Marmara University – Faculty of Engineering – Department of Computer Engineering

Fall 2021 – CSE3055 Database Systems
SQL Statements

Query 1: Retrieve ssn values of the employees.

Output:

17 rows

Ssn
101
111
112
132
202
221
222
303
330
331
404
440
441
505
550
551
555

Query 2: Retrieve ssn, first name and last name of the employees.

Output:

17 rows

Ssn	FirstName	LastName
101	Ali	Yılmaz
111	Mehmet	Semiz
112	Meryem	Beyza
132	Veli	Sezen
202	Veli	Şirin
221	Dilek	Mutlu
222	Tolga	Kaymaz
303	Zeynep	Demir
330	Melek	Ertan
331	Leyla	Metin
404	Emel	Temel
440	Can	Tan
441	Candan	Taner
505	Ahmet	Kartal
550	Sezgin	Şener
551	Merve	Caner
555	Fatma	Atak

Query 3: Retrieve ssn, first and last name, birthdate and address of the employee whose ssn is 101.

Output:

1 row

Ssn	FirstName	LastName	Birthdate	Address
101	Ali	Yılmaz	1977-01-11 00:00:00	Patika Sok 11 Kadıköy

Query 4: Retrieve the birthdate and address of the employee(s) whose name is "Ali Yılmaz".

Output:

1 row

Birthdate	Address
1977-01-11 00:00:00	Patika Sok 11 Kadıköy

Query 5: Retrieve ssn, full name (first & last concatenated) and salary of female employees whose salary is between 600 and 700. Rename "first & last concatenated" as FullName.

Output:

1 row

Ssn	FullName	Salary
441	Candan Taner	700
551	Merve Caner	700

Query 6: Retrieve ssn and department number of employees in departments 4 and 6.

Output:

3 rows

Ssn	Dno
404	6
440	4
441	4

Query 7: Retrieve department name and the ssn, first and last name of their managers.

Output:

5 rows

DName	Ssn	FirstName	LastName
Central Office	101	Ali	Yılmaz
R&D	202	Veli	Şirin
Sales	303	Zeynep	Demir
Marketing	404	Emel	Temel
Human Resources	505	Ahmet	Kartal

Query 8: Retrieve ssn, first name and department name of employees who work for the department "Marketing".

Output:

2 rows

Ssn	FirstName	DName
440	Can	Marketing
441	Candan	Marketing

Query 9: Retrieve ssn, first name, department number and department name of employees who work for the department "Marketing".

Output:

Error: Ambiguous column name 'DNo'.
Replace DNo with Employee.DNo or Department.DNo in Select clause.

Query 10: Rewrite the previous query using aliases.

Output:

2 rows

Ssn	FirstName	DNo	DName
440	Can	4	Marketing
441	Candan	4	Marketing

Query 11: Retrieve ssn, first name and department name of all employees.

Output:

16 rows

Ssn	FirstName	DName
101	Ali	Central Office
111	Mehmet	Central Office
112	Meryem	Central Office
132	Veli	Central Office

202	Veli	R&D
221	Dilek	R&D
222	Tolga	R&D
303	Zeynep	Sales
330	Melek	Sales
331	Leyla	Sales
440	Can	Marketing
441	Candan	Marketing
505	Ahmet	Human Resources
550	Sezgin	Human Resources
551	Merve	Human Resources
555	Fatma	Human Resources

Anything missing?

Query 12: Retrieve ssn, first name and department name of all employees even in the case that the employee does not belong to any department.

Output:

17 rows

Ssn	FirstName	DName
101	Ali	Central Office
111	Mehmet	Central Office
112	Meryem	Central Office
132	Veli	Central Office
202	Veli	R&D
221	Dilek	R&D
222	Tolga	R&D
303	Zeynep	Sales
330	Melek	Sales
331	Leyla	Sales
404	Emel	NULL
440	Can	Marketing
441	Candan	Marketing
505	Ahmet	Human Resources
550	Sezgin	Human Resources
551	Merve	Human Resources
555	Fatma	Human Resources

What about right outer join? Or, full outer join?

