or update a child row: a foreign key constraint fails ('company_database`.`employee`, CONSTRAINT `employee_ibfk_1` FOREIGN KEY (`Super_ssn`) REFERENCES `employee` (`Ssn`))
Return to Menu? (y/n)
```

View employee with Dependent:

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 2
Enter Employee Ssn: 333445555
('Franklin', 'T', 'Mong', '333445555', datetime.date(1955, 12, 8), '638 Voss, Houston, TX', 'M', Decimal('40000.00'), '888665555', 5, 'James', 'E', 'Borg', 'Research', 'Joy')
('Franklin', 'T', 'Mong', '333445555', datetime.date(1955, 12, 8), '638 Voss, Houston, TX', 'M', Decimal('40000.00'), '888665555', 5, 'James', 'E', 'Borg', 'Research', 'Theodore')
Return to Menu? (y/n)_
```

View employee without Dependent:

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 2
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '123 uconn rd, storrs, ct', 'M', Decimal('12345.00'), '333445555', 5, 'Franklin', 'T', 'Wong', 'Research', None)
Return to Menu? (y/n)
```

Address modification Functionality :

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 2
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '123 uconn rd, storrs, ct', 'M', Decimal('12345.00'), '333445555', 5, 'Franklin', 'T', 'Wong', 'Research', None)
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 3
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '123 uconn rd, storrs, ct', 'M', Decimal('12345.00'), '333445555', 5)
Enter what field you would like to modify (address, sex, salary, super_ssn, or Dno): address
Enter Updated Address: 1 storrs rd, storrs, ct
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 2
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '1 storrs rd, storrs, ct', 'M', Decimal('12345.00'), '333445555', 5, 'Franklin', 'T', 'Wong', 'Research', None)
Return to Menu? (y/n)
```

Sex modification Functionality:

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 2
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '1 storrs rd, storrs, ct', 'M', Decimal('12345.00'), '333445555', 5, 'Franklin', 'T', 'Wong', 'Research', None)
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 3
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '1 storrs rd, storrs, ct', 'M', Decimal('12345.00'), '333445555', 5)
Enter what field you would like to modify (address, sex, salary, super_ssn, or Dno): sex
Enter Updated Sex: F
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 2
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '1 storrs rd, storrs, ct', 'F', Decimal('12345.00'), '333445555', 5, 'Franklin', 'T', 'Wong', 'Research', None)
Return to Menu? (y/n)_
```

Salary modification functionality:

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 2
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '1 storrs rd, storrs, ct', 'F', Decimal('12345.00'), '333445555', 5, 'Franklin', 'T', 'Wong', 'Research', None)
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 3
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '1 storrs rd, storrs, ct', 'F', Decimal('12345.00'), '333445555', 5)
Enter what field you would like to modify (address, sex, salary, super_ssn, or Dno): salary
Enter Updated Salary: 99999
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 2
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '1 storrs rd, storrs, ct', 'F', Decimal('99999.00'), '333445555', 5, 'Franklin', 'T', 'Wong', 'Research', None)
Return to Menu? (y/n)
```


Functionality for super ssn modification functionality :

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 2
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '1 storrs rd, storrs, ct', 'F', Decimal('99999.00'), '333445555', 5, 'Franklin', 'T', 'Wong', 'Research', None)
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 3
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '1 storrs rd, storrs, ct', 'F', Decimal('99999.00'), '333445555', 5)
Enter what field you would like to modify (address, sex, salary, super_ssn, or Dno): super_ssn
Enter Updated Super_ssn: 888665555
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 2
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '1 storrs rd, storrs, ct', 'F', Decimal('99999.00'), '888665555', 5, 'James', 'E', 'Borg', 'Research', None)
```

Functionality for dno modification functionality :

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 2
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '1 storrs rd, storrs, ct', 'F', Decimal('99999.00'), '888665555', 5, 'James', 'E', 'Borg', 'Research', None)
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 3
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '1 storrs rd, storrs, ct', 'F', Decimal('99999.00'), '888665555', 5)
Enter what field you would like to modify (address, sex, salary, super_ssn, or Dno): dno
Enter Updated Department Number: 1
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 2
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '1 storrs rd, storrs, ct', 'F', Decimal('99999.00'), '888665555', 1, 'James', 'E', 'Borg', 'Headquarters', None)
Return to Menu? (y/n)
```

- Lock testing:

Database Options: 1. Add New Employee 2. View Employee 3. Modify Employee 4. Remove Employee 5. Add New Dependent 6. Remove Dependent 7. Add new Department 8. View Department 9. Remove Department 10. Add Department Location 11. Remove Department Location Enter Option Number: 3 Enter Employee Ssn: 000000000 ('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '1 storrs rd, storrs, ct', 'F', Decimal('99999.00'), '888665555', 1) Enter what field you would like to modify (address, sex, salary, super_ssn, or Dno):	Database Options: 1. Add New Employee 2. View Employee 3. Modify Employee 4. Remove Employee 5. Add New Dependent 6. Remove Dependent 7. Add new Department 8. View Department 9. Remove Department 10. Add Department Location 11. Remove Department Location Enter Option Number: 3 Enter Employee Ssn: 000000000
---	--

- Left instance entered ssn first preventing right instance from continuing with the function

Database Options: 1. Add New Employee 2. View Employee 3. Modify Employee 4. Remove Employee 5. Add New Dependent 6. Remove Dependent 7. Add new Department 8. View Department 9. Remove Department 10. Add Department Location 11. Remove Department Location Enter Option Number: 3 Enter Employee Ssn: 000000000 ('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '1 storrs rd, storrs, ct', 'M', Decimal('99999.00'), '888665555', 1) Enter what field you would like to modify (address, sex, salary, super_ssn, or Dno): sex Enter Updated Sex: M Return to Menu? (y/n)y	Database Options: 1. Add New Employee 2. View Employee 3. Modify Employee 4. Remove Employee 5. Add New Dependent 6. Remove Dependent 7. Add new Department 8. View Department 9. Remove Department 10. Add Department Location 11. Remove Department Location Enter Option Number: 3 Enter Employee Ssn: 000000000 ('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '1 storrs rd, storrs, ct', 'M', Decimal('99999.00'), '888665555', 1) Enter what field you would like to modify (address, sex, salary, super_ssn, or Dno):
---	---

- After left instance was resolved right instance was able to move forward with modify function

[illegible]

- Lock testing:

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 4
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '00000000', datetime.date(2000, 8, 1), '123 husky circle storrs ct', 'M', Decimal('9999
9.00'), '333445555', 5)
Are you sure you would like to delete this employee? (y/n):
```

- Left instance entered ssn first preventing right instance from continuing with the function

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 4
Enter Employee Ssn: 000000000
('Elijah', 'L', 'Rodriguez', '000000000', datetime.date(2000, 8, 1), '123 husky circle storns ct', 'M', Decimal('9999
9.00'), 13141655, 5)
Are you sure you would like to delete this employee? (y/n): y
Return to Menu? (y/n)
```

- After left instance was resolved right instance was able to move forward with modify function

- Constraint Violation testing:

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 4
Enter Employee Ssn: 333445555
('Franklin', 'T', 'Wong', '333445555', datetime.date(1955, 12, 8), '638 Voss, Houston, TX', 'M', Decimal('40000.00'), '888665555', 5)
Are you sure you would like to delete this employee? (y/n) y
Error: 1451 (23000): Cannot delete or update a parent row: a foreign key constraint fails ('company_database','department', CONSTRAINT 'department_ibfk_1' FOREIGN KEY ('Mgr_ssn') REFERENCES 'employee' ('Ssn'))
Return to Menu? (y/n)
```

Add new dependent functionality:

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 2
Enter Employee Ssn: 333445555
('Franklin', 'T', 'Wong', '333445555', datetime.date(1955, 12, 8), '638 Voss, Houston, TX', 'M', Decimal('40000.00'), '888665555', 5, 'James', 'E', 'Borg', 'Research', 'Joy')
('Franklin', 'T', 'Wong', '333445555', datetime.date(1955, 12, 8), '638 Voss, Houston, TX', 'M', Decimal('40000.00'), '888665555', 5, 'James', 'E', 'Borg', 'Research', 'Theodore')
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 5
Enter Employee Ssn: 333445555
('Joy', 'F', datetime.date(1958, 5, 3), 'Spouse')
('Theodore', 'M', datetime.date(1983, 10, 25), 'Son')
Enter New Dependent Name: Elijah
Enter New Dependent Sex: M
Enter New Dependent Birth Date: 2000-08-01
Enter New Dependent Relationship: Son
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 2
Enter Employee Ssn: 333445555
('Franklin', 'T', 'Wong', '333445555', datetime.date(1955, 12, 8), '638 Voss, Houston, TX', 'M', Decimal('40000.00'), '888665555', 5, 'James', 'E', 'Borg', 'Research', 'Elijah')
('Franklin', 'T', 'Wong', '333445555', datetime.date(1955, 12, 8), '638 Voss, Houston, TX', 'M', Decimal('40000.00'), '888665555', 5, 'James', 'E', 'Borg', 'Research', 'Joy')
('Franklin', 'T', 'Wong', '333445555', datetime.date(1955, 12, 8), '638 Voss, Houston, TX', 'M', Decimal('40000.00'), '888665555', 5, 'James', 'E', 'Borg', 'Research', 'Theodore')
Return to Menu? (y/n)_
```

