CIS 430: Lab Assignment 2_2

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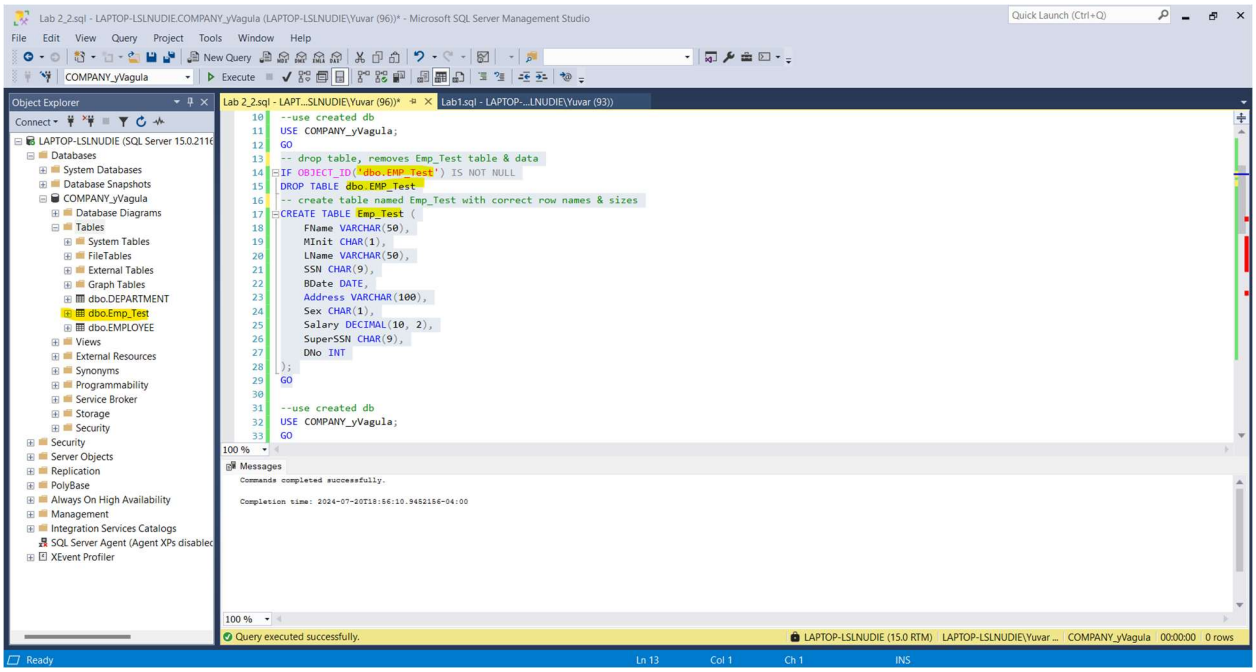
Object: Creating a Relational Database Schema Using SQL and SQL Server

PART 1

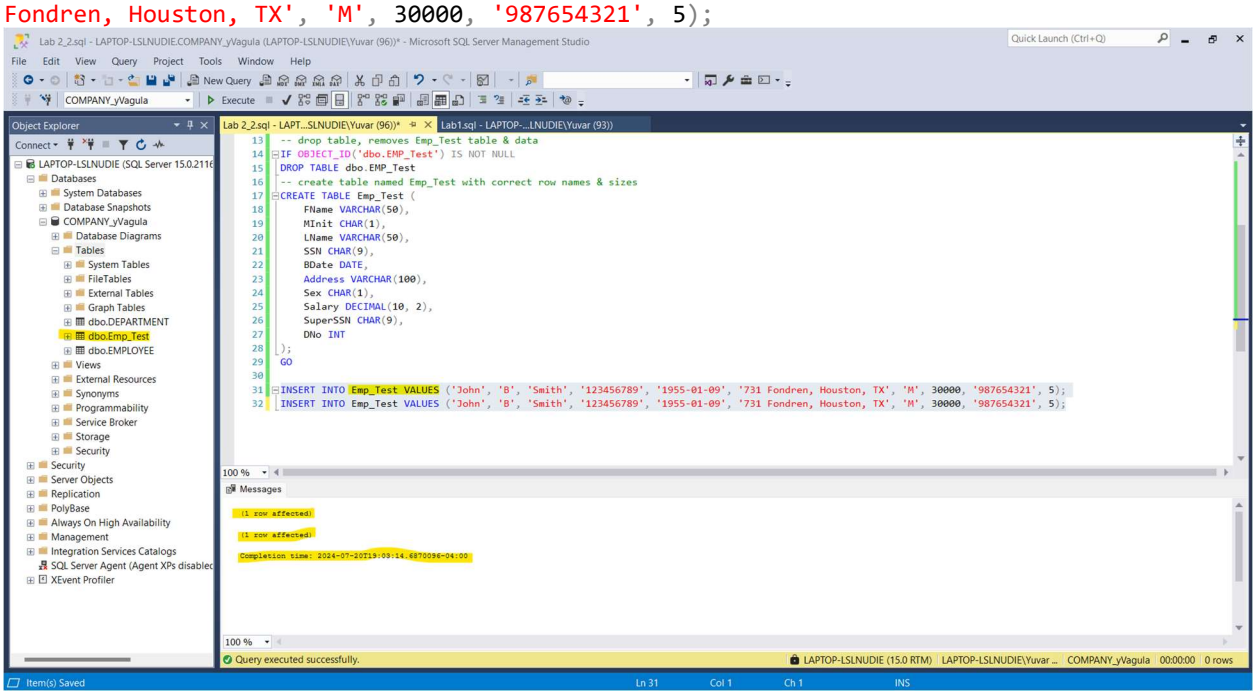
1. Create the test table, **Emp_Test**

```
-- drop table, removes Emp_Test table & data
IF OBJECT_ID('dbo.EMP_Test') IS NOT NULL
DROP TABLE dbo.EMP_Test
-- create table named Emp_Test with correct row names & sizes
CREATE TABLE Emp_Test (
    FName VARCHAR(50),
    MInit CHAR(1),
    LName VARCHAR(50),
    SSN CHAR(9),
    BDate DATE,
    Address VARCHAR(100),
    Sex CHAR(1),
    Salary DECIMAL(10, 2),
    SuperSSN CHAR(9),
    DNo INT
);GO
```



