CIS 430

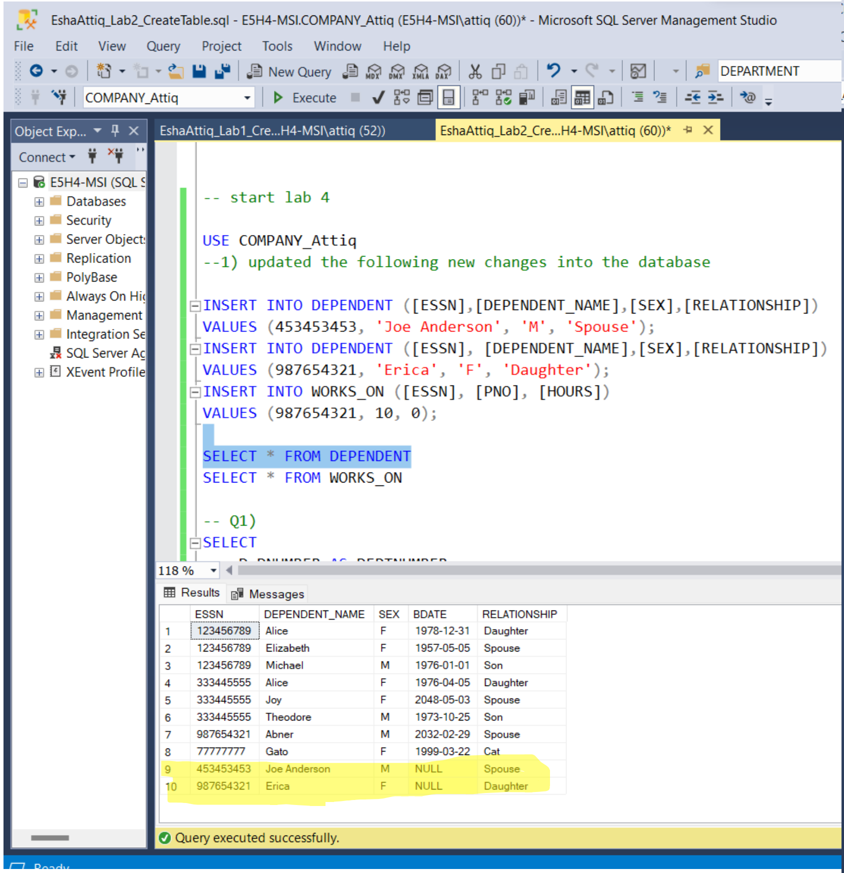
Esha Attiq

Lab Assignment 4

Objective: Querying a Relational Database COMPANY database

1) Updated new changes into DB (for DEPENDENT and WORKS_ON)

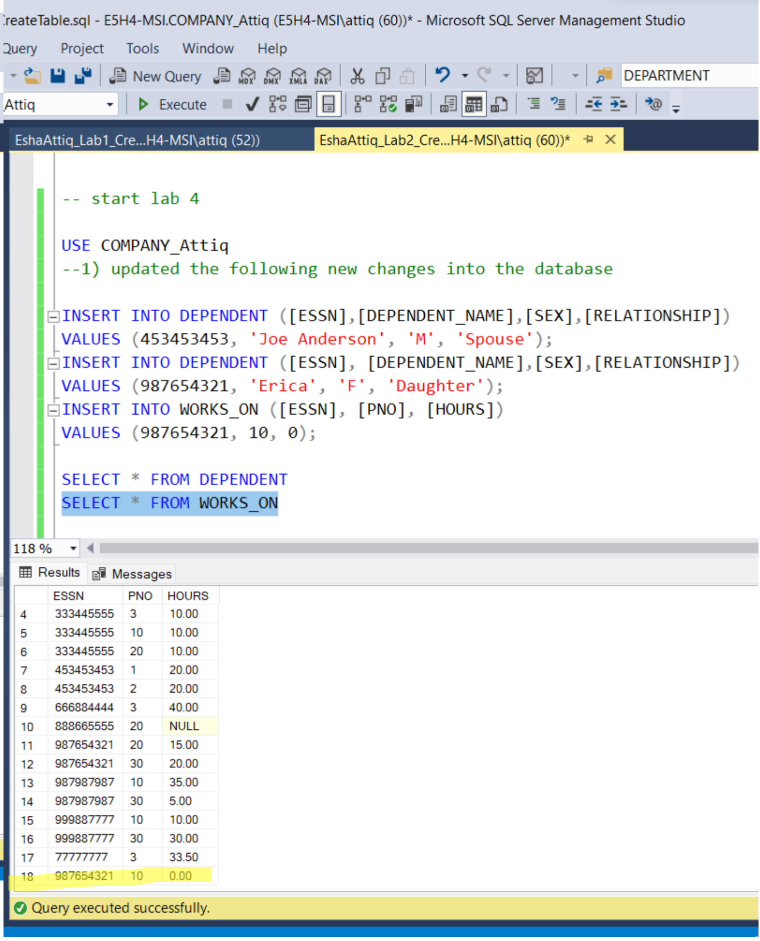
```
INSERT INTO DEPENDENT ([ESSN],[DEPENDENT_NAME],[SEX],[RELATIONSHIP])
VALUES (453453453, 'Joe Anderson', 'M', 'Spouse');
INSERT INTO DEPENDENT ([ESSN], [DEPENDENT_NAME],[SEX],[RELATIONSHIP])
VALUES (987654321, 'Erica', 'F', 'Daughter');
INSERT INTO WORKS_ON ([ESSN], [PNO], [HOURS])
VALUES (987654321, 10, 0);

SELECT * FROM DEPENDENT
SELECT * FROM WORKS_ON
```



```
-- start lab 4

USE COMPANY_Attiq
--1) updated the following new changes into the database

INSERT INTO DEPENDENT ([ESSN],[DEPENDENT_NAME],[SEX],[RELATIONSHIP])
VALUES (453453453, 'Joe Anderson', 'M', 'Spouse');
INSERT INTO DEPENDENT ([ESSN], [DEPENDENT_NAME],[SEX],[RELATIONSHIP])
VALUES (987654321, 'Erica', 'F', 'Daughter');
INSERT INTO WORKS_ON ([ESSN], [PNO], [HOURS])
VALUES (987654321, 10, 0);

SELECT * FROM DEPENDENT
SELECT * FROM WORKS_ON

-- Q1)
SELECT
```

