



**Cairo University,
Faculty of Computers and Artificial Intelligence
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**Database systems
IS211
Research Project**

Introduction to Database systems

(PM-2183)

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Final Assessment Project

Online Recruitment Project

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Chapter 1: Introduction:

1.1: Description of the project idea:

Online employment projects allow a greater number of people, especially young people, to apply for the largest number of jobs suitable for them and their skills, and also facilitate the matter for job providers to reach the largest number of people suitable for the job offered, thus these sites have facilitated the matter instead of going to the company's headquarters with its waste For time and effort.

On these sites companies and their representatives offer jobs with all their details as the name of the job, the required skills, the expiry date of the application and the level of the person required in terms of experience in the field of the job offered, then the sites allow young people to apply for those jobs and send their required data to the job holder and send their CV, then after that the process is completed Filter and choose the most suitable person for this job.

Employment platforms work remotely by creating an account for each person with the addition of all the required data that companies need from their job applicants. Then, after the availability of these sites, the ability to search for new jobs and filter them according to field, time and other types, and result in communication with job providers, among the most famous of these sites are LinkedIn, Wuzzuf and many other sites.

It is good for anyone to have an account on one of these sites, which gives them more and better opportunities.

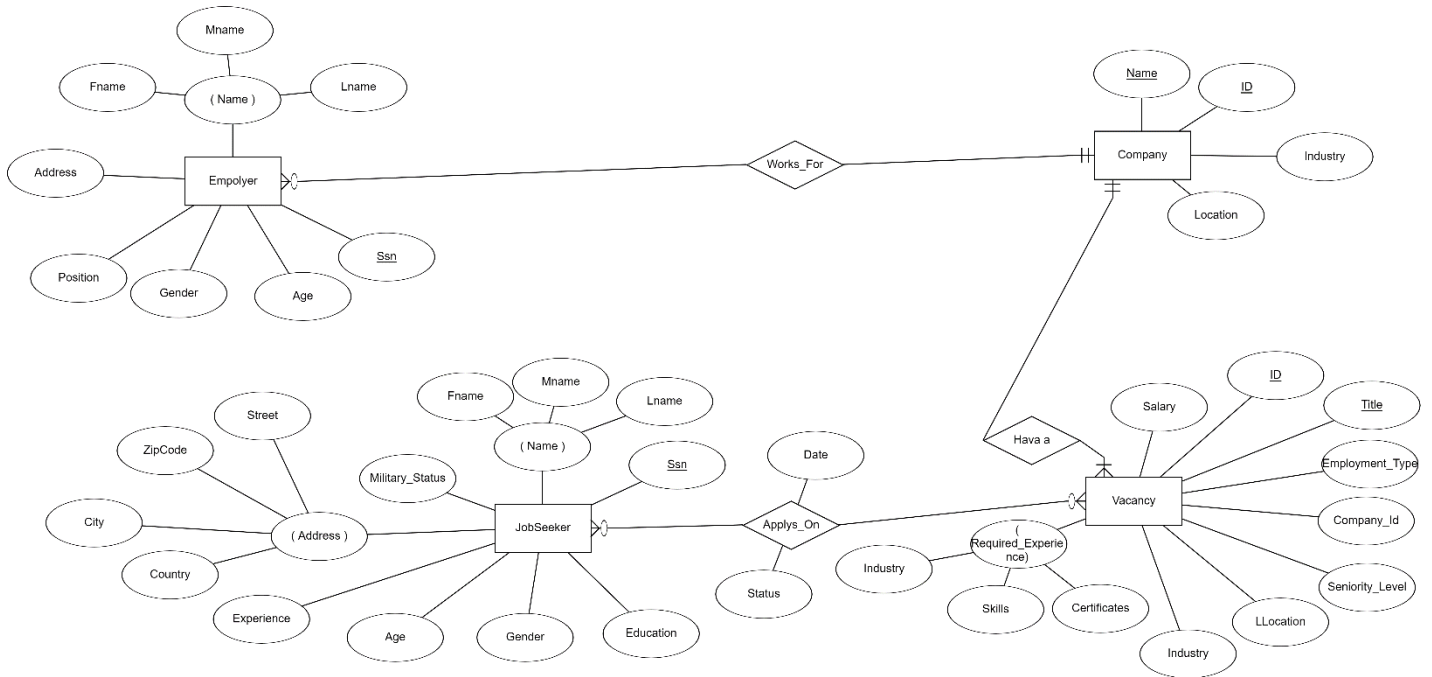
1.2: Technology and tools used:

To launch this project, we used:

1. Microsoft SQL Server Management Studio. (For SQL)
 2. ERD Plus. (For ERD Model & Physical Model)
-
- We used The Entity Relationship Model to design the ERD Model.
 - We used an algorithm to map the ERD Model to Relational Schema.
 - We used the SQL to make the project a real.

Chapter 2: Analysis:

2.1: DB Conceptual ERD:



To draw this ERD Model we used ERD Plus Website.

In this ERD Model there are several things to explain, First, we have JobSeeker Relation, that contains the following attributes: Name (as a composite attribute), Ssn as primary key, Education, Gender, Age, Military_Status, and Address also as composite attribute.

Second, we have Employer Relation, that contains the following attributes: Name (as composite attribute), Address also as composite attribute, Age, Gender, Position, Ssn as primary key.