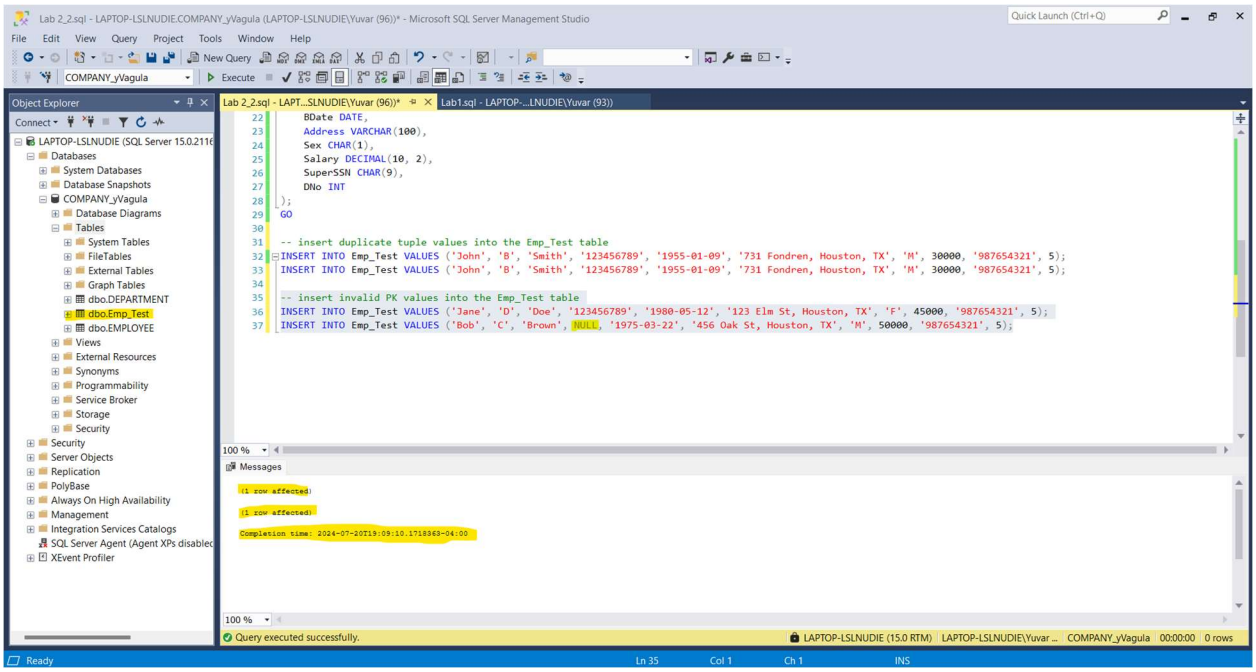
2. Insert a **duplicate tuple** into the **Emp_Test** table

```
INSERT INTO Emp_Test VALUES ('John', 'B', 'Smith', '123456789', '1955-01-09', '731
Fondren, Houston, TX', 'M', 30000, '987654321', 5);
    INSERT INTO Emp_Test VALUES ('John', 'B', 'Smith', '123456789', '1955-01-09', '731
    Fondren, Houston, TX', 'M', 30000, '987654321', 5);
```



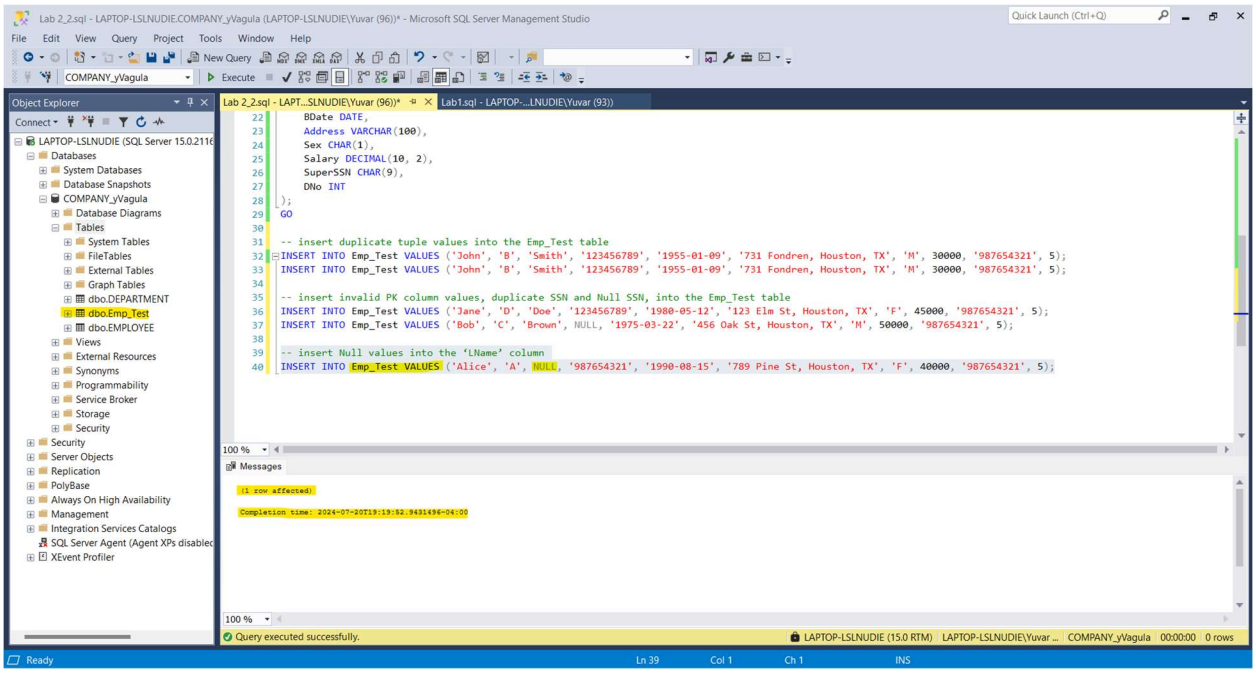
3. Insert **invalid PK column values**, duplicate SSN and Null SSN, into the **Emp_Test** table

```
-- insert invalid PK values into the Emp_Test table
INSERT INTO Emp_Test VALUES ('Jane', 'D', 'Doe', '123456789', '1980-05-12', '123 Elm St, Houston, TX', 'F', 45000, '987654321', 5);
INSERT INTO Emp_Test VALUES ('Bob', 'C', 'Brown', NULL, '1975-03-22', '456 Oak St, Houston, TX', 'M', 50000, '987654321', 5);
```