	ESSN	DEPENDENT_NAME	SEX	BDATE	RELATIONSHIP
1	123456789	Alice	F	1978-12-31	Daughter
2	123456789	Elizabeth	F	1957-05-05	Spouse
3	123456789	Michael	M	1976-01-01	Son
4	333445555	Alice	F	1976-04-05	Daughter
5	333445555	Joy	F	2048-05-03	Spouse
6	333445555	Theodore	M	1973-10-25	Son
7	987654321	Abner	M	2032-02-29	Spouse
8	77777777	Gato	F	1999-03-22	Cat
9	453453453	Joe Anderson	M	NULL	Spouse
10	987654321	Erica	F	NULL	Daughter

Query executed successfully.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118 %
Results
Messages

```
-- start lab 4

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INSERT INTO DEPENDENT ([ESSN],[DEPENDENT_NAME],[SEX],[RELATIONSHIP])
VALUES (453453453, 'Joe Anderson', 'M', 'Spouse');
INSERT INTO DEPENDENT ([ESSN], [DEPENDENT_NAME],[SEX],[RELATIONSHIP])
VALUES (987654321, 'Erica', 'F', 'Daughter');
INSERT INTO WORKS_ON ([ESSN], [PNO], [HOURS])
VALUES (987654321, 10, 0);

SELECT * FROM DEPENDENT
SELECT * FROM WORKS_ON
```
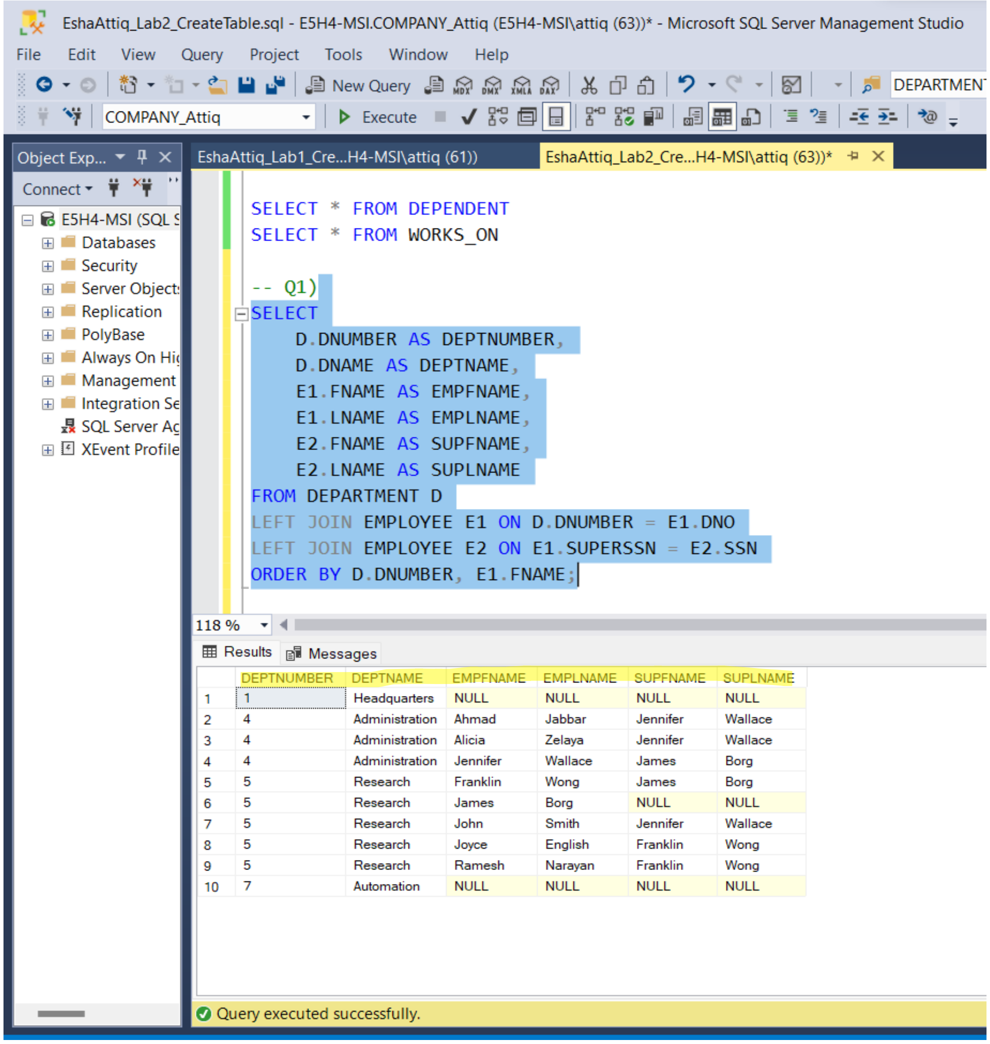