Third, Company Relation that contains the following attributes: Name, Id, Industry, and Location, and the Id is the primary Key.

Forth, Vacancy Relation that contains the following attributes: Id as primary key, Salary, Title, Employment type, company id, seniority level, location, industry, and required experience.

2.2: DB Physical ERD:

1. Job Seeker Relation (Table):

```
CREATE TABLE JobSeeker(  
  Fname VARCHAR(15),  
  Mname VARCHAR(15),  
  Lname VARCHAR(15),  
  Ssn INT NOT NULL PRIMARY KEY,  
  Gender CHAR,  
  AGE INT,  
  Military_Status VARCHAR(15),  
  Education VARCHAR(15),  
  Experience INT,  
  Address int)
```

<u>Ssn</u>
Fname
Mname
Lname
Gender
Age
Military_Status
Address
Education
Experience

2. Employer Relation:

```
CREATE TABLE Employer(  
  Fname VARCHAR(15),  
  Mname VARCHAR(15),  
  Lname VARCHAR(15),  
  Ssn INT NOT NULL PRIMARY KEY,  
  Gender CHAR,  
  Salary INT,  
  Company_Id INT,  
  AGE INT,  
  Position VARCHAR(15),  
  Address int)
```

<u>Ssn</u>
Fname
Mname
Lname
Age
Gender
CompanyId
Address
Position
Salary

3. Vacancy Relation:

```
CREATE TABLE Vacancy(  
  Id INT NOT NULL PRIMARY KEY,  
  Salary INT,  
  Seniority_Level VARCHAR(15),  
  Industry VARCHAR(15),  
  Employment_Type VARCHAR(15),  
  LLocation VARCHAR(15),  
  Title VARCHAR(15),  
  Req_Experience_Id INT,  
  Company_Id INT)
```

<u>ID</u>
Title
Salary
Seniority_Level
Industry
Employment_Type
Required_Experience
CompanyId
LLocation

4. Company Relation:

```
CREATE TABLE Company(  
  Id INT NOT NULL PRIMARY KEY,  
  Nname VARCHAR(15),  
  Industry VARCHAR(15),  
  LLocation VARCHAR(15))
```

<u>ID</u>
Name
Industry
Location

5. Applys_on Relation:

```
CREATE TABLE Applys_On(  
  JS_Id INT,  
  V_Id INT,  
  Ddate VARCHAR(15),  
  PRIMARY KEY (JS_Id,V_Id));
```

Applys On	
JobSeeker Ssn	Vacancy ID
Date	

Chapter 3: SQL Queries + screenshots of the results:

SQL Statements:

```
CREATE DATABASE Recruitment;
```

```
--Table JobSeeker -----
```

```
CREATE TABLE JobSeeker(  
  Fname VARCHAR(15),  
  Mname VARCHAR(15),  
  Lname VARCHAR(15),  
  Ssn INT NOT NULL PRIMARY KEY,  
  Gender CHAR,  
  AGE INT,  
  Military_Status VARCHAR(15),  
  Education VARCHAR(15),  
  Experience INT,  
  Address int)
```

```
-- 1) Signing up a new user (Job Seeker): Add new job seeker.
```

```
insert into JobSeeker values('Kareem','hasan','mohamed',542,'M',25,'Done','CS',3,12);  
insert into JobSeeker values('ahmed','yousef','mohamed',156,'M',20,'Done','CS',2,5);  
insert into JobSeeker values('ahmed','hessuien','mazen',123,'M',15,'Done','IT',5,10);  
insert into JobSeeker values('yousef','essam','kareem',897,'M',15,'Done','IS',3,7);  
insert into JobSeeker values('hazem','tareq','mohamed',515,'M',35,'Done','DS',4,3);  
insert into JobSeeker values('nader','ahmed','ramadan',564,'M',24,'Done','AI',3,1);  
insert into JobSeeker values('essam','walled','mohey',111,'M',22,'Done','CS',8,2);  
insert into JobSeeker values('dina','ahmed','khaled',496,'F',21,'Done','IT',2,5);
```

```
-- 2) Update user details
```

```
update JobSeeker  
set Fname='Jhon'  
where Ssn=515;  
select * from JobSeeker
```

```
-- 3) Showing a list of job seekers that satisfy certain criteria (e.g. industry,  
location, experience...)
```

```
-- 1]  
select *  
from JobSeeker  
where JobSeeker.Education='CS';  
-- 2]  
select *  
from JobSeeker
```

```

where JobSeeker.Address=1;
-- 3]
select *
from JobSeeker
where JobSeeker.Experience=3;

--
*****

-----

-- Table Employer -----
-----
CREATE TABLE Employer(
Fname VARCHAR(15),
Mname VARCHAR(15),
Lname VARCHAR(15),
Ssn INT NOT NULL PRIMARY KEY,
Gender CHAR,
Salary INT,
Company_Id INT,
AGE INT,
Position VARCHAR(15),
Address int)

-- 2) Signing up a new user (Employer): Add new employer.
insert into Employer Values('Ahmed', 'mohamed', 'hasan', 123, 'M', 1200, 1, 20, 'HR', 12);
insert into Employer Values('mohamed', 'yasser', 'hasan', 456, 'M', 1566, 1, 25, 'HR', 3);
insert into Employer Values('mazen', 'kareem', 'yosef', 213, 'M', 2500, 3, 28, 'IT', 10);
insert into Employer Values('mona', 'mohamed', 'eslam', 494, 'F', 3000, 4, 22, 'DEV', 7);
insert into Employer Values('fares', 'ahmed', 'ahmed', 159, 'M', 2500, 2, 25, 'AD', 5);
insert into Employer Values('abdelrhman', 'khaled', 'ahmed', 157, 'M', 1200, 1, 29, 'Full
s', 2);
insert into Employer
Values('mohamed', 'khaled', 'yousef', 255, 'M', 2500, 2, 30, 'Manager', 1);
insert into Employer Values('amir', 'mohamed', 'nader', 128, 'M', 1600, 4, 19, 'HR', 7);

-- 2) Update user details
update Employer
set Fname='salma'
where Ssn=494;
select * from Employer
--
*****

-----

-- Table Vacancy -----
-----
CREATE TABLE Vacancy(
Id INT NOT NULL PRIMARY KEY,
Salary INT,
Seniority_Level VARCHAR(15),
Industry VARCHAR(15),
Employment_Type VARCHAR(15),
LLocation VARCHAR(15),