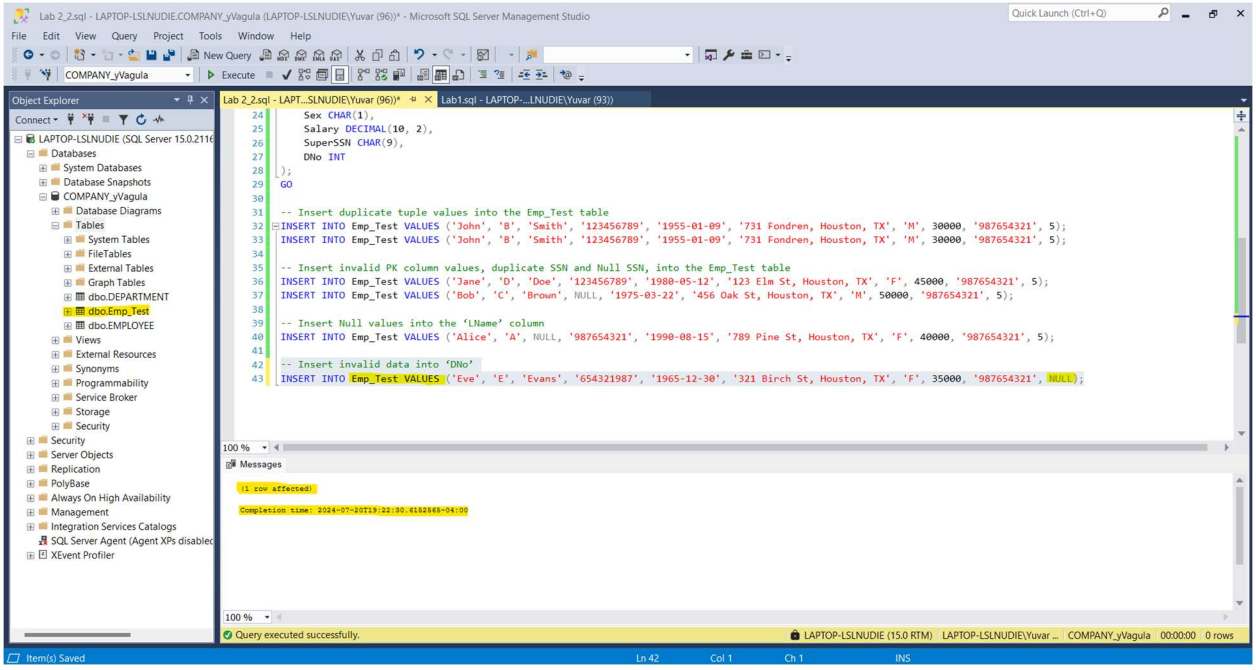
4. Insert **Null values** into the **'LName'** column

```
-- insert Null values into the 'LName' column
INSERT INTO Emp_Test VALUES ('Alice', 'A', NULL, '987654321', '1990-08-15', '789

Pine St, Houston, TX', 'F', 40000, '987654321', 5);
```

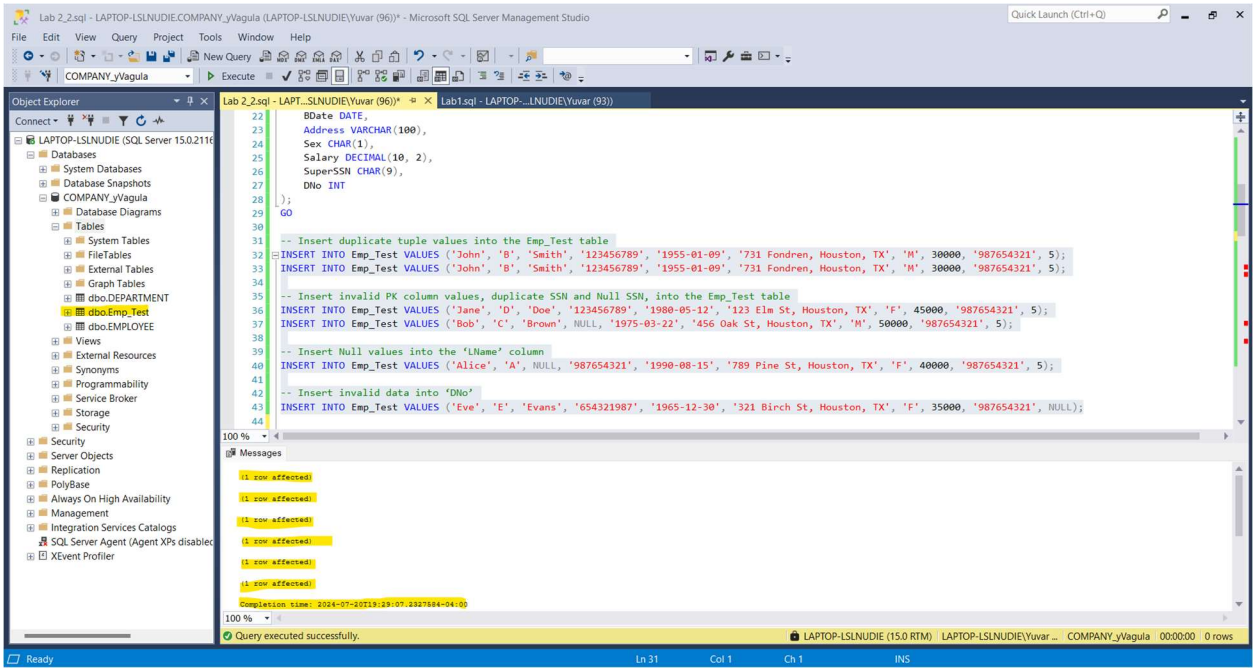


5. Insert invalid data into ‘DNo’

```
-- Insert invalid data into ‘DNo’
INSERT INTO Emp_Test VALUES ('Eve', 'E', 'Evans', '654321987', '1965-12-30', '321 Birch

St, Houston, TX', 'F', 35000, '987654321', NULL);
```