	ESSN	PNO	HOURS
4	333445555	3	10.00
5	333445555	10	10.00
6	333445555	20	10.00
7	453453453	1	20.00
8	453453453	2	20.00
9	666884444	3	40.00
10	888665555	20	NULL
11	987654321	20	15.00
12	987654321	30	20.00
13	987987987	10	35.00
14	987987987	30	5.00
15	999887777	10	10.00
16	999887777	30	30.00
17	77777777	3	33.50
18	987654321	10	0.00

Query executed successfully.

Q1. List the first and last name of each employee who is working in the department with the first and last name of his or her immediate supervisor with the department number and name together. Include all the departments including the departments that do not have any employee and all the employees including the ones who do not have any supervisors. List the result in the order of each department number and the first name of each employee.

```sql
-- Q1)
SELECT
    D.DNUMBER AS DEPTNUMBER,
    D.DNAME AS DEPTNAME,
    E1.FNAME AS EMPFNAME,
    E1.LNAME AS EMPLNAME,
    E2.FNAME AS SUPFNAME,
    E2.LNAME AS SUPLNAME
FROM DEPARTMENT D
LEFT JOIN EMPLOYEE E1 ON D.DNUMBER = E1.DNO
LEFT JOIN EMPLOYEE E2 ON E1.SUPERSSN = E2.SSN
ORDER BY D.DNUMBER, E1.FNAME;
```



EshaAttiq_Lab2_CreateTable.sql - E5H4-MSI.COMPANY_Attiq (E5H4-MSI\attiq (63))* - Microsoft SQL Server Management Studio

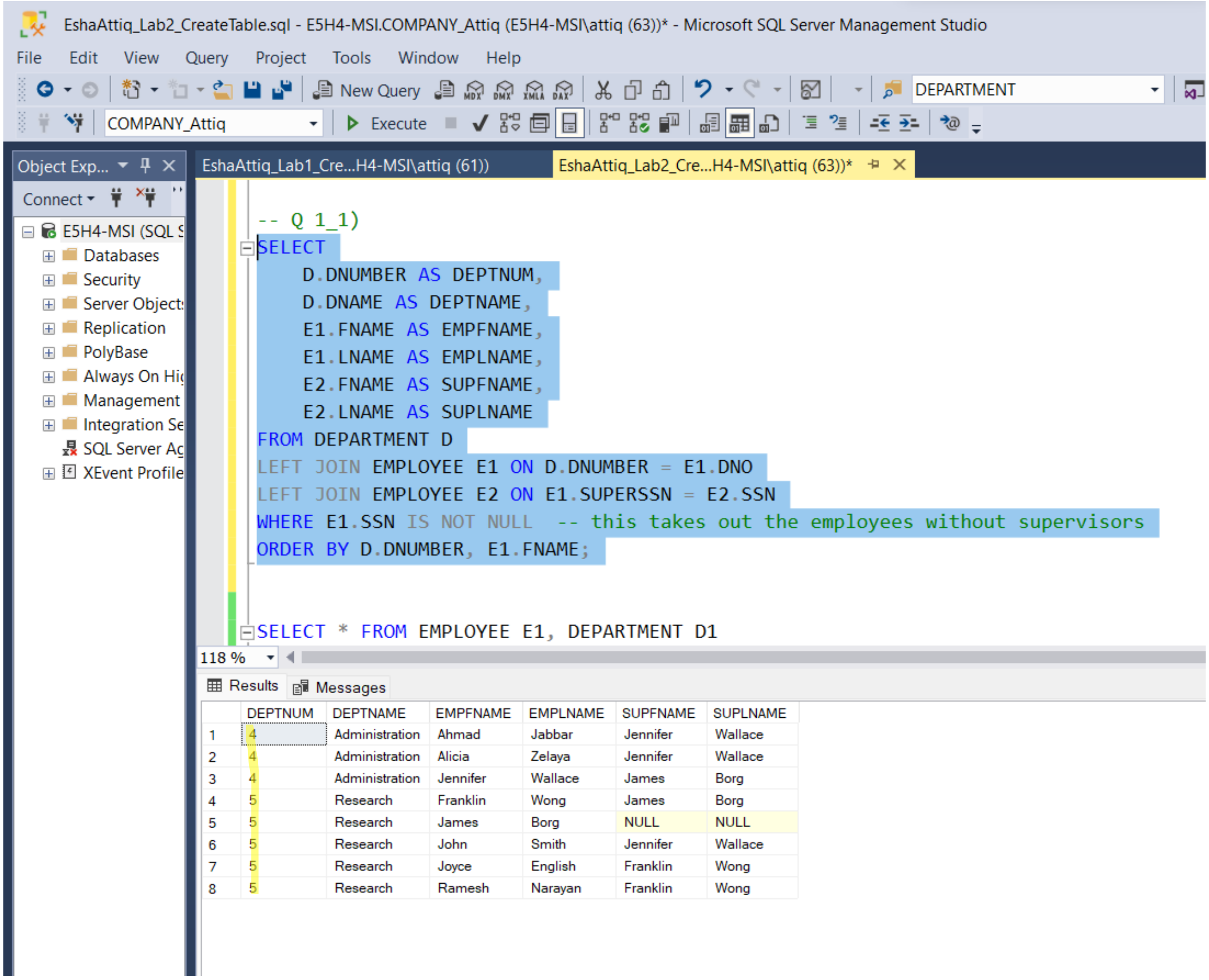
```sql
SELECT * FROM DEPENDENT
SELECT * FROM WORKS_ON

-- Q1)
SELECT
    D.DNUMBER AS DEPTNUMBER,
    D.DNAME AS DEPTNAME,
    E1.FNAME AS EMPFNAME,
    E1.LNAME AS EMPLNAME,
    E2.FNAME AS SUPFNAME,
    E2.LNAME AS SUPLNAME
FROM DEPARTMENT D
LEFT JOIN EMPLOYEE E1 ON D.DNUMBER = E1.DNO
LEFT JOIN EMPLOYEE E2 ON E1.SUPERSSN = E2.SSN
ORDER BY D.DNUMBER, E1.FNAME;
```

