

Database Application

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Application Overview



This application allows users to modify and view entities in a database.



Application Features

- Multi-User Support
- Ability to modify and view entries
- detection of Integrity constraint violations

Relational Database Schema

EMPLOYEE

Fname	Minit	Lname	<u>Ssn</u>	Bdate	Address	Sex	Salary	Super_ssn	Dno
-------	-------	-------	------------	-------	---------	-----	--------	-----------	-----

DEPARTMENT

Dname	<u>Dnumber</u>	Mgr_ssn	Mgr_start_date
-------	----------------	---------	----------------

DEPT_LOCATIONS

<u>Dnumber</u>	<u>Dlocation</u>
----------------	------------------

PROJECT

Pname	<u>Pnumber</u>	Plocation	Dnum
-------	----------------	-----------	------

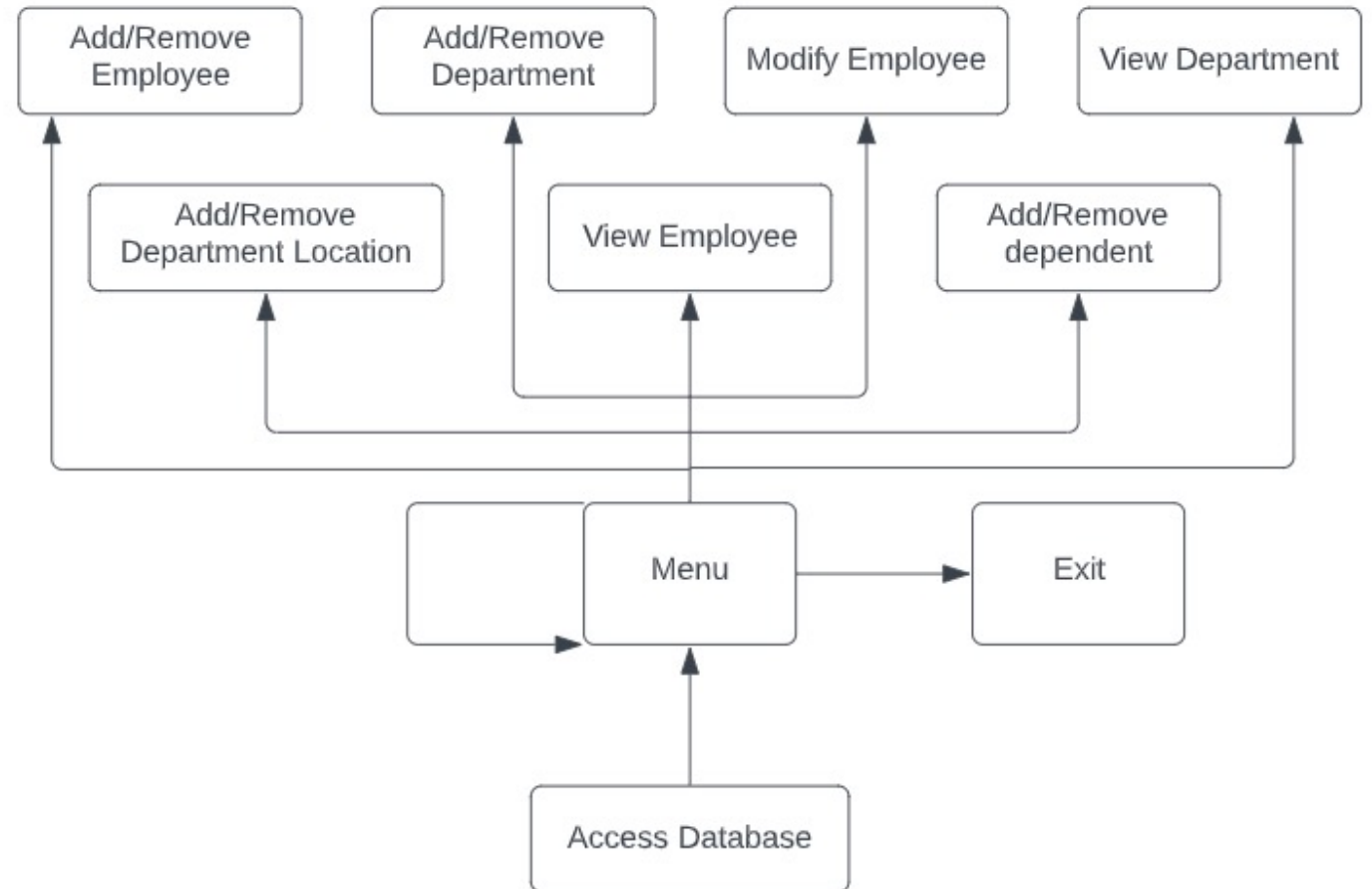
WORKS_ON

<u>Essn</u>	<u>Pno</u>	Hours
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DEPENDENT

<u>Essn</u>	<u>Dependent_name</u>	Sex	Bdate	Relationship
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Architecture Diagram



Creating the Database

```
create database Company;|
CREATE TABLE EMPLOYEE
    (Fname VARCHAR(15) NOT NULL,
    Minit CHAR,
    Lname VARCHAR(15) NOT NULL,
    Ssn CHAR(9) NOT NULL,
    Bdate DATE,
    Address VARCHAR(30),
    Sex CHAR,
    Salary DECIMAL(10,2),
    Super_ssn CHAR(9),
    Dno INT NOT NULL,
    PRIMARY KEY (Ssn)
    );
```

```
CREATE TABLE DEPARTMENT
    (Dname VARCHAR(15) NOT NULL,
    Dnumber INT NOT NULL,
    Mgr_ssn CHAR(9) NOT NULL,
    Mgr_start_date DATE,
    PRIMARY KEY (Dnumber),
    UNIQUE (Dname)
    );
```

```
CREATE TABLE DEPT_LOCATIONS
    (Dnumber INT NOT NULL,
    Dlocation VARCHAR(15) NOT NULL,
    PRIMARY KEY (Dnumber, Dlocation)
    );