- Lock testing:

<pre>Database Options: 1. Add New Employee 2. View Employee 3. Modify Employee 4. Remove Employee 5. Add New Dependent 6. Remove Dependent 7. Add new Department 8. View Department 9. Remove Department 10. Add Department Location 11. Remove Department Location Enter Option Number: 5 Enter Employee Ssn: 333445555 ('Elijah', 'M', datetime.date(2000, 8, 1), 'Son') ('Joy', 'F', datetime.date(1958, 5, 3), 'Spouse') ('Theodore', 'M', datetime.date(1983, 10, 25), 'Son') Enter New Dependent Name:</pre>	<pre>Database Options: 1. Add New Employee 2. View Employee 3. Modify Employee 4. Remove Employee 5. Add New Dependent 6. Remove Dependent 7. Add new Department 8. View Department 9. Remove Department 10. Add Department Location 11. Remove Department Location Enter Option Number: 5 Enter Employee Ssn: 333445555</pre>
--	--

- Left instance entered ssn first preventing right instance from continuing with the function

<pre>Database Options: 1. Add New Employee 2. View Employee 3. Modify Employee 4. Remove Employee 5. Add New Dependent 6. Remove Dependent 7. Add new Department 8. View Department 9. Remove Department 10. Add Department Location 11. Remove Department Location Enter Option Number: 5 Enter Employee Ssn: 333445555 ('Joy', 'F', datetime.date(1958, 5, 3), 'Spouse') ('Theodore', 'M', datetime.date(1983, 10, 25), 'Son') Enter New Dependent Name: Elijah Enter New Dependent Sex: M Enter New Dependent Birth Date: 2000-08-01 Enter New Dependent Relationship: Son Return to Menu? (y/n)</pre>	<pre>Database Options: 1. Add New Employee 2. View Employee 3. Modify Employee 4. Remove Employee 5. Add New Dependent 6. Remove Dependent 7. Add new Department 8. View Department 9. Remove Department 10. Add Department Location 11. Remove Department Location Enter Option Number: 5 Enter Employee Ssn: 333445555 ('Elijah', 'M', datetime.date(2000, 8, 1), 'Son') ('Joy', 'F', datetime.date(1958, 5, 3), 'Spouse') ('Theodore', 'M', datetime.date(1983, 10, 25), 'Son') Enter New Dependent Name:</pre>
---	--

- After left instance was resolved right instance was able to move forward with modify function

Remove dependent functionality:

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 2
Enter Employee Ssn: 333445555
('Franklin', 'T', 'Mong', '333445555', datetime.date(1955, 12, 8), '638 Voss, Houston, TX', 'M', Decimal('40000.00'), '888665555', 5, 'James', 'E', 'Borg', 'Research', 'Elijah')
('Franklin', 'T', 'Mong', '333445555', datetime.date(1955, 12, 8), '638 Voss, Houston, TX', 'M', Decimal('40000.00'), '888665555', 5, 'James', 'E', 'Borg', 'Research', 'Joy')
('Franklin', 'T', 'Mong', '333445555', datetime.date(1955, 12, 8), '638 Voss, Houston, TX', 'M', Decimal('40000.00'), '888665555', 5, 'James', 'E', 'Borg', 'Research', 'Theodore')
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 6
Enter Employee Ssn: 333445555
('Elijah', 'M', datetime.date(2000, 8, 1), 'Son')
('Joy', 'F', datetime.date(1958, 5, 3), 'Spouse')
('Theodore', 'M', datetime.date(1983, 10, 25), 'Son')
Enter name of Dependent to be Removed: Elijah
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 2
Enter Employee Ssn: 333445555
('Franklin', 'T', 'Mong', '333445555', datetime.date(1955, 12, 8), '638 Voss, Houston, TX', 'M', Decimal('40000.00'), '888665555', 5, 'James', 'E', 'Borg', 'Research', 'Joy')
('Franklin', 'T', 'Mong', '333445555', datetime.date(1955, 12, 8), '638 Voss, Houston, TX', 'M', Decimal('40000.00'), '888665555', 5, 'James', 'E', 'Borg', 'Research', 'Theodore')
Return to Menu? (y/n)_
```

- Lock testing:

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 6
Enter Employee Ssn: 333445555
('Elijah', 'M', datetime.date(2000, 8, 1), 'Son')
('Jonathan', 'M', datetime.date(2000, 7, 1), 'Son')
('Joy', 'F', datetime.date(1958, 5, 3), 'Spouse')
('Theodore', 'M', datetime.date(1983, 10, 25), 'Son')
Enter name of Dependent to be Removed:

Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 6
Enter Employee Ssn: 333445555
```