	DEPTNUMBER	DEPTNAME	EMPFNAME	EMPLNAME	SUPFNAME	SUPLNAME
1	1	Headquarters	NULL	NULL	NULL	NULL
2	4	Administration	Ahmad	Jabbar	Jennifer	Wallace
3	4	Administration	Alicia	Zelaya	Jennifer	Wallace
4	4	Administration	Jennifer	Wallace	James	Borg
5	5	Research	Franklin	Wong	James	Borg
6	5	Research	James	Borg	NULL	NULL
7	5	Research	John	Smith	Jennifer	Wallace
8	5	Research	Joyce	English	Franklin	Wong
9	5	Research	Ramesh	Narayan	Franklin	Wong
10	7	Automation	NULL	NULL	NULL	NULL

Query executed successfully.

Q1_1) List the same information as Q1 with a change: List all the employees including the ones who do not have any supervisor, but do not include the departments that do not have any employee in the output. So, your result of Q1_1 will list the department 1, 4, 5 and all the related employees with his/her supervisors including the ones who do not have supervisors. So it will be the same as Q1 except the department 7 won't be included.

```
-- Q 1_1)
SELECT
    D.DNUMBER AS DEPTNUM,
    D.DNAME AS DEPTNAME,
    E1.FNAME AS EMPFNAME,
    E1.LNAME AS EMPLNAME,
    E2.FNAME AS SUPFNAME,
    E2.LNAME AS SUPLNAME
FROM DEPARTMENT D
LEFT JOIN EMPLOYEE E1 ON D.DNUMBER = E1.DNO
LEFT JOIN EMPLOYEE E2 ON E1.SUPERSSN = E2.SSN
WHERE E1.SSN IS NOT NULL  -- this takes out the employees without supervisors
ORDER BY D.DNUMBER, E1.FNAME;
```



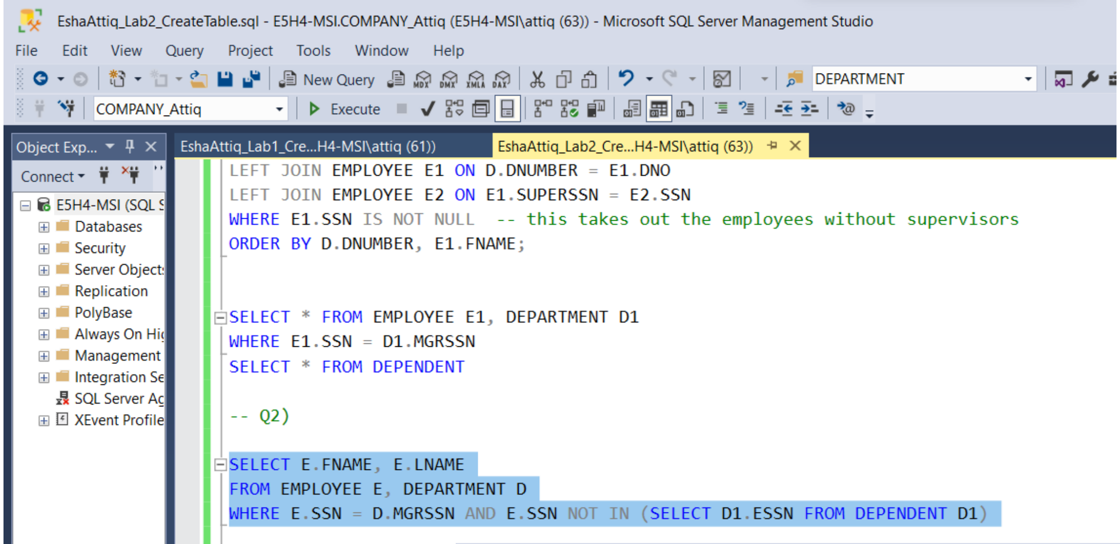
```
-- Q 1_1)
SELECT
    D.DNUMBER AS DEPTNUM,
    D.DNAME AS DEPTNAME,
    E1.FNAME AS EMPFNAME,
    E1.LNAME AS EMPLNAME,
    E2.FNAME AS SUPFNAME,
    E2.LNAME AS SUPLNAME
FROM DEPARTMENT D
LEFT JOIN EMPLOYEE E1 ON D.DNUMBER = E1.DNO
LEFT JOIN EMPLOYEE E2 ON E1.SUPERSSN = E2.SSN
WHERE E1.SSN IS NOT NULL  -- this takes out the employees without supervisors
ORDER BY D.DNUMBER, E1.FNAME;
```

```
SELECT * FROM EMPLOYEE E1, DEPARTMENT D1
```