```



```

Title VARCHAR(15),
Req_Experience_Id INT,
Company_Id INT)

ALTER TABLE Vacancy
ADD E_Id INT;

-- 1) Add a new vacancy:
insert into Vacancy Values(1,1000,'Senior','Technology','Full-Time','Giza','Senior
AD',1,1);
insert into Vacancy Values(2,1400,'Junior','Hr','Full-Time','cairo','junior hr',2,2);
insert into Vacancy Values(3,2500,'Senior','Security','part-Time','Giza','seniro
it',3,1);
insert into Vacancy Values(4,3000,'Mid-Junior','Database','remote','alex','database
des',3,4);
insert into Vacancy Values(5,1500,'Mid-Senior','Home data','part-Time','cairo','mid
hd',4,3);
insert into Vacancy Values(6,2560,'Junior','clouding','Full-Time','cairo','junior
DB',2,2);
insert into Vacancy Values(7,3900,'Mid-Senior','mobile','Internship','mina','mid
AD',3,1);
select * from Vacancy

update Vacancy set E_Id = 123 where Vacancy.Id = 1
update Vacancy set E_Id = 123 where Vacancy.Id = 2
update Vacancy set E_Id = 213 where Vacancy.Id = 7
update Vacancy set E_Id = 456 where Vacancy.Id = 3
update Vacancy set E_Id = 159 where Vacancy.Id = 5
update Vacancy set E_Id = 128 where Vacancy.Id = 4
update Vacancy set E_Id = 128 where Vacancy.Id = 6

-- 2) Update vacancy:
update Vacancy
set Title='Admin'
where Id=4;
select * from Vacancy
-- 3) Showing a list of vacancies that satisfy certain criteria (e.g. industry,
location, required experience...)
-- 1]
select *
from Vacancy
where Vacancy.Industry='Security';
-- 2]
select *
from Vacancy
where Vacancy.LLocation='Cairo';
-- 3]
select *
from Vacancy
where Vacancy.Req_Experience_Id=1;

-- 4) Hide a vacancy (Employer)
Delete From Vacancy Where Vacancy.Title = 'database des';
select * from Vacancy
--
*****
*****

```

```

-- Table Company -----
CREATE TABLE Company(
Id INT NOT NULL PRIMARY KEY,
Nname VARCHAR(15),
Industry VARCHAR(15),
LLocation VARCHAR(15))
insert into Company Values(1,'Google','Programming','Selicon Valley');
insert into Company Values(2,'Microsoft','Windows','Cairo');
insert into Company Values(3,'Amazon','WebSerivces','New York');
insert into Company Values(4,'Apple','Mobile','China');
--
*****
*****

```

```

-- Table Address -----
CREATE TABLE Address(
Country VARCHAR(15) not null,
City VARCHAR(15) not null,
ZipCode INT not null,
Address_Id int not null primary key)
insert into Address Values('Egypt','Cairo',12518,12);
insert into Address Values('Egypt','Giza',12354,5);
insert into Address Values('Egypt','Alex',48995,1);
insert into Address Values('Egypt','Minofia',46513,3);
insert into Address Values('Egypt','Sina',12418,7);
insert into Address Values('Egypt','Embaba',18518,10);
insert into Address Values('Egypt','Aswan',12345,2);
--
*****
*****

```

```

-- Table Required_Experience -----
CREATE TABLE Required_Experience(
Id INT NOT NULL PRIMARY KEY,
Ex1 VARCHAR(15) ,
Ex2 VARCHAR(15) ,
Ex3 VARCHAR(15) ,
Ex4 VARCHAR(15) )
insert into Required_Experience values(1,'C++','java','sql','c#')
insert into Required_Experience values(2,'C#','php','math','network')
insert into Required_Experience values(3,'api','css','logic','php')
insert into Required_Experience values(4,'mysql','js','technical','stat')
--
*****
*****