Query 13: For each employee, retrieve the employee's ssn, first and last name and the ssn, first and last name of his/her immediate supervisor. If he/she has not a supervisor, leave his/her supervisor's info blank.

Output:

17 rows

Ssn	FirstName	LastName	Ssn	FirstName	LastName
101	Ali	Yılmaz	NULL	NULL	NULL
111	Mehmet	Semiz	101	Ali	Yılmaz
112	Meryem	Beyza	101	Ali	Yılmaz
132	Veli	Sezen	101	Ali	Yılmaz
202	Veli	Şirin	101	Ali	Yılmaz
221	Dilek	Mutlu	202	Veli	Şirin
222	Tolga	Kaymaz	202	Veli	Şirin
303	Zeynep	Demir	101	Ali	Yılmaz
330	Melek	Ertan	303	Zeynep	Demir
331	Leyla	Metin	303	Zeynep	Demir
404	Emel	Temel	101	Ali	Yılmaz
440	Can	Tan	404	Emel	Temel
441	Candan	Taner	404	Emel	Temel
505	Ahmet	Kartal	101	Ali	Yılmaz
550	Sezgin	Şener	505	Ahmet	Kartal
551	Merve	Caner	505	Ahmet	Kartal
555	Fatma	Atak	505	Ahmet	Kartal

Query 14: Retrieve all fields and rows of table Employee.

Output:

17 rows

FirstName	LastName	Ssn	Birthdate	Address	Gender	Salary	SuperSsn	Dno		
Ali	Yılmaz	101	1977-01-11 00:00:00	Patika Sok 11 Kadıköy	M		900	NULL	1	
Mehmet	Semiz	111	1980-02-02 00:00:00	Taksim	M	550	101	1		
Meryem	Beyza	112	1989-04-04 00:00:00	Bahçelievler	F	500	101	1		
Veli	Sezen	132	1981-11-22 00:00:00	Kadıköy	M	800	101	1		
Veli	Şirin	202	1970-01-01 00:00:00	Selamiçeşme	M	800	101	2		
Dilek	Mutlu	221	1984-04-04 00:00:00	Kasımpaşa	F	400	202	2		
Tolga	Kaymaz	222	1983-03-03 00:00:00	Beyoğlu	M	500	202	2		
Zeynep	Demir	303	1972-03-01 00:00:00	Bostancı	F	750	101	3		
Melek	Ertan	330	1976-05-05 00:00:00	Aksaray	F	500	303	3		
Leyla	Metin	331	1985-06-06 00:00:00	Kadıköy	F	550	303	3		
Emel	Temel	404	1979-05-01 00:00:00	Etiler	F	770	101	6		
Can	Tan	440	1970-05-05 00:00:00	Göztepe	M	600	404	4		
Candan	Taner	441	1977-07-07 00:00:00	Suadiye	F	700	404	4		
Ahmet	Kartal	505	1981-04-04 00:00:00	Beşiktaş	M	600	101	5		
Sezgin	Şener	550	1973-08-08 00:00:00	Çamlıca	M	750	505	5		
Merve	Caner	551	1976-03-03 00:00:00	Ümraniye	F	700	505	5		
Fatma	Atak	555	1979-12-16 00:00:00	Etiler	F	770	505	5		

Query 15: Retrieve all the fields and rows of tables Department and Employee for managers.

Output:

5 rows

Dno	DName	MgrSsn	MgrStartDate	FirstName	LastName	Ssn	Birthdate	Address	Gender	Salary	SuperSsn	Dno
1	Central Office	101	2002-10-20 00:00:00	Ali	Yılmaz	101	1977-01-11 00:00:00	Patika	Sok	11	Kadıköy	M
900	NULL	1										
2	R&D	202	2000-01-11 00:00:00	Veli	Şirin	202	1970-01-01 00:00:00	Selamiçeşme		M	800	101
2												
3	Sales	303	1999-01-01 00:00:00	Zeynep	Demir	303	1972-03-01 00:00:00	Bostancı	F	750	101	3
4	Marketing	404	2000-02-02 00:00:00	Emel	Temel	404	1979-05-01 00:00:00	Etiler	F	770	101	6
5	Human Resources	505	1998-02-03 00:00:00	Ahmet	Kartal	505	1981-04-04 00:00:00	Beşiktaş	M		600	101
5												

Notice that we have two "Dno".