```

```
CREATE TABLE PROJECT
    (Pname VARCHAR(15) NOT NULL,
    Pnumber INT NOT NULL,
    Plocation VARCHAR(15),
    Dnum INT NOT NULL,
    PRIMARY KEY (Pnumber),
    UNIQUE (Pname)
    );
```

```
CREATE TABLE WORKS_ON
    (Essn CHAR(9) NOT NULL,
    Pno INT NOT NULL,
    Hours DECIMAL(3,1) NOT NULL,
    PRIMARY KEY (Essn, Pno)
    );
```

```
CREATE TABLE DEPENDENT
    (Essn CHAR(9) NOT NULL,
    Dependent_name VARCHAR(15) NOT NULL,
    Sex CHAR,
    Bdate DATE,
    Relationship VARCHAR(8),
    PRIMARY KEY (Essn, Dependent_name)
    );
```

Adding Constraints

```
ALTER TABLE PROJECT
ADD CONSTRAINT PROJDEPTFK
FOREIGN KEY (Dnum) REFERENCES DEPARTMENT(Dnumber)
    ON DELETE CASCADE ON UPDATE CASCADE;
```

```
ALTER TABLE WORKS_ON
ADD CONSTRAINT WRKONPROJFK
FOREIGN KEY (Pno) REFERENCES PROJECT(Pnumber)
    ON DELETE CASCADE ON UPDATE CASCADE;
```

```
ALTER TABLE WORKS_ON
ADD CONSTRAINT WRKONEMPFK
FOREIGN KEY (Essn) REFERENCES EMPLOYEE(Ssn)
    ON DELETE CASCADE ON UPDATE CASCADE;
```

```
ALTER TABLE DEPENDENT
ADD CONSTRAINT DEPEMPFK
FOREIGN KEY (Essn) REFERENCES EMPLOYEE(Ssn)
    ON DELETE CASCADE ON UPDATE CASCADE;
```

```
ALTER TABLE EMPLOYEE
ADD CONSTRAINT EMPSUPERFK
FOREIGN KEY (Super_ssn) REFERENCES EMPLOYEE (Ssn)
    ON DELETE SET NULL ON UPDATE CASCADE;
```

```
ALTER TABLE EMPLOYEE
ADD CONSTRAINT EMPDEPTFK
FOREIGN KEY(Dno) REFERENCES DEPARTMENT(Dnumber)
    ON DELETE SET DEFAULT ON UPDATE CASCADE;
```

```
ALTER TABLE DEPARTMENT
ADD CONSTRAINT DEPTMGRFK
FOREIGN KEY (Mgr_ssn) REFERENCES EMPLOYEE(Ssn)
    ON DELETE SET DEFAULT ON UPDATE CASCADE;
```

```
ALTER TABLE DEPT_LOCATIONS
ADD CONSTRAINT DLOCDEPTFK
FOREIGN KEY (Dnumber) REFERENCES DEPARTMENT(Dnumber)
    ON DELETE CASCADE ON UPDATE CASCADE;
```