	DEPTNUM	DEPTNAME	EMPFNAME	EMPLNAME	SUPFNAME	SUPLNAME
1	4	Administration	Ahmad	Jabbar	Jennifer	Wallace
2	4	Administration	Alicia	Zelaya	Jennifer	Wallace
3	4	Administration	Jennifer	Wallace	James	Borg
4	5	Research	Franklin	Wong	James	Borg
5	5	Research	James	Borg	NULL	NULL
6	5	Research	John	Smith	Jennifer	Wallace
7	5	Research	Joyce	English	Franklin	Wong
8	5	Research	Ramesh	Narayan	Franklin	Wong

Q2) Managers with no dependents

```
-- Q2)
SELECT E.FNAME, E.LNAME
FROM EMPLOYEE E, DEPARTMENT D
WHERE E.SSN = D.MGRSSN AND E.SSN NOT IN (SELECT D1.ESSN FROM DEPENDENT D1)
```

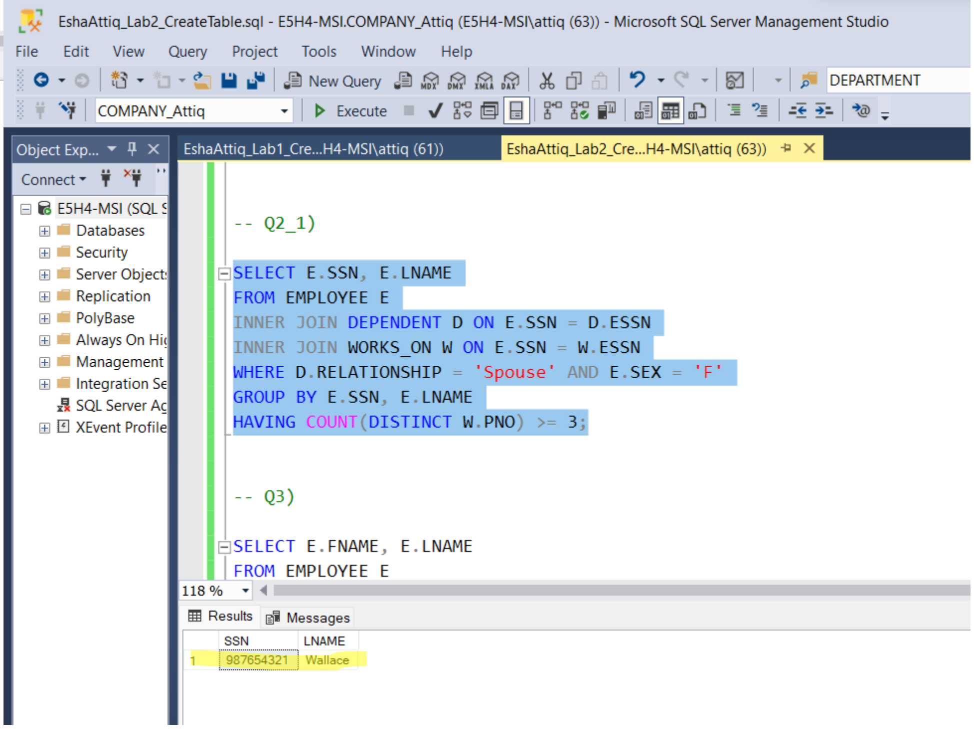


```
LEFT JOIN EMPLOYEE E1 ON D.DNUMBER = E1.DNO
LEFT JOIN EMPLOYEE E2 ON E1.SUPERSSN = E2.SSN
WHERE E1.SSN IS NOT NULL  -- this takes out the employees without supervisors
ORDER BY D.DNUMBER, E1.FNAME;


SELECT * FROM EMPLOYEE E1, DEPARTMENT D1
WHERE E1.SSN = D1.MGRSSN
SELECT * FROM DEPENDENT

-- Q2)

SELECT E.FNAME, E.LNAME
FROM EMPLOYEE E, DEPARTMENT D
WHERE E.SSN = D.MGRSSN AND E.SSN NOT IN (SELECT D1.ESSN FROM DEPENDENT D1)
```