Query 16: For every project located in "Kadıköy", list the project number, the controlling department number and the department manager's last name, address and birthdate.

Output:

4 rows

Pno	Dno	LastName	Address	Birthdate
1	1	Yılmaz	Patika Sok 11 Kadıköy	1977-01-11 00:00:00
2	1	Yılmaz	Patika Sok 11 Kadıköy	1977-01-11 00:00:00
6	2	Şirin	Selamiçeşme	1970-01-01 00:00:00
7	2	Şirin	Selamiçeşme	1970-01-01 00:00:00

Query 17: Retrieve ssn, last name of the employees who work for the departments 1, 2, and 4.

Output:

9 rows

Ssn	LastName
101	Yılmaz
111	Semiz
112	Beyza
132	Sezen
202	Şirin
221	Mutlu
222	Kaymaz
440	Tan
441	Taner

Query 18: Retrieve ssn, last name of the employees who work for the departments "Central Office", "R&D", and "Marketing".

Output:

9 rows

Ssn	LastName
101	Yılmaz
111	Semiz
112	Beyza
132	Sezen
202	Şirin
221	Mutlu
222	Kaymaz
440	Tan
441	Taner

Query 19: Retrieve the salary of every employee.

Output:

17 rows

Salary
900
550
500
800
800
400
500
750
500
550
770
600
700
600
750
700
770

Query 20: Retrieve all distinct salary values.

Output:

9 rows

Salary
400
500
550
600
700
750
770
800
900

Query 21: Make a list of all project numbers for projects that involve an employee whose last name is "Şirin" either as a manager of the department that controls the project or as a worker.

Output:

4 rows

Pno
3
5
6
7

Query 22: Retrieve ssn, first & last name of employees whose address is in "Kadıköy".

Output:

3 rows

Ssn	FirstName	LastName
101	Ali	Yılmaz
132	Veli	Sezen
331	Leyla	Metin

Query 23: Retrieve ssn, first & last name of employees whose first name starts with the letter "a" and the third character of last name is "r".

Output:

1 row

Ssn	FirstName	LastName
505	Ahmet	Kartal

Query 24: Show the resulting salaries in addition to ssn and last name if every employee working on the "Computer Education" project is given a 10 percent raise.

Output:

2 rows

Ssn	LastName	NewSalary
202	Şirin	880.0
404	Temel	847.0

Query 25: Retrieve a list of employees (ssn, first & last name) and the projects they are working on, ordered by department and; within each department, ordered alphabetically by last name, first name.

Output:

6 rows

Ssn	FirstName	LastName	DName	PName
101	Ali	Yılmaz	Central Office	Student Information System
101	Ali	Yılmaz	Central Office	Network Infrastructure
202	Veli	Şirin	R&D	Computer Education
303	Zeynep	Demir	Sales	Character Test
303	Zeynep	Demir	Sales	Total Quality Management
303	Zeynep	Demir	Sales	Accounting Software

What if DESC, ASC?
What if Order By 4, 3, 2?

Query 26: Retrieve the ssn, first & last names of all employees who do not have supervisors.

Output:

1 row

Ssn	FirstName	LastName
101	Ali	Yılmaz

NULL values?
-Unknown value: A particular person has a date of birth but it is not known, so it is represented by NULL in the database.
-Unavailable or withheld value: A person has a home phone but does not want it to be listed, so it is withheld and represented as NULL in the database.
-Not applicable attribute: An attribute LastCollegeDegree would be NULL for a person who has no college degrees, because it does not apply to that person.

What if Where SuperSsn=null?

Query 27: Retrieve the ssn, first & last names of all employees who do not work on any projects.

Output:

13 rows

Ssn	FirstName	LastName
111	Mehmet	Semiz
112	Meryem	Beyza
132	Veli	Sezen
221	Dilek	Mutlu
222	Tolga	Kaymaz

330	Melek	Ertan
331	Leyla	Metin
440	Can	Tan
441	Candan	Taner
505	Ahmet	Kartal
550	Sezgin	Şener
551	Merve	Caner
555	Fatma	Atak

Query 28: Retrieve the name of each employee who has a dependent with the same first name and same gender as the employee.