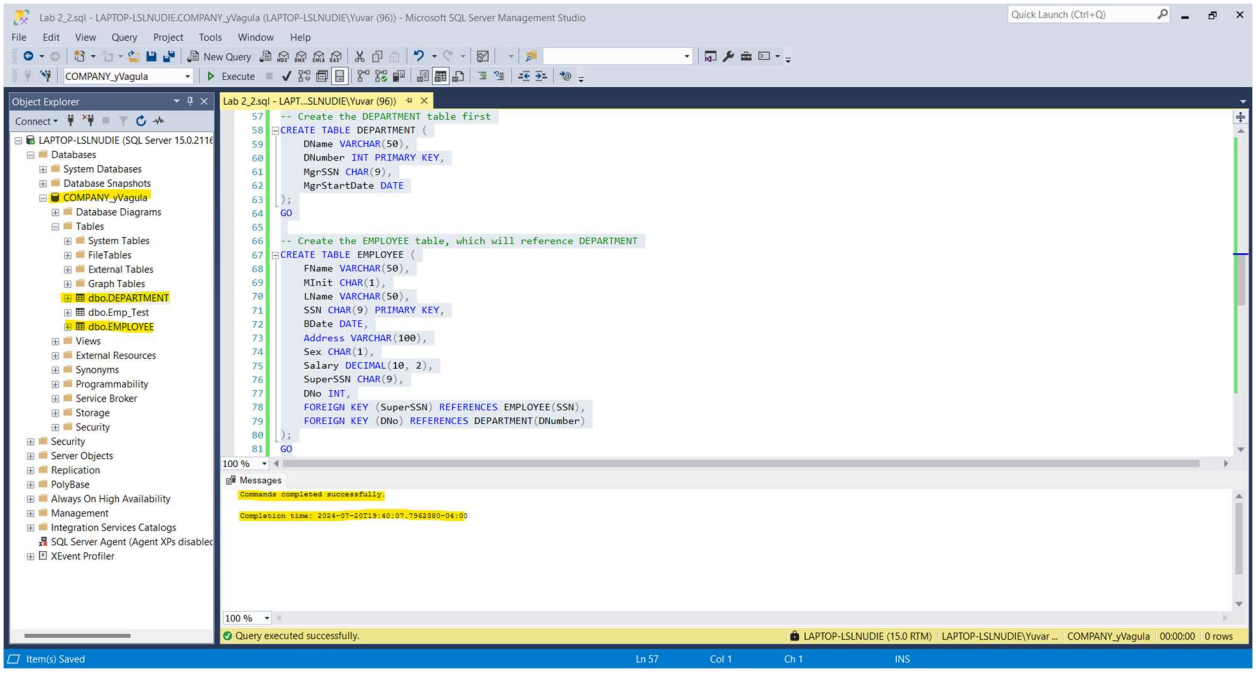


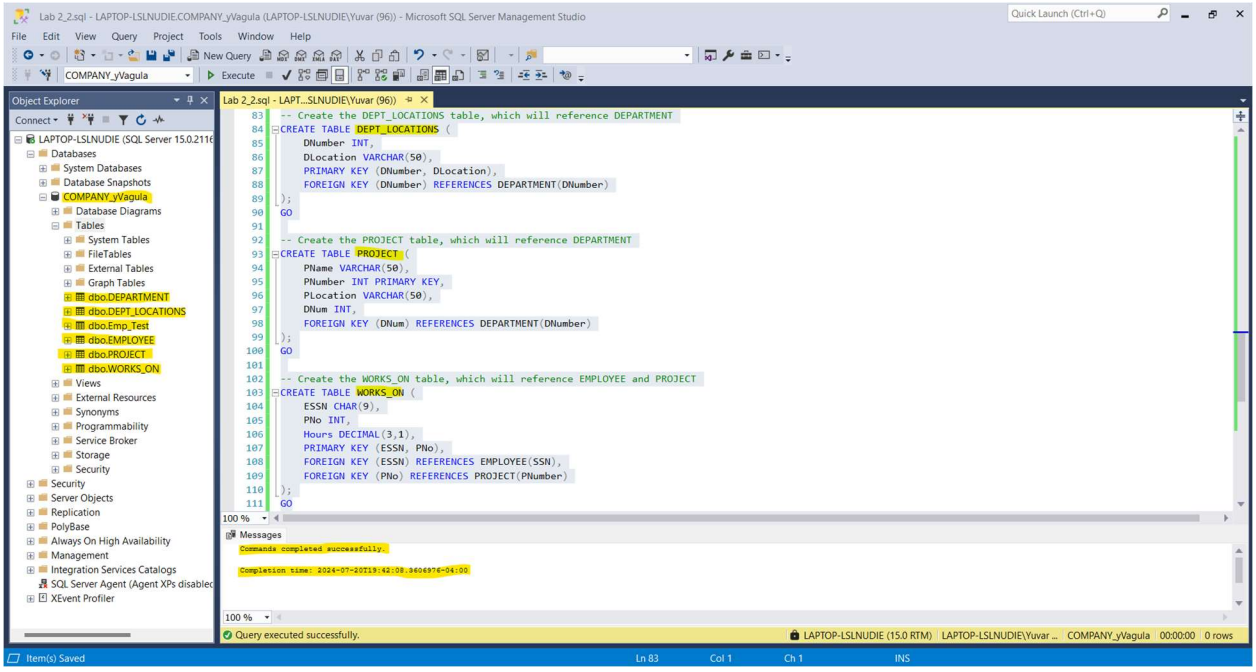
FINAL PART 1:

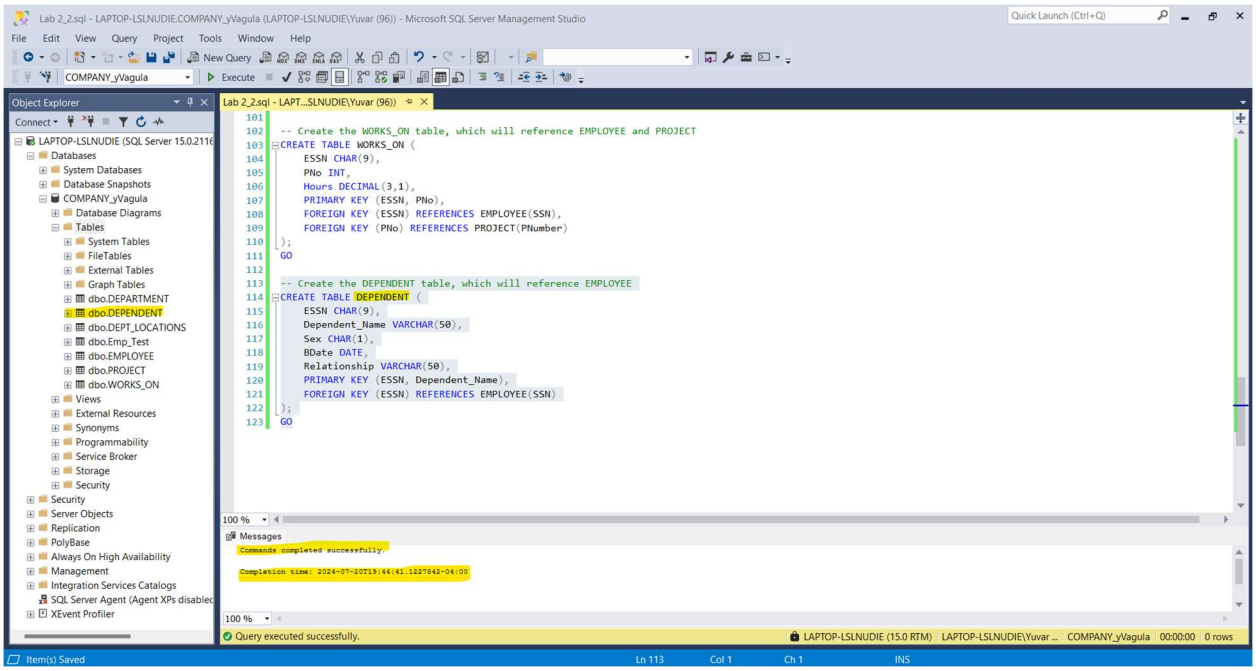


PART 2:

1. Create the database schema for the data





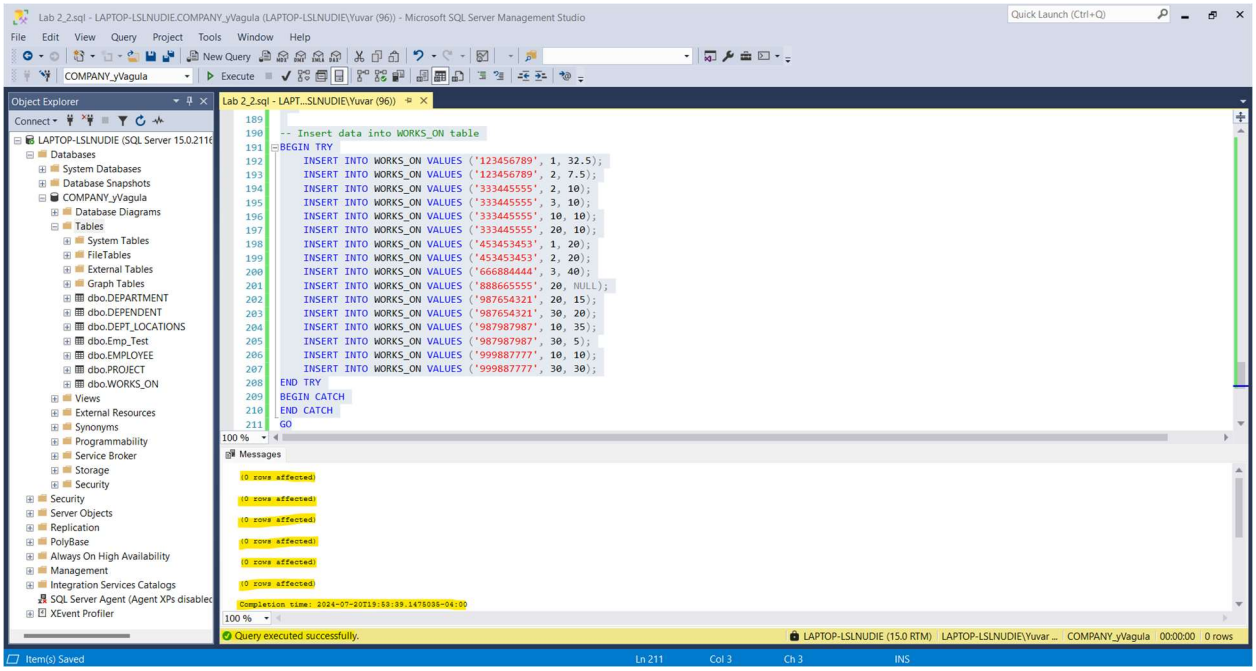

Lab 2_2.sql - LAPTOP-LSLNUDIE.COMPANY_yVagula (LAPTOP-LSLNUDIE\Yuvar (96)) - Microsoft SQL Server Management Studio
File Edit View Query Project Tools Window Help
New Query
Execute
COMPANY_yVagula
Object Explorer
Connect
LAPTOP-LSLNUDIE (SQL Server 15.0.2116
Databases
System Databases
Database Snapshots
COMPANY_yVagula
Database Diagrams
Tables
System Tables
FileTables
External Tables
Graph Tables
dbo.DEPARTMENT
dbo.DEPENDENT
dbo.DEPT_LOCATIONS
dbo.Emp_Test
dbo.EMPLOYEE
dbo.PROJECT
dbo.WORKS_ON
Views
External Resources
Synonyms
Programmability
Service Broker
Storage
Security
Security
Server Objects
Replication
PolyBase
Always On High Availability
Management
Integration Services Catalogs
SQL Server Agent (Agent XPs disabled
XEvent Profiler
Lab 2_2.sql - LAPT...SLNUDIE\Yuvar (96))
101
102 -- Create the WORKS_ON table, which will reference EMPLOYEE and PROJECT
103 CREATE TABLE WORKS_ON (
104 ESSN CHAR(9),
105 PNo INT,
106 Hours DECIMAL(3,1),
107 PRIMARY KEY (ESSN, PNo),
108 FOREIGN KEY (ESSN) REFERENCES EMPLOYEE(SSN),
109 FOREIGN KEY (PNo) REFERENCES PROJECT(PNumber)
110);
111 GO
112
113 -- Create the DEPENDENT table, which will reference EMPLOYEE
114 CREATE TABLE DEPENDENT (
115 ESSN CHAR(9),
116 Dependent_Name VARCHAR(50),
117 Sex CHAR(1),
118 BDate DATE,
119 Relationship VARCHAR(50),
120 PRIMARY KEY (ESSN, Dependent_Name),
121 FOREIGN KEY (ESSN) REFERENCES EMPLOYEE(SSN)
122);
123 GO
100 %
Messages
Commands completed successfully.
Completion time: 2024-07-20T19:44:41.1227842-04:00
100 %
Query executed successfully.
LAPTOP-LSLNUDIE (15.0 RTM)
LAPTOP-LSLNUDIE\Yuvar ...
COMPANY_yVagula
00:00:00
0 rows
Item(s) Saved
Ln 113
Col 1
Ch 1
INS