- Left instance entered ssn first preventing right instance from continuing with the function

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 6
Enter Employee Ssn: 333445555
('Elijah', 'M', datetime.date(2000, 8, 1), 'Son')
('Jonathan', 'M', datetime.date(2000, 7, 1), 'Son')
('Joy', 'F', datetime.date(1958, 5, 3), 'Spouse')
('Theodore', 'M', datetime.date(1983, 10, 25), 'Son')
Enter name of Dependent to be Removed: Jonathan
Return to Menu? (y/n)_

Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 6
Enter Employee Ssn: 333445555
('Elijah', 'M', datetime.date(2000, 8, 1), 'Son')
('Joy', 'F', datetime.date(1958, 5, 3), 'Spouse')
('Theodore', 'M', datetime.date(1983, 10, 25), 'Son')
Enter name of Dependent to be Removed:
```

- After left instance was resolved right instance was able to move forward with modify function

Add new department functionality

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 7
Enter Department Name: Engineering
Enter Department Number: 2
Enter Manager SSN: 333445555
Enter Manager Start Date: 1990-08-01
Return to Menu? (y/n)y
```

- Constraint violation testing:

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 7
Enter Department Name: Analytics
Enter Department Number: 5
Enter Manager SSN: 123456789
Enter Manager Start Date: 1999-12-31
Error: 1062 (23000): Duplicate entry '5' for key 'department.PRIMARY'
Return to Menu? (y/n)
```

View Department functionality:

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 8
Enter Department number: 5
('Research', 'Franklin', 'T', 'Wong', 'Bellaire')
('Research', 'Franklin', 'T', 'Wong', 'Houston')
('Research', 'Franklin', 'T', 'Wong', 'Sugarland')
Return to Menu? (y/n)
```

Remove department functionality:

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 9
Enter Department number: 2
('Engineering', 2, '333445555', datetime.date(1990, 8, 1))
Are you sure you would like to delete this Department? (y/n): y
Return to Menu? (y/n)
```

- Lock Testing:

<pre>Database Options: 1. Add New Employee 2. View Employee 3. Modify Employee 4. Remove Employee 5. Add New Dependent 6. Remove Dependent 7. Add new Department 8. View Department 9. Remove Department 10. Add Department Location 11. Remove Department Location Enter Option Number: 9 Enter Department number: 2 ('Engineering', 2, '123456789', datetime.date(1999, 12, 31)) Are you sure you would like to delete this Department? (y/n):</pre>	<pre>Database Options: 1. Add New Employee 2. View Employee 3. Modify Employee 4. Remove Employee 5. Add New Dependent 6. Remove Dependent 7. Add new Department 8. View Department 9. Remove Department 10. Add Department Location 11. Remove Department Location Enter Option Number: 9 Enter Department number: 2</pre>
--	---

- Left instance entered dnum first preventing right instance from continuing with the function

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 9
Enter Department number: 2
('Engineering', 2, '123456789', datetime.date(1999, 12, 31))
Are you sure you would like to delete this Department? (y/n):
```

- After left instance finished and didn't delete the department, the right instance continued
- Constraint violation testing:

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 9
Enter Department number: 5
('Research', 5, '333445555', datetime.date(1988, 5, 22))
Are you sure you would like to delete this Department? (y/n): y
Error: 1451 (23000): Cannot delete or update a parent row: a foreign key constraint fails ('company_database','dept_locations', CONSTRAINT 'dept_locations_ibfk_1' FOREIGN KEY ('Dnumber') REFERENCES 'department' ('Dnumber'))
Please Resolve Any Referential Integrity Constraint Violations Before Trying To Remove This Department.
Return to Menu? (y/n)
```

Add department location functionality:

```
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 10
Enter Department number: 5
('Bellaire',)
('Houston',)
('Sugarland',)
Enter New Location: Boston
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 8
Enter Department number: 5
('Research', 'Franklin', 'T', 'Wong', 'Bellaire')
('Research', 'Franklin', 'T', 'Wong', 'Boston')
('Research', 'Franklin', 'T', 'Wong', 'Houston')
('Research', 'Franklin', 'T', 'Wong', 'Sugarland')
Return to Menu? (y/n)
```

- Lock Testing:

<pre>Database Options: 1. Add New Employee 2. View Employee 3. Modify Employee 4. Remove Employee 5. Add New Dependent 6. Remove Dependent 7. Add new Department 8. View Department 9. Remove Department 10. Add Department Location 11. Remove Department Location Enter Option Number: 10 Enter Department number: 5 ('Bellaire',) ('Houston',) ('Sugarland',) Enter New Location:</pre>	<pre>Database Options: 1. Add New Employee 2. View Employee 3. Modify Employee 4. Remove Employee 5. Add New Dependent 6. Remove Dependent 7. Add new Department 8. View Department 9. Remove Department 10. Add Department Location 11. Remove Department Location Enter Option Number: 10 Enter Department number: 5</pre>
--	--

- Left instance entered dnum first preventing right instance from continuing with the function

```

Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 10
Enter Department number: 5
('Bellaire',)
('Houston',)
('Sugarland',)
Enter New Location: Boston
Return to Menu? (y/n)

Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 10
Enter Department number: 5
('Bellaire',)
('Boston',)
('Houston',)
('Sugarland',)
Enter New Location:

```

- After left instance finished and didn't delete the department, the right instance continued

Remove department location functionality:

```

Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 8
Enter Department number: 5
('Research', 'Franklin', 'T', 'Wong', 'Bellaire')
('Research', 'Franklin', 'T', 'Wong', 'Boston')
('Research', 'Franklin', 'T', 'Wong', 'Houston')
('Research', 'Franklin', 'T', 'Wong', 'Sugarland')
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 11
Enter Department number: 5
('Bellaire',)
('Boston',)
('Houston',)
('Sugarland',)
Select Department Location To Be Removed: Boston
Return to Menu? (y/n)y
Database Options:
1. Add New Employee
2. View Employee
3. Modify Employee
4. Remove Employee
5. Add New Dependent
6. Remove Dependent
7. Add new Department
8. View Department
9. Remove Department
10. Add Department Location
11. Remove Department Location
Enter Option Number: 8
Enter Department number: 5
('Research', 'Franklin', 'T', 'Wong', 'Bellaire')
('Research', 'Franklin', 'T', 'Wong', 'Houston')
('Research', 'Franklin', 'T', 'Wong', 'Sugarland')
Return to Menu? (y/n)

```

- Lock Testing:

<pre> Database Options: 1. Add New Employee 2. View Employee 3. Modify Employee 4. Remove Employee 5. Add New Dependent 6. Remove Dependent 7. Add new Department 8. View Department 9. Remove Department 10. Add Department Location 11. Remove Department Location Enter Option Number: 11 Enter Department number: 5 ('Bellaire',) ('Boston',) ('Houston',) ('Sugarland',) Select Department Location To Be Removed: </pre>	<pre> Database Options: 1. Add New Employee 2. View Employee 3. Modify Employee 4. Remove Employee 5. Add New Dependent 6. Remove Dependent 7. Add new Department 8. View Department 9. Remove Department 10. Add Department Location 11. Remove Department Location Enter Option Number: 11 Enter Department number: 5 </pre>
--	--

- Left instance entered dnum first preventing right instance from continuing with the function

<pre> Database Options: 1. Add New Employee 2. View Employee 3. Modify Employee 4. Remove Employee 5. Add New Dependent 6. Remove Dependent 7. Add new Department 8. View Department 9. Remove Department 10. Add Department Location 11. Remove Department Location Enter Option Number: 11 Enter Department number: 5 ('Bellaire',) ('Boston',) ('Houston',) ('Sugarland',) Select Department Location To Be Removed: Boston Return to Menu? (y/n) </pre>	<pre> Database Options: 1. Add New Employee 2. View Employee 3. Modify Employee 4. Remove Employee 5. Add New Dependent 6. Remove Dependent 7. Add new Department 8. View Department 9. Remove Department 10. Add Department Location 11. Remove Department Location Enter Option Number: 11 Enter Department number: 5 ('Bellaire',) ('Houston',) ('Sugarland',) Select Department Location To Be Removed: </pre>
---	--

- After left instance finished and didn't delete the department, the right instance continued