Output:

1 row

FirstName	LastName
Ali	Yılmaz

Query 29: Retrieve the names of employees who have no dependents.

Output:

14 rows

FirstName	LastName
Mehmet	Semiz
Meryem	Beyza
Veli	Sezen
Veli	Şirin
Dilek	Mutlu
Tolga	Kaymaz
Melek	Ertan
Leyla	Metin
Emel	Temel
Can	Tan
Candan	Taner
Sezgin	Şener
Merve	Caner
Fatma	Atak

Query 30: List the ssn and names of employees who have at least one dependent.

Output:

3 rows

Ssn	FirstName	LastName
101	Ali	Yılmaz
303	Zeynep	Demir
505	Ahmet	Kartal

Query 31: List the names of managers who have at least one dependent.

Output:

3 rows

Ssn	FirstName	LastName
101	Ali	Yılmaz
303	Zeynep	Demir
505	Ahmet	Kartal

Query 32: Find the sum of the salaries of all employees, the maximum salary, the minimum salary and the average salary.

Output:

1 row

(No column name)	(No column name)	(No column name)	(No column name)
11140	900	400	655

Query 33: Find the sum of the salaries of all employees of the department "Central Office", as well as the maximum salary, the minimum salary and the average salary in this department.

Output:

1 row

TotalSalaryCO	MaxSalaryCO	MinSalaryCO	AvgSalaryCO
2750	900	500	687

Query 34: How many employees are there in the company?

Output:

1 row

(No column name)
17

What if we write Count(Ssn), Count(Salary), Count(SuperSsn) instead of Count(*)?

Query 35: What is the number of employees in the department "Central Office"?

Output:

1 row

(No column name)
4

Query 36: Count the number of distinct salary values in the database.

Output:

1 row

(No column name)
9

Query 37: For each department; retrieve the department number and the number of employees in the department.

Output:

6 rows

Dno	NoOfEmp
NULL	1
1	4
2	3
3	3
4	2
5	4

<-OR->

5 rows

Dno	NoOfEmp
1	4
2	3
3	3
4	2
5	4

<-OR->

6 rows)

Dno	NoOfEmp
NULL	1
1	4
2	3
3	3
4	2
5	4

<-OR->

5 rows (+1)

Dno	NoOfEmp
1	4
2	3
3	3
4	2
5	4

<-OR->
5 rows (+1)

Dno	NoOfEmp
1	4
2	3
3	3
4	2
5	4

<-OR->
6 rows

Dno	NoOfEmp
NULL	1
1	4
2	3
3	3
4	2
5	4

<-OR->
6 rows (+1)

Dno	NoOfEmp
NULL	1
1	4
2	3
3	3
4	2
5	4

Query 38: For each department; retrieve the department number, the number of employees in the department and their average salary.

Output:
6 rows

Dno	NoOfEmp	AvgSalary
NULL	1	770
1	4	687
2	3	566
3	3	600
4	2	650
5	4	705

<-OR->

Dno	NoOfEmp	AvgSalary
NULL	1	770.000000
1	4	687.500000
2	3	566.666666
3	3	600.000000
4	2	650.000000
5	4	705.000000

Query 39: For each project; retrieve the project number, the project name and the number of employees who work on that project.

Output:
6 rows

Pno	PName	NoOfEmp
1	Student Information System	1
2	Network Infrastructure	1
3	Computer Education	2
4	Character Test	2
5	Total Quality Management	1
6	Accounting Software	1

Query 40: For each employee; retrieve ssn, last name and total number of hours worked on all projects.

Output:
17 rows

Ssn	LastName	TotalHours
101	Yılmaz	11
111	Semiz	NULL

112	Beyza	NULL
132	Sezen	NULL
202	Şirin	10
221	Mutlu	NULL
222	Kaymaz	NULL
303	Demir	22
330	Ertan	NULL
331	Metin	NULL
404	Temel	12
440	Tan	NULL
441	Taner	NULL
505	Kartal	NULL
550	Şener	NULL
551	Caner	NULL
555	Atak	NULL

How can we replace null with zero?