Demo



Menu

Select an option:

- (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
- (12)--Exit program

Enter an option:


```
Enter an option: 2
Enter an employee ssn: 123456789
```

Employee Information

```
-----
First name: John
Middle initial: B
Last name: Smith
SSN:123456789
Birth date: 1965-01-09
Address: 731 Fondren, Houston, TX
Sex: M
Salary: $30000.00
Supervisor SSN: 333445555
Department number: 5
```

Supervisor Name

```
-----
First name: Franklin
Middle initial: T
Last name: Wong
```

Department Name

```
-----
Department Name: Research
```

Dependents

```
-----
('123456789', 'Alice', 'F', datetime.date(1988, 12, 30), 'Daughter')
('123456789', 'Elizabeth', 'F', datetime.date(1967, 5, 5), 'Spouse')
('123456789', 'Michael', 'M', datetime.date(1988, 1, 4), 'Son')
```

Employee info

```
Employee_ssn = input("Enter an employee ssn: ")
Query = "select * from EMPLOYEE WHERE Ssn = %s"
mycursor.execute(Query, (Employee_ssn,))
result = mycursor.fetchall()
```

Supervisor Name

```
Query = "select Fname, Minit, Lname from EMPLOYEE WHERE Ssn = %s"
mycursor.execute(Query, (Super_ssn,))
result = mycursor.fetchall()
```

Department Name

```
Query = "select Dname from DEPARTMENT WHERE Dnumber = %s"
mycursor.execute(Query, (Dno,))
result = mycursor.fetchall()
```

Dependents

```
Query = "select * from DEPENDENT WHERE Essn = %s"
mycursor.execute(Query, (Ssn,))
result = mycursor.fetchall()
```

View Employee info

Add A new Department Location

```
Enter an option: 10
Enter the department number: 5

List of Department Locations
-----
(5, 'Bellaire')
(5, 'Houston')
(5, 'Sugarland')

Enter a new location: New York
```

```
Enter an option: 8
Enter the Department number: 5

Department Manager
-----
First name: Franklin
Middle intial: T
last name: Wong

All locations
-----
Bellaire
Houston
New York
Sugarland
```

```
# Ask for Dnumber
Dnumber = input("Enter the department number: ")
Query = ("SELECT * FROM DEPARTMENT WHERE Dnumber = %s FOR UPDATE")
mycursor.execute(Query, (Dnumber, ))
result = mycursor.fetchall()
```

```
# Show all locations
Query = ("SELECT * FROM DEPT_LOCATIONS WHERE Dnumber = %s")
mycursor.execute(Query, (Dnumber, ))
result = mycursor.fetchall()
```

```
New_location = input("Enter a new location: ")
# Create a new location record and insert into the database
Insert_New_Dlocation = (
    """INSERT INTO DEPT_LOCATIONS (Dnumber, Dlocation)
    VALUES (%s, %s)"""
)
mycursor.execute(Insert_New_Dlocation, (Dnumber, New_location))
database.commit()
```