```

```

-- Table Applys_On -----
-----
CREATE TABLE Applys_On(
JS_Id INT,
V_Id INT,
Ddate VARCHAR(15),
PRIMARY KEY (JS_Id,V_Id));

-- 1) Apply and Save vacancy (Job Seeker)
insert into Applys_On Values(542,1, '12/5/2015')
insert into Applys_On values(156,5, '2/4/2020');
insert into Applys_On Values(123,5, '12/5/2015')
insert into Applys_On Values(515,1, '12/5/2015')
insert into Applys_On Values(496,1, '12/5/2015')
insert into Applys_On Values(111,6, '12/5/2015')
insert into Applys_On Values(897,5, '12/5/2015')
insert into Applys_On Values(111,2, '10/7/2015')
insert into Applys_On Values(897,3, '10/2/2019')
insert into Applys_On Values(111,4, '10/2/2019')
select * from Applys_On
--
*****
*****

-----

-- Adding Foreign key for the tables -----
-----

ALTER TABLE Employer ADD FOREIGN KEY (Company_Id) REFERENCES Company (Id);
ALTER TABLE JobSeeker ADD FOREIGN KEY (Address) REFERENCES Address (Address_Id);
ALTER TABLE Employer ADD FOREIGN KEY (Address) REFERENCES Address (Address_Id);
ALTER TABLE Vacancy ADD FOREIGN KEY (Req_Experience_Id) REFERENCES Required_Experience
(Id);
ALTER TABLE Vacancy ADD FOREIGN KEY (Company_Id) REFERENCES Company (Id);
ALTER TABLE Vacancy ADD FOREIGN KEY (E_Id) REFERENCES Employer (Ssn);
alter table Applys_On ADD FOREIGN KEY(JS_Id) References JobSeeker(Ssn);
alter table Applys_On ADD FOREIGN KEY(V_Id) References Vacancy(Id);
--
*****
*****

-----

```

SQL Queries:

```
-- Query No. (1) -----
-----
--What was the most interesting job "title" that had maximum number of applicants?

select top 1 Appls_On.V_Id,Count(*) as maxApplicants
from Appls_On
Group By Appls_On.V_Id
order by maxApplicants desc;
-- Testing of the query:
select * from Db
select Vacancy.Title
from Db , Vacancy
where Db.V_Id=Vacancy.Id
--
*****
*****

-----

-- Query No. (2) -----
-----
-- What was the announced job "title" that hadn't any applicants last month?
select Vacancy.Id from Vacancy
except(select DBTabl.V_Id from DBTabl)
-- this is the ids of the job title that hadn't any applicants last month
--
*****
*****

-----

-- Query No. (3) -----
-----
-- Who was the employer with the maximum announcements last month?
select Top 1 Vacancy.E_Id ,count(*) as number
from Vacancy
Group by Vacancy.E_Id
order by number desc
--
*****
*****

-----

-- Query No. (4) -----
-----
-- Who were the employers didn't announce any job last month?
select Vacancy.E_Id ,count(*) as number into Active_Employers
from Vacancy
Group by Vacancy.E_Id
order by number desc
-- Testing of the query:
select Employer.Ssn from Employer
except(select Active_Employers.E_Id from Active_Employers)
--
*****
*****
```

```

-----
-- Query No. (5) -----
-----
-- What were the available positions at each employer last month?
select Vacancy.Id from Vacancy
except(select DBTabl.V_Id from DBTabl)

-- Testing of the query:
select Vacancy.Title,Vacancy.E_Id from Vacancy
where Vacancy.Id Not in(select DBTabl.V_Id from DBTabl)
--
*****
****

```

```

-----
-- Query No. (6) -----
-----
-- For each seeker, retrieve all his/her information and the number of jobs he applied
for
select Applys_On.JS_Id,Count(*) as no_of_jobs_applied into DD
from Applys_On
Group By Applys_On.JS_Id
-- Testing of the query:
select * from DD
select *
from (JobSeeker full outer join DD on JobSeeker.Ssn=DD.JS_Id)

--
*****
****

```

```

-- Queries to test SQL Statements
select * from JobSeeker;
select * from Employer;
select * from Company;
select * from Vacancy;
select * from Address;
select * from Required_Experience;
--*****
select * into DBTable
from JobSeeker
where JobSeeker.Gender = 'F';
--*****
select *
from DBTabl;
select *
from Applys_On
where Applys_On.V_Id=1;
select Vacancy.Title
from Vacancy,Applys_On;
--*****
select *
from JobSeeker,Applys_On
where JobSeeker.Ssn in (select Applys_On.JS_Id from Applys_On)
--*****
select Applys_On.JS_Id,Count(*) as no_of_jobs_applied
from Applys_On
Group By Applys_On.JS_Id

```

Screenshots:

1. Signing up new user (job seeker)

The screenshot shows the Microsoft SQL Server Enterprise Manager interface. The left pane displays the 'Object Explorer' with the 'Recruitment' database selected. The right pane shows a query window with the following SQL code:

```
insert into JobSeeker values('nader','ahmed','ramadan',564,'M',24,'Done','AI',3,1);
insert into JobSeeker values('essam','walled','mohey',111,'M',22,'Done','CS',8,2);
insert into JobSeeker values('dina','ahmed','khaled',496,'F',21,'Done','IT',2,5);
select * from JobSeeker
-- 2) Update user details
update JobSeeker
set FName='Ahmed'
where Ssn=897;
-- 3) Showing a list of job seekers that satisfy certain criteria (e.g. industry, location, experience...)
select *
from JobSeeker
```

The 'Results' pane shows the output of the query, displaying a table with 8 rows and 10 columns: FName, Mname, Lname, Ssn, Gender, AGE, Military_Status, Education, Experience, and Address.