2. Insert the data into the database

```
       -- Insert data into DEPARTMENT table
BEGIN TRY
    INSERT INTO DEPARTMENT VALUES ('Headquarters', 1, '888665555', '1971-06-19');
    INSERT INTO DEPARTMENT VALUES ('Administration', 4, '987654321', '1985-01-01');
    INSERT INTO DEPARTMENT VALUES ('Research', 5, '333445555', '1978-05-22');
    INSERT INTO DEPARTMENT VALUES ('Automation', 7, '123456789', '2005-10-06');
END TRY
BEGIN CATCH
END CATCH
GO

-- Insert data into EMPLOYEE table
BEGIN TRY
    INSERT INTO EMPLOYEE VALUES ('John', 'B', 'Smith', '123456789', '1955-01-09', '731
Fondren, Houston, TX', 'M', 30000, '987654321', 5);
    INSERT INTO EMPLOYEE VALUES ('Franklin', 'T', 'Wong', '333445555', '1945-12-08', '638
Voss, Houston, TX', 'M', 40000, '888665555', 5);
    INSERT INTO EMPLOYEE VALUES ('Joyce', 'A', 'English', '453453453', '1962-07-31',
'5631 Rice, Houston, TX', 'F', 25000, '333445555', 5);
    INSERT INTO EMPLOYEE VALUES ('Ramesh', 'K', 'Narayan', '666884444', '1952-09-15',
'975 Fire Oak, Humble, TX', 'M', 38000, '333445555', 5);
    INSERT INTO EMPLOYEE VALUES ('James', 'E', 'Borg', '888665555', '1927-11-10', '450
Stone, Houston, TX', 'M', 55000, NULL, 1);
    INSERT INTO EMPLOYEE VALUES ('Jennifer', 'S', 'Wallace', '987654321', '1931-06-20',
'291 Berry, Bellaire, TX', 'F', 43000, '888665555', 4);
    INSERT INTO EMPLOYEE VALUES ('Ahmad', 'V', 'Jabbar', '987987987', '1959-03-29', '980
Dallas, Houston, TX', 'M', 25000, '987654321', 4);
    INSERT INTO EMPLOYEE VALUES ('Alicia', 'J', 'Zelaya', '999887777', '1958-07-19',
'3321 Castle, Spring, TX', 'F', 25000, '987654321', 4);
END TRY
BEGIN CATCH
END CATCH
GO

-- Insert data into DEPENDENT table
BEGIN TRY
    INSERT INTO DEPENDENT VALUES ('123456789', 'Alice', 'F', '1978-12-31', 'Daughter');
    INSERT INTO DEPENDENT VALUES ('123456789', 'Elizabeth', 'F', '1957-05-05', 'Spouse');
    INSERT INTO DEPENDENT VALUES ('123456789', 'Michael', 'M', '1978-01-01', 'Son');
    INSERT INTO DEPENDENT VALUES ('333445555', 'Alice', 'F', '1976-04-05', 'Daughter');
    INSERT INTO DEPENDENT VALUES ('333445555', 'Joy', 'F', '1948-05-03', 'Spouse');
    INSERT INTO DEPENDENT VALUES ('333445555', 'Theodore', 'M', '1973-10-25', 'Son');
    INSERT INTO DEPENDENT VALUES ('987654321', 'Abner', 'M', '1932-02-29', 'Spouse');
END TRY
BEGIN CATCH
END CATCH
GO

-- Insert data into DEPT_LOCATIONS table
BEGIN TRY
    INSERT INTO DEPT_LOCATIONS VALUES (1, 'Houston');
    INSERT INTO DEPT_LOCATIONS VALUES (4, 'Stafford');
    INSERT INTO DEPT_LOCATIONS VALUES (5, 'Bellaire');
    INSERT INTO DEPT_LOCATIONS VALUES (5, 'Sugarland');
    INSERT INTO DEPT_LOCATIONS VALUES (5, 'Houston');
```

```
END TRY
BEGIN CATCH
END CATCH
GO

-- Insert data into PROJECT table
BEGIN TRY
    INSERT INTO PROJECT VALUES ('ProductX', 1, 'Bellaire', 5);
    INSERT INTO PROJECT VALUES ('ProductY', 2, 'Sugarland', 5);
    INSERT INTO PROJECT VALUES ('ProductZ', 3, 'Houston', 5);
    INSERT INTO PROJECT VALUES ('Computerization', 10, 'Stafford', 4);
    INSERT INTO PROJECT VALUES ('Reorganization', 20, 'Houston', 1);
    INSERT INTO PROJECT VALUES ('Newbenefits', 30, 'Stafford', 4);
END TRY
BEGIN CATCH
END CATCH
GO

-- Insert data into WORKS_ON table
BEGIN TRY
    INSERT INTO WORKS_ON VALUES ('123456789', 1, 32.5);
    INSERT INTO WORKS_ON VALUES ('123456789', 2, 7.5);
    INSERT INTO WORKS_ON VALUES ('333445555', 2, 10);
    INSERT INTO WORKS_ON VALUES ('333445555', 3, 10);
    INSERT INTO WORKS_ON VALUES ('333445555', 10, 10);
    INSERT INTO WORKS_ON VALUES ('333445555', 20, 10);
    INSERT INTO WORKS_ON VALUES ('453453453', 1, 20);
    INSERT INTO WORKS_ON VALUES ('453453453', 2, 20);
    INSERT INTO WORKS_ON VALUES ('666884444', 3, 40);
    INSERT INTO WORKS_ON VALUES ('888665555', 20, NULL);
    INSERT INTO WORKS_ON VALUES ('987654321', 20, 15);
    INSERT INTO WORKS_ON VALUES ('987654321', 30, 20);
    INSERT INTO WORKS_ON VALUES ('987987987', 10, 35);
    INSERT INTO WORKS_ON VALUES ('987987987', 30, 5);
    INSERT INTO WORKS_ON VALUES ('999887777', 10, 10);
    INSERT INTO WORKS_ON VALUES ('999887777', 30, 30);
END TRY
BEGIN CATCH
END CATCH
```