Query 41: For the employees that have dependents; retrieve ssn and the number of his/her dependents.

Output:

3 rows

Ssn	NoOfDependents
101	3
303	2
505	1

Query 42: For each employee; retrieve ssn, last name, total number of hours worked on all projects, and the number of his/her dependents.

Output:

17 rows

Ssn	LastName	TotalHours	NoOfDependents
101	Yılmaz	11	3
111	Semiz	NULL	NULL
112	Beyza	NULL	NULL
132	Sezen	NULL	NULL
202	Şirin	10	NULL
221	Mutlu	NULL	NULL
222	Kaymaz	NULL	NULL
303	Demir	22	2
330	Ertan	NULL	NULL
331	Metin	NULL	NULL
404	Temel	12	NULL
440	Tan	NULL	NULL
441	Taner	NULL	NULL
505	Kartal	NULL	1
550	Şener	NULL	NULL
551	Caner	NULL	NULL
555	Atak	NULL	NULL

<-OR-> Below is incorrect:

Ssn	LastName	TotalHours	NoOfDependents
101	Yılmaz	66	12
111	Semiz	NULL	0
112	Beyza	NULL	0
132	Sezen	NULL	0
202	Şirin	60	6
221	Mutlu	NULL	0
222	Kaymaz	NULL	0
303	Demir	132	18
330	Ertan	NULL	0
331	Metin	NULL	0
404	Temel	72	12
440	Tan	NULL	0
441	Taner	NULL	0
505	Kartal	NULL	0
550	Şener	NULL	0
551	Caner	NULL	0
555	Atak	NULL	0

What is the problem with the second query?

Query 43: For each project located in "Üsküdar"; retrieve ssn, project number and the total number of hours worked on.

Output:

4 rows

Ssn	Pno	TotHrs
202	3	10
303	4	11
404	3	5
404	4	7

Query 44: For each project on which at least one employee works; retrieve the project number, the project name and the number of employees who work on the project.

Output:

6 rows

Pno	PName	NoOfEmp
1	Student Information System	1
2	Network Infrastructure	1
3	Computer Education	2
4	Character Test	2
5	Total Quality Management	1
6	Accounting Software	1

Query 45: For each project on which more than one employee works; retrieve the project number, the project name and the number of employees who work on the project.

Output:

2 rows

Pno	PName	NoOfEmp
3	Computer Education	2
4	Character Test	2

Query 46: For each project on which more than one employee works, retrieve the project number.

Output:

2 rows

Pno
3
4

Query 47: For each department that has at least three employees with salary greater than $500; retrieve the department number, department name and the number of its employees with salary greater than $500.

Output:

2 rows

Dno	DName	NoOfEmp
1	Central Office	3
5	Human Resources	4

Query 48: For each department that has at least three employees; retrieve the department number, department name and the number of its employees.

Output:

4 rows

Dno	DName	NoOfEmp
1	Central Office	4
2	R&D	3
3	Sales	3
5	Human Resources	4

Query 49: For each department that has at least three employees; retrieve the department number, department name and the number of its employees with salary greater than $500.

Output:
4 rows

Dno	DName	NoOfEmp
1	Central Office	3
2	R&D	1
3	Sales	2
5	Human Resources	4

Query 50: For each employee who has at least two dependents; retrieve ssn, first & last name (concatenated, rename as "Full Name"), department name that s/he works for, total project hours worked, number of projects worked on and average project hours worked on. Discard the employees who does not work on at least three projects. Order the list by department name ascending and average hours descending.

Output:
1 row

Ssn	Full Name	DName	TotHrs	NoOfProj	AvgHrs
303	Zeynep Demir	Sales	22	3	7.333333

Query 51: Insert a new record to table WorksOn with values Ssn=505, Pno=7, and Hours=8.

Output:
1 row affected
What if we change the order of the fields?
What if we only enter the values for Ssn and Pno?

Query 52: Delete the records on table WorksOn with values Ssn=505 and Pno=7.

Output:
1 row affected

What if we only use Ssn in where clause?