	FName	Mname	Lname	Ssn	Gender	AGE	Military_Status	Education	Experience	Address
1	essam	walled	mohey	111	M	22	Done	CS	8	2
2	ahmed	hessam	mazen	123	M	15	Done	IT	5	10
3	ahmed	yousef	moh	156	M	20	Done	CS	2	5
4	dina	ahmed	khaled	496	F	21	Done	IT	2	5
5	hazem	tareq	moh	515	M	35	Done	DB	4	3
6	Kare	hasan	moh	542	M	25	Done	CS	3	12
7	nader	ahmed	ramad	564	M	24	Done	AI	3	1
8	Ahmed	essam	kareem	897	M	15	Done	IS	3	7

The status bar at the bottom indicates 'Query executed successfully.' and 'DESKTOP-KM1EAAM (14.0 RTM)'. The bottom status bar shows 'Ln 69 Col 1 Ch 1 INS'.

2. Signing up new user (employer)

The screenshot shows the Microsoft SQL Server Enterprise Manager interface. The left pane displays the 'Object Explorer' with the 'Recruitment' database selected. The right pane shows a query window with the following SQL code:

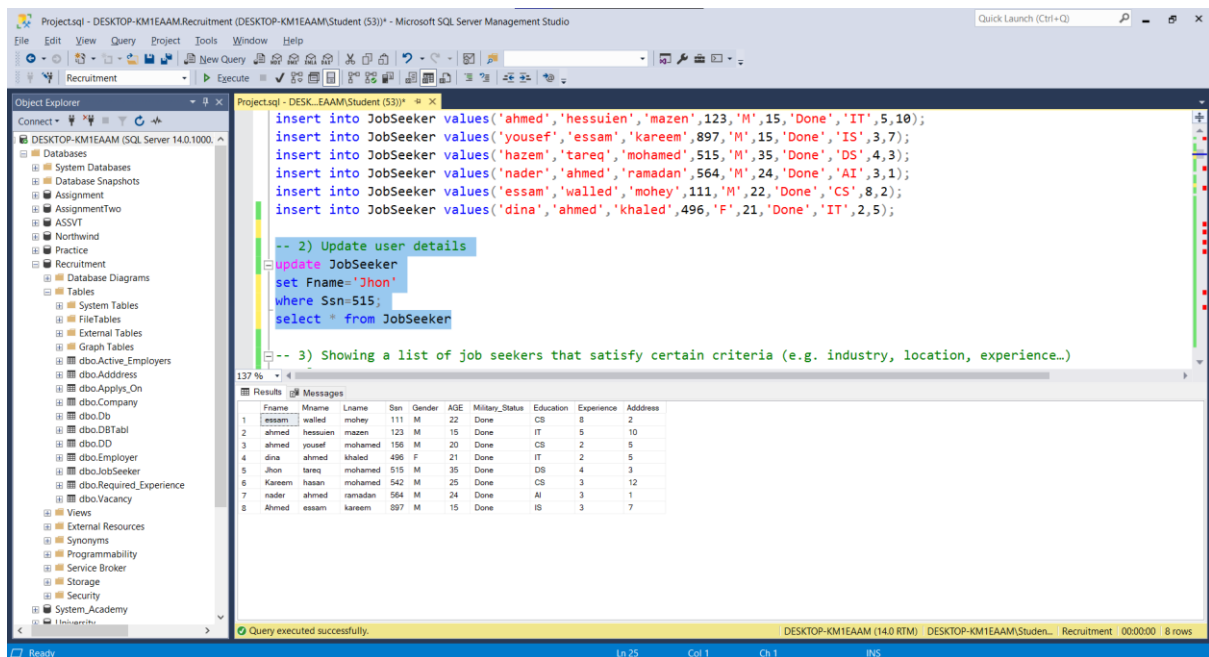
```
insert into Employer Values('abdelrhman','khaled','ahmed',157,'M',1200,1,29,'Full s',2);
insert into Employer Values('mohamed','khaled','yousef',255,'M',2500,2,30,'Manager',1);
insert into Employer Values('amir','mohamed','nader',128,'M',1600,4,19,'HR',7);
select * from Employer
-- 2) Update user details
update Employer
set FName='salma'
where Ssn=494;
-- Table Vacancy -----
CREATE TABLE Vacancy(
Id INT NOT NULL PRIMARY KEY,
```

The 'Results' pane shows the output of the query, displaying a table with 8 rows and 10 columns: FName, Mname, Lname, Ssn, Gender, Salary, Company_Id, AGE, Position, and Address.

	FName	Mname	Lname	Ssn	Gender	Salary	Company_Id	AGE	Position	Address
1	Ahmed	mohamed	hasan	123	M	1200	1	20	HR	12
2	amir	mohamed	nader	128	M	1600	4	19	HR	7
3	abdelrhman	khaled	ahmed	157	M	1200	1	29	Full s	2
4	fares	ahmed	ahmed	159	M	2500	2	25	AD	5
5	mazen	kareem	yousef	213	M	2500	3	28	IT	10
6	mohamed	khaled	yousef	255	M	2500	2	30	Manager	1
7	mohamed	yasser	hasan	456	M	1500	1	25	HR	3
8	mona	mohamed	eslam	494	F	3000	4	22	DEV	7

The status bar at the bottom indicates 'Query executed successfully.' and 'DESKTOP-KM1EAAM (14.0 RTM)'. The bottom status bar shows 'Ln 69 Col 1 Ch 1 INS'.