	FNAME	LNAME
1	James	Borg

Q2_1) Get SSN and the last name of married female employees who work on three or more projects. (right screenshot →)

```
-- Q2_1)

SELECT E.SSN, E.LNAME
FROM EMPLOYEE E
INNER JOIN DEPENDENT D ON
E.SSN = D.ESSN
INNER JOIN WORKS_ON W ON E.SSN
= W.ESSN
WHERE D.RELATIONSHIP =
'Spouse' AND E.SEX = 'F'
GROUP BY E.SSN, E.LNAME
HAVING COUNT(DISTINCT W.PNO) >= 3;
```

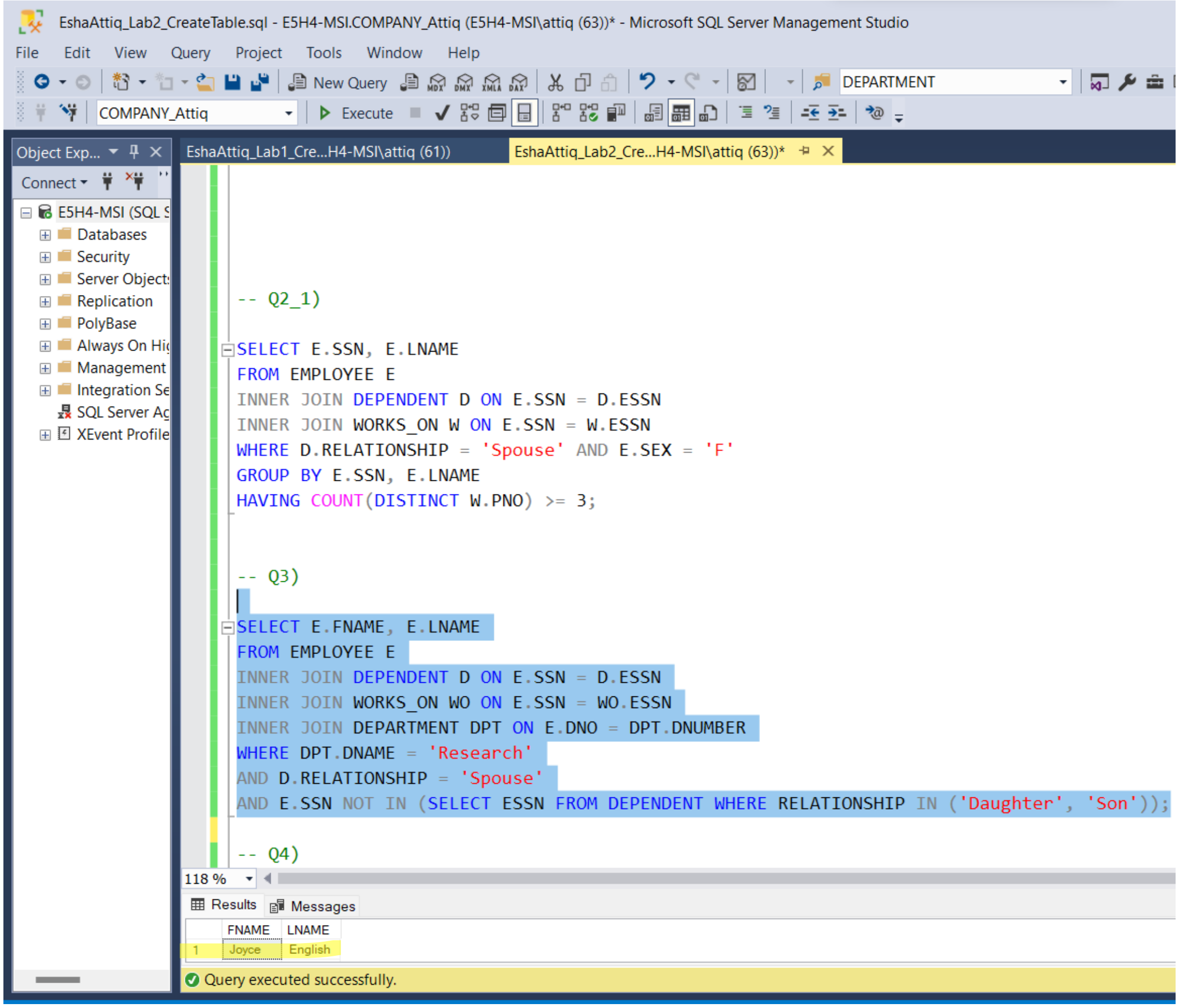


```
-- Q2_1)

SELECT E.SSN, E.LNAME
FROM EMPLOYEE E
INNER JOIN DEPENDENT D ON E.SSN = D.ESSN
INNER JOIN WORKS_ON W ON E.SSN = W.ESSN
WHERE D.RELATIONSHIP = 'Spouse' AND E.SEX = 'F'
GROUP BY E.SSN, E.LNAME
HAVING COUNT(DISTINCT W.PNO) >= 3;


-- Q3)

SELECT E.FNAME, E.LNAME
FROM EMPLOYEE E
```