Query 53: Delete the employees who work on projects at most 3 hours.

Output:
n rows affected

Query 54: Update the address of "Meryem Beyza" as "Ataşehir".

Output:
1 row affected

Query 55: Update the salaries by 20% of the employees of department "Sales" those work on projects more than 5 hours.

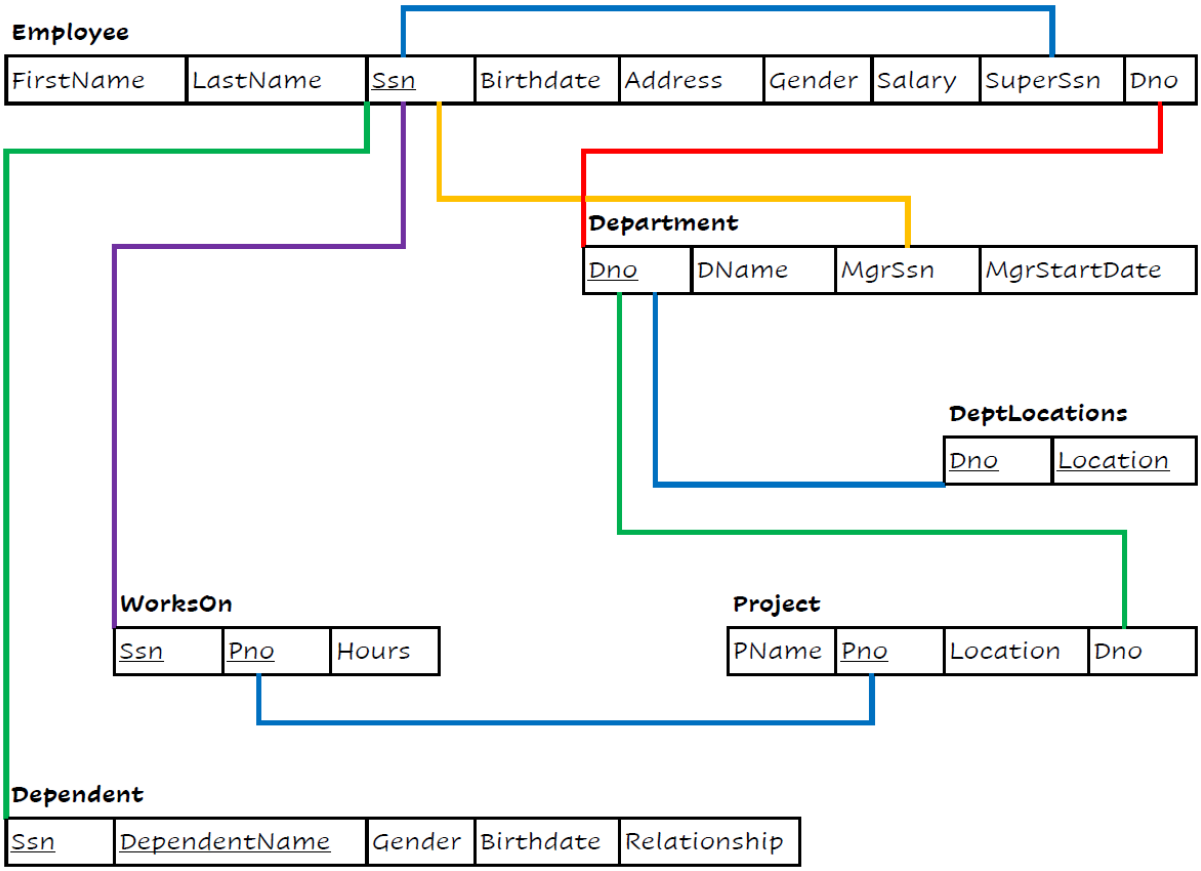
Output:
1 row affected

Query 56: Create a table UserLog with fields LogID, UserID, and LogDescription. LogID will be unique, and UserID will reference Ssn of Employee.

Output:
Commands completed successfully

Query 57: Add a new field LogDate to table UserLog.

Output:
Commands completed successfully



Reference: Fundamentals of Database Systems, R. Elmasri & S.B. Navathe, Addison Wesley.