3. Update user details (job seeker)



The screenshot shows the Microsoft SQL Server Enterprise Manager interface. The left pane displays the Object Explorer with the 'Recruitment' database selected. The central query window contains the following SQL code:

```
insert into JobSeeker values('ahmed','hessuien','mazen',123,'M',15,'Done','IT',5,10);
insert into JobSeeker values('yousef','essam','kareem',897,'M',15,'Done','IS',3,7);
insert into JobSeeker values('hazem','tareq','mohamed',515,'M',35,'Done','DS',4,3);
insert into JobSeeker values('nader','ahmed','ramadan',564,'M',24,'Done','AI',3,1);
insert into JobSeeker values('essam','walled','mohey',111,'M',22,'Done','CS',8,2);
insert into JobSeeker values('dina','ahmed','khaled',496,'F',21,'Done','IT',2,5);

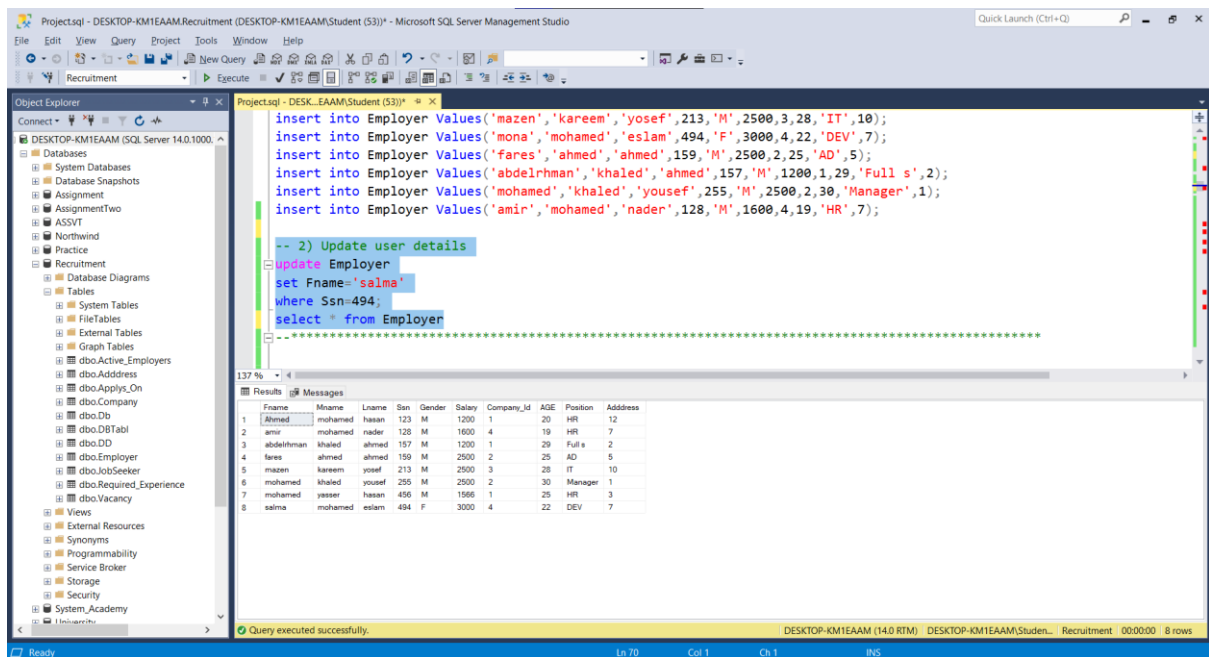
-- 2) Update user details
update JobSeeker
set FName='Jhon'
where Ssn=515;
select * from JobSeeker

-- 3) Showing a list of job seekers that satisfy certain criteria (e.g. industry, location, experience...)
```

The Results window shows the output of the update query, displaying a list of job seekers with columns: FName, Mname, Lname, Ssn, Gender, AGE, Military_Status, Education, Experience, and Address.

FName	Mname	Lname	Ssn	Gender	AGE	Military_Status	Education	Experience	Address
essam	walled	mohey	111	M	22	Done	CS	8	2
ahmed	hessuien	mazen	123	M	15	Done	IT	5	10
ahmed	yousef	mohamed	156	M	20	Done	CS	2	5
dina	ahmed	khaled	496	F	21	Done	IT	2	5
ahmed	tareq	mohamed	515	M	35	Done	DS	4	3
Kareem	hasan	mohamed	542	M	25	Done	CS	3	12
nader	ahmed	ramadan	564	M	24	Done	AI	3	1
Ahmed	essam	kareem	897	M	15	Done	IS	3	7

4. Update user details (employer)



The screenshot shows the Microsoft SQL Server Enterprise Manager interface. The left pane displays the Object Explorer with the 'Recruitment' database selected. The central query window contains the following SQL code:

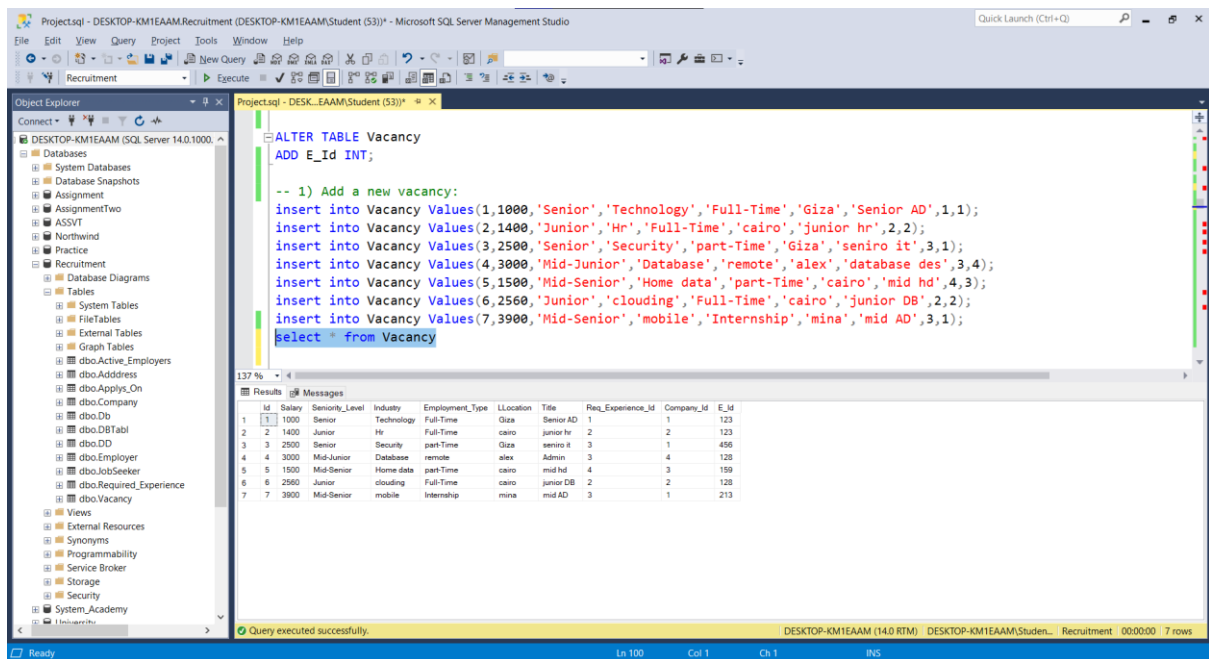
```
insert into Employer Values('mazen','kareem','yosef',213,'M',2500,3,28,'IT',10);
insert into Employer Values('mona','mohamed','eslam',494,'F',3000,4,22,'DEV',7);
insert into Employer Values('fares','ahmed','ahmed',159,'M',2500,2,25,'AD',5);
insert into Employer Values('abdelrhman','khaled','ahmed',157,'M',1200,1,29,'Full s',2);
insert into Employer Values('mohamed','khaled','yousef',255,'M',2500,2,30,'Manager',1);
insert into Employer Values('amir','mohamed','nader',128,'M',1600,4,19,'HR',7);

-- 2) Update user details
update Employer
set FName='salma'
where Ssn=494;
select * from Employer
```

The Results window shows the output of the update query, displaying a list of employers with columns: FName, Mname, Lname, Ssn, Gender, Salary, Company_Id, AGE, Position, and Address.

FName	Mname	Lname	Ssn	Gender	Salary	Company_Id	AGE	Position	Address
Ahmed	mohamed	hasan	123	M	1200	1	20	HR	12
amir	mohamed	nader	128	M	1600	4	19	HR	7
abdelrhman	khaled	ahmed	157	M	1200	1	29	Full s	2
fares	ahmed	ahmed	159	M	2500	2	25	AD	5
mazen	kareem	yosef	213	M	2500	3	28	IT	10
mohamed	khaled	yousef	255	M	2500	2	30	Manager	1
mohamed	yasser	hasan	456	M	1500	1	25	HR	3
salma	mohamed	eslam	494	F	3000	4	22	DEV	7

5. Add a new vacancy:



The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left displays the database structure for 'DESKTOP-KM1EAAM'. The Query Editor in the center contains the following SQL script:

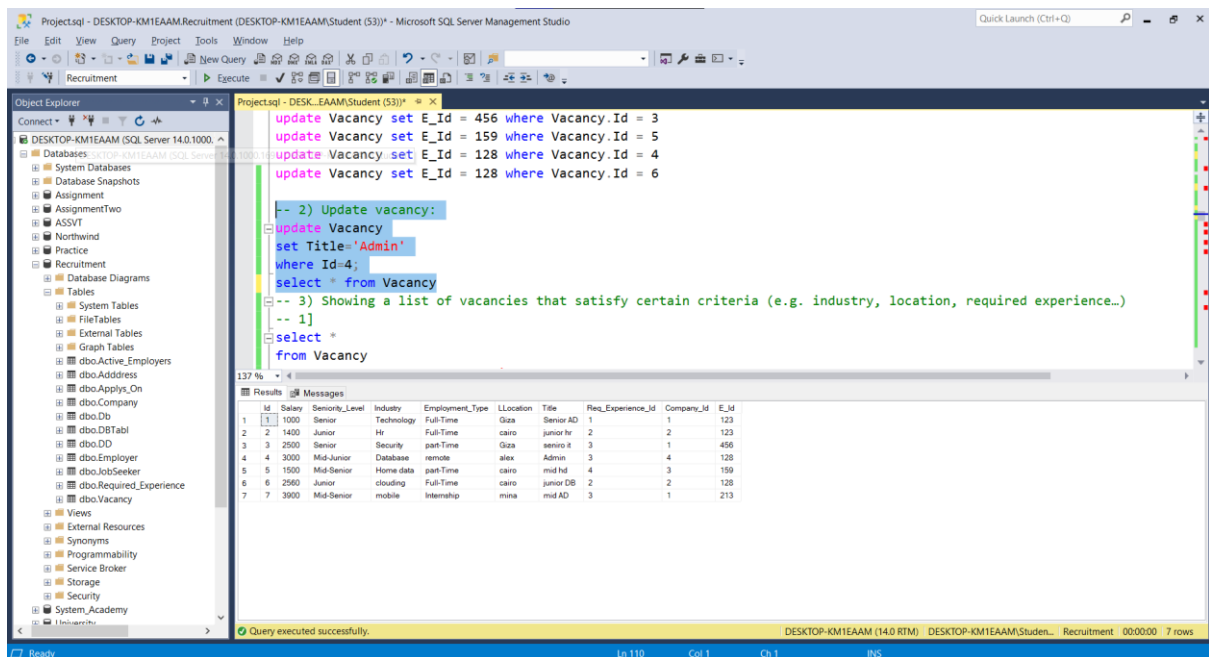
```
ALTER TABLE Vacancy
ADD E_Id INT;

-- 1) Add a new vacancy:
insert into Vacancy Values(1,1000,'Senior','Technology','Full-Time','Giza','Senior AD',1,1);
insert into Vacancy Values(2,1400,'Junior','Hr','Full-Time','cairo','junior hr',2,2);
insert into Vacancy Values(3,2500,'Senior','Security','part-Time','Giza','senior it',3,1);
insert into Vacancy Values(4,3000,'Mid-Junior','Database','remote','alex','database des',3,4);
insert into Vacancy Values(5,1500,'Mid-Senior','Home data','part-Time','cairo','mid hd',4,3);
insert into Vacancy Values(6,2560,'Junior','clouding','Full-Time','cairo','junior DB',2,2);
insert into Vacancy Values(7,3900,'Mid-Senior','mobile','Internship','mina','mid AD',3,1);
select * from Vacancy
```

The Results pane shows the output of the query, displaying 7 rows of data from the Vacancy table:

Id	Salary	Security_Level	Industry	Employment_Type	Llocation	Title	Req_Experience_Id	Company_Id	E_Id
1	1000	Senior	Technology	Full-Time	Giza	Senior AD	1	1	123
2	1400	Junior	Hr	Full-Time	cairo	junior hr	2	2	123
3	2500	Senior	Security	part-Time	Giza	senior it	3	1	456
4	3000	Mid-Junior	Database	remote	alex	Admin	3	4	128
5	1500	Mid-Senior	Home data	part-Time	cairo	mid hd	4	3	159
6	2560	Junior	clouding	Full-Time	cairo	junior DB	2	2	128
7	3900	Mid-Senior	mobile	Internship	mina	mid AD	3	1	213

6. Update vacancy:



The screenshot shows the Microsoft SQL Server Management Studio interface. The Query Editor in the center contains the following SQL script:

```
update Vacancy set E_Id = 456 where Vacancy.Id = 3
update Vacancy set E_Id = 159 where Vacancy.Id = 5
update Vacancy set E_Id = 128 where Vacancy.Id = 4
update Vacancy set E_Id = 128 where Vacancy.Id = 6

-- 2) Update vacancy:
update Vacancy
set Title='Admin'
where Id=4;
select * from Vacancy

-- 3) Showing a list of vacancies that satisfy certain criteria (e.g. industry, location, required experience..)
-- 1]
select *
from Vacancy
```

The Results pane shows the output of the query, displaying 7 rows of data from the Vacancy table:

Id	Salary	Security_Level	Industry	Employment_Type	Llocation	Title	Req_Experience_Id	Company_Id	E_Id
1	1000	Senior	Technology	Full-Time	Giza	Senior AD	1	1	123
2	1400	Junior	Hr	Full-Time	cairo	junior hr	2	2	123
3	2500	Senior	Security	part-Time	Giza	senior it	3	1	456
4	3000	Mid-Junior	Database	remote	alex	Admin	3	4	128
5	1500	Mid-Senior	Home data	part-Time	cairo	mid hd	4	3	159
6	2560	Junior	clouding	Full-Time	cairo	junior DB	2	2	128
7	3900	Mid-Senior	mobile	Internship	mina	mid AD	3	1	213

7. Showing a list of vacancies that satisfy certain criteria:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left displays the database structure for 'DESKTOP-KM1EAAM (SQL Server 14.0.1000)'. The query window on the right contains the following SQL code:

```
-- 3) Showing a list of vacancies that satisfy certain criteria (e.g. industry, location, required experience...)
-- 1]
select *
from Vacancy
where Vacancy.Industry='Security';
-- 2]
select *
from Vacancy
where Vacancy.LLocation='Cairo';
-- 3]
select *
from Vacancy
where Vacancy.Req_Experience_Id=1;
```

The Results pane shows the output of the query, displaying a table with columns: Id, Salary, Seniority_Level, Industry, Employment_Type, LLocation, Title, Req_Experience_Id, Company_Id, and E_Id. The data is as follows:

Id	Salary	Seniority_Level	Industry	Employment_Type	LLocation	Title	Req_Experience_Id	Company_Id	E_Id
1	2500	Senior	Security	part-Time	Giza	senior it	3	1	456

The status bar at the bottom indicates 'Query executed successfully' and 