	SSN	LNAME
1	987654321	Wallace

Q3) List the name of employees who is working for 'Research' department and are married but have no children.

```sql
-- Q3)
SELECT E.FNAME, E.LNAME
FROM EMPLOYEE E
INNER JOIN DEPENDENT D ON E.SSN = D.ESSN
INNER JOIN WORKS_ON WO ON E.SSN = WO.ESSN
INNER JOIN DEPARTMENT DPT ON E.DNO = DPT.DNUMBER
WHERE DPT.DNAME = 'Research'
AND D.RELATIONSHIP = 'Spouse'
AND E.SSN NOT IN (SELECT ESSN FROM DEPENDENT WHERE RELATIONSHIP IN ('Daughter', 'Son'));
```



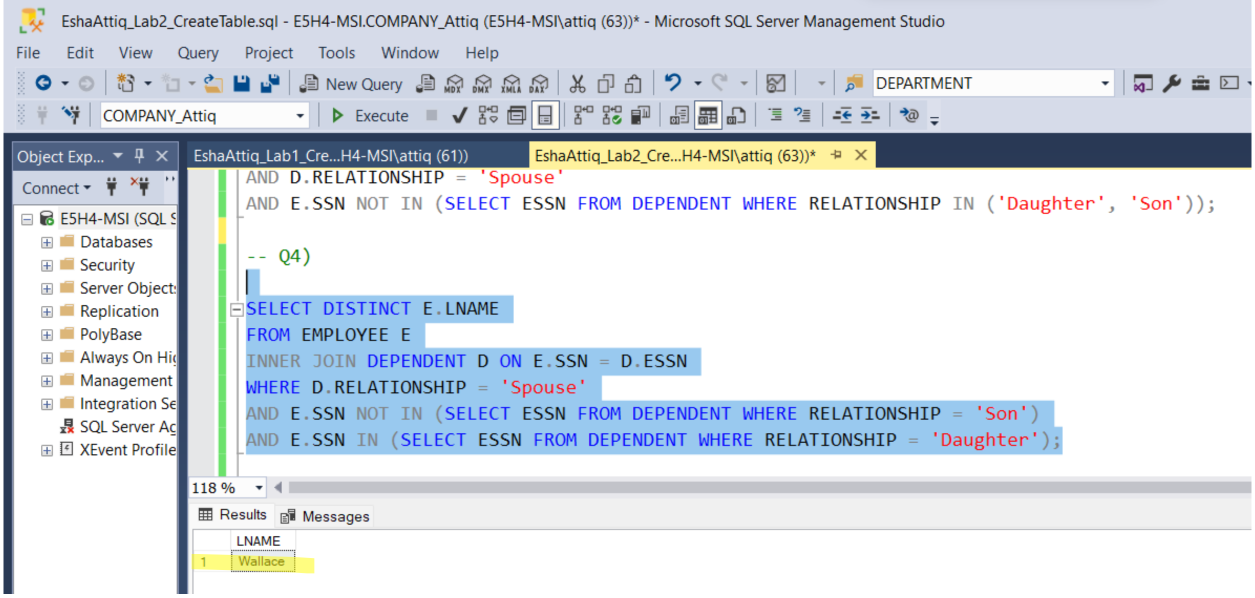
```sql
-- Q2_1)

SELECT E.SSN, E.LNAME
FROM EMPLOYEE E
INNER JOIN DEPENDENT D ON E.SSN = D.ESSN
INNER JOIN WORKS_ON W ON E.SSN = W.ESSN
WHERE D.RELATIONSHIP = 'Spouse' AND E.SEX = 'F'
GROUP BY E.SSN, E.LNAME
HAVING COUNT(DISTINCT W.PNO) >= 3;


-- Q3)

SELECT E.FNAME, E.LNAME
FROM EMPLOYEE E
INNER JOIN DEPENDENT D ON E.SSN = D.ESSN
INNER JOIN WORKS_ON WO ON E.SSN = WO.ESSN
INNER JOIN DEPARTMENT DPT ON E.DNO = DPT.DNUMBER
WHERE DPT.DNAME = 'Research'
AND D.RELATIONSHIP = 'Spouse'
AND E.SSN NOT IN (SELECT ESSN FROM DEPENDENT WHERE RELATIONSHIP IN ('Daughter', 'Son'));

-- Q4)
```

	FNAME	LNAME
1	Joyce	English

Query executed successfully.