GO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Database Snapshots
COMPANY_yVagula
Database Diagrams
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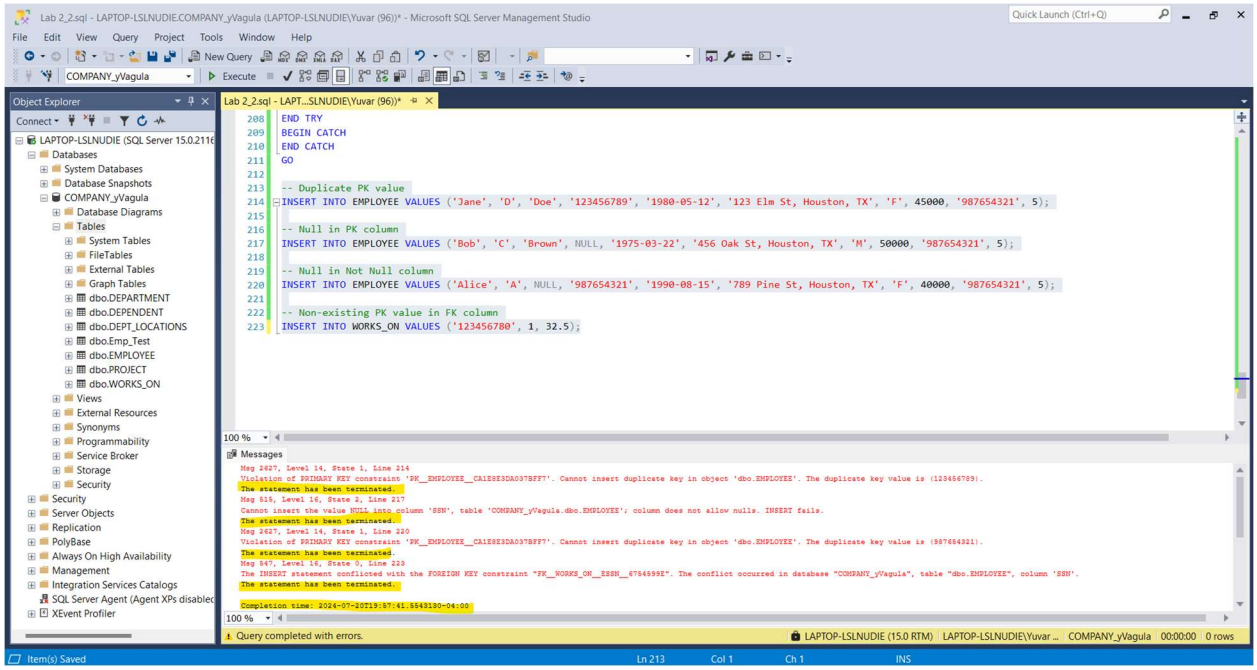
FileTables
External Tables
Graph Tables
dbo.DEPARTMENT
dbo.DEPENDENT
dbo.DEPT_LOCATIONS
dbo.Emp_Test
dbo.EMPLOYEE
dbo.PROJECT
dbo.WORKS_ON
Views
External Resources
Synonyms
Programmability
Service Broker
Storage
Security
Security
Server Objects
Replication
PolyBase
Always On High Availability
Management
Integration Services Catalogs
SQL Server Agent (Agent XPs disablec
XEvent Profiler
Lab 2_2.sql - LAPT...SLNUDIE\Yuvar (96))
189
190 -- Insert data into WORKS_ON table
191 BEGIN TRY
192 INSERT INTO WORKS_ON VALUES ('123456789', 1, 32.5);
193 INSERT INTO WORKS_ON VALUES ('123456789', 2, 7.5);
194 INSERT INTO WORKS_ON VALUES ('333445555', 2, 10);
195 INSERT INTO WORKS_ON VALUES ('333445555', 3, 10);
196 INSERT INTO WORKS_ON VALUES ('333445555', 10, 10);
197 INSERT INTO WORKS_ON VALUES ('333445555', 20, 10);
198 INSERT INTO WORKS_ON VALUES ('453453453', 1, 20);
199 INSERT INTO WORKS_ON VALUES ('453453453', 2, 20);
200 INSERT INTO WORKS_ON VALUES ('666884444', 3, 40);
201 INSERT INTO WORKS_ON VALUES ('888665555', 20, NULL);
202 INSERT INTO WORKS_ON VALUES ('987654321', 20, 15);
203 INSERT INTO WORKS_ON VALUES ('987654321', 30, 20);
204 INSERT INTO WORKS_ON VALUES ('987987987', 10, 35);
205 INSERT INTO WORKS_ON VALUES ('987987987', 30, 5);
206 INSERT INTO WORKS_ON VALUES ('999887777', 10, 10);
207 INSERT INTO WORKS_ON VALUES ('999887777', 30, 30);
208 END TRY
209 BEGIN CATCH
210 END CATCH
211 GO
100 %
Messages
(0 rows affected)
(0 rows affected)
(0 rows affected)
(0 rows affected)
(0 rows affected)
(0 rows affected)
Completion time: 2024-07-20T19:53:39.1475035-04:00
100 %
Query executed successfully.
LAPTOP-LSLNUDIE (15.0 RTM)
LAPTOP-LSLNUDIE\Yuvar ...
COMPANY_yVagula
00:00:00
0 rows
Item(s) Saved
Ln 211
Col 3
Ch 3
INS