Q4) Get the last name of married employees who only have daughters.

```
-- Q4)
SELECT DISTINCT E.LNAME
FROM EMPLOYEE E
INNER JOIN DEPENDENT D ON E.SSN = D.ESSN
WHERE D.RELATIONSHIP = 'Spouse'
AND E.SSN NOT IN (SELECT ESSN FROM DEPENDENT WHERE RELATIONSHIP = 'Son')
AND E.SSN IN (SELECT ESSN FROM DEPENDENT WHERE RELATIONSHIP = 'Daughter');
```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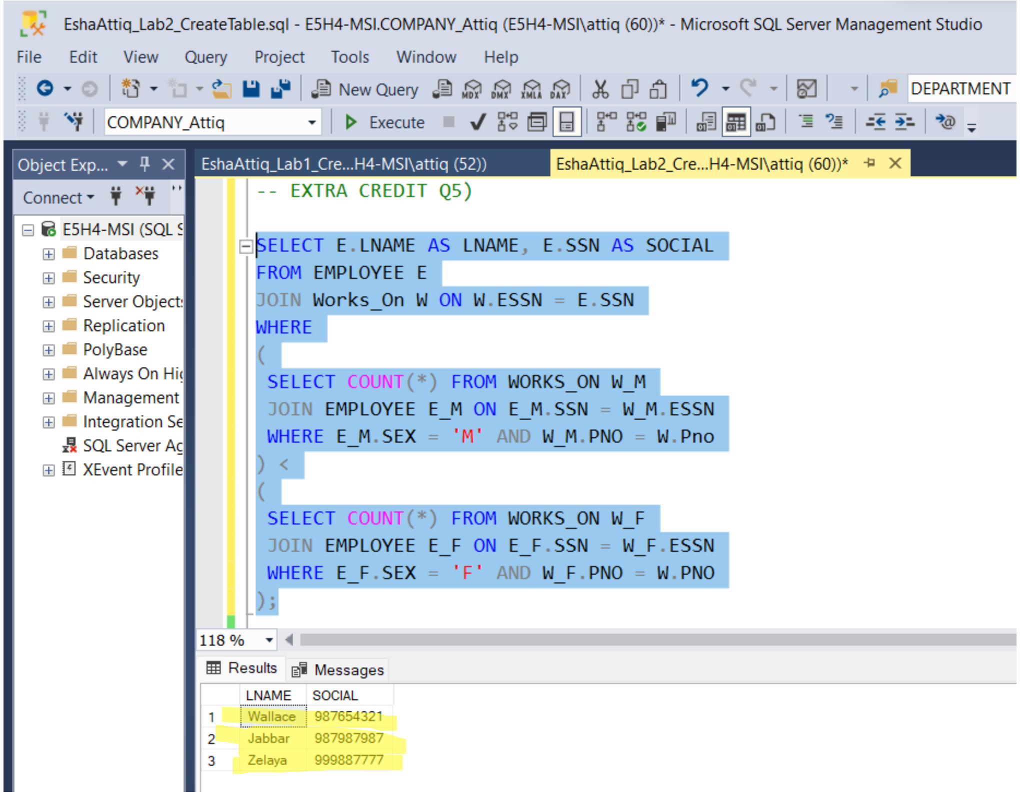
```
AND D.RELATIONSHIP = 'Spouse'
AND E.SSN NOT IN (SELECT ESSN FROM DEPENDENT WHERE RELATIONSHIP IN ('Daughter', 'Son'));

-- Q4)

SELECT DISTINCT E.LNAME
FROM EMPLOYEE E
INNER JOIN DEPENDENT D ON E.SSN = D.ESSN
WHERE D.RELATIONSHIP = 'Spouse'
AND E.SSN NOT IN (SELECT ESSN FROM DEPENDENT WHERE RELATIONSHIP = 'Son')
AND E.SSN IN (SELECT ESSN FROM DEPENDENT WHERE RELATIONSHIP = 'Daughter');
```

	LNAME
1	Wallace

Q5) EXTRA CREDIT !!

```
-- EXTRA CREDIT Q5)

SELECT E.LNAME AS LNAME,
E.SSN AS SOCIAL
FROM EMPLOYEE E
JOIN Works_On W ON W.ESSN =
E.SSN
WHERE
(
 SELECT COUNT(*) FROM
WORKS_ON W_M
 JOIN EMPLOYEE E_M ON
E_M.SSN = W_M.ESSN
 WHERE E_M.SEX = 'M' AND
W_M.PNO = W.Pno
) <
(
 SELECT COUNT(*) FROM
WORKS_ON W_F
 JOIN EMPLOYEE E_F ON
E_F.SSN = W_F.ESSN
 WHERE E_F.SEX = 'F' AND
W_F.PNO = W.PNO
);
```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EshaAttiq_Lab2_Cre...H4-MSI\attiq (60))*
118 %
Results
Messages

```
-- EXTRA CREDIT Q5)

SELECT E.LNAME AS LNAME, E.SSN AS SOCIAL
FROM EMPLOYEE E
JOIN Works_On W ON W.ESSN = E.SSN
WHERE
(
 SELECT COUNT(*) FROM WORKS_ON W_M
 JOIN EMPLOYEE E_M ON E_M.SSN = W_M.ESSN
 WHERE E_M.SEX = 'M' AND W_M.PNO = W.Pno
) <
(
 SELECT COUNT(*) FROM WORKS_ON W_F
 JOIN EMPLOYEE E_F ON E_F.SSN = W_F.ESSN
 WHERE E_F.SEX = 'F' AND W_F.PNO = W.PNO
);
```

	LNAME	SOCIAL
1	Wallace	987654321
2	Jabbar	987987987
3	Zelaya	999887777