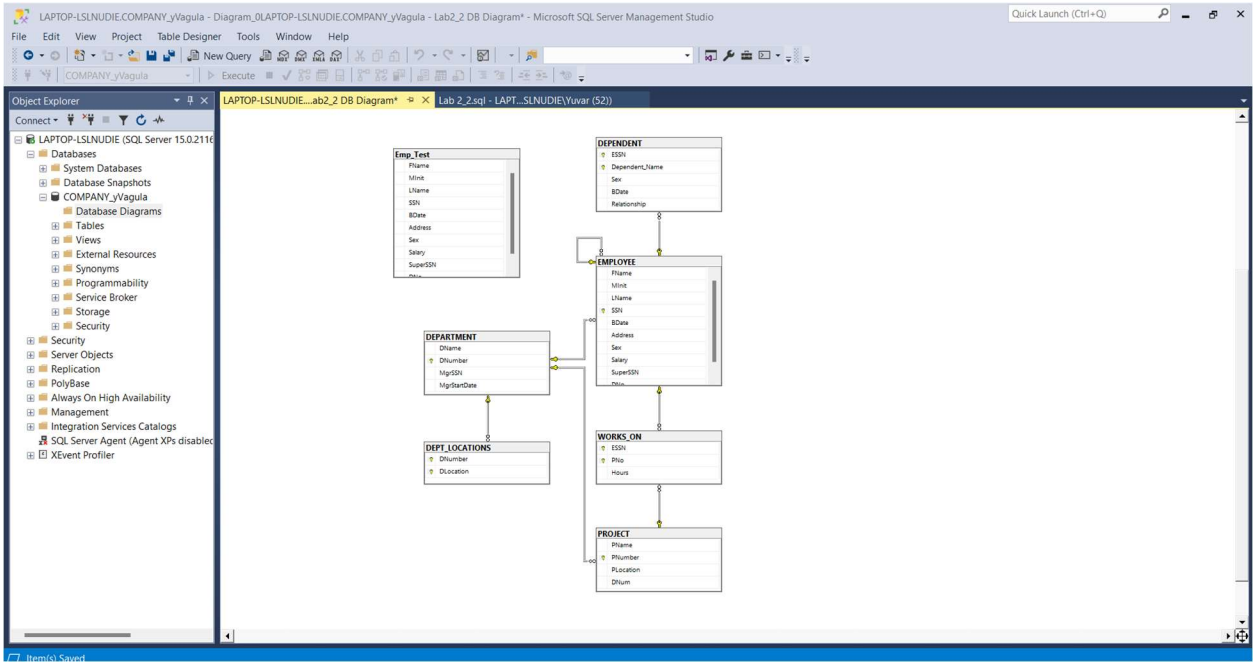
3. Now test the constraints with the same invalid data from part 1

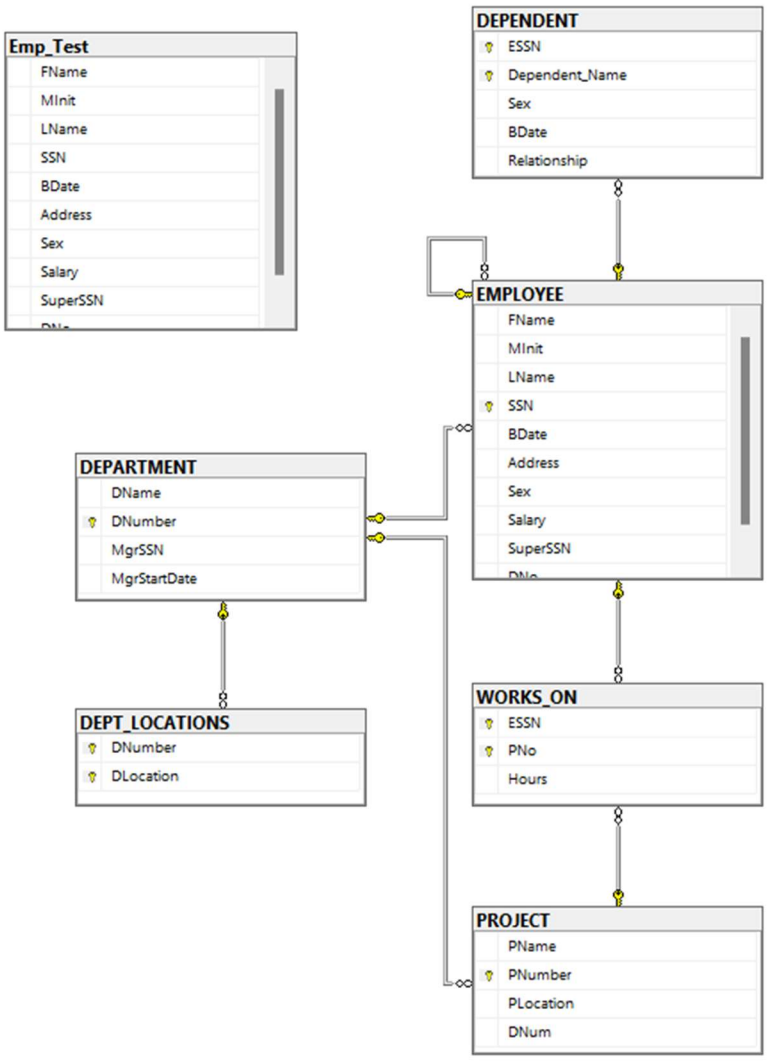
```
-- Duplicate PK value
INSERT INTO EMPLOYEE VALUES ('Jane', 'D', 'Doe', '123456789', '1980-05-12', '123 Elm St,
Houston, TX', 'F', 45000, '987654321', 5);

-- Null in PK column
INSERT INTO EMPLOYEE VALUES ('Bob', 'C', 'Brown', NULL, '1975-03-22', '456 Oak St,
Houston, TX', 'M', 50000, '987654321', 5);

-- Null in Not Null column
INSERT INTO EMPLOYEE VALUES ('Alice', 'A', NULL, '987654321', '1990-08-15', '789 Pine St,
Houston, TX', 'F', 40000, '987654321', 5);

-- Non-existing PK value in FK column
      INSERT INTO WORKS_ON VALUES ('123456780', 1, 32.5);
```



We should be getting errors to make sure that the data is safe and secured. There should be no incorrect values being entered into the tables.

Database Diagram:




Emp_Test
FName
MInit
LName
SSN
BDate
Address
Sex
Salary
SuperSSN
DEPENDENT
ESSN
Dependent_Name
Sex
BDate
Relationship
EMPLOYEE
FName
MInit
LName
SSN
BDate
Address
Sex
Salary
SuperSSN
DEPARTMENT
DName
DNumber
MgrSSN
MgrStartDate
DEPT_LOCATIONS
DNumber
DLocation
WORKS_ON
ESSN
PNo
Hours
PROJECT
PName
PNumber
PLocation
DNum

PROOF OF PATH AND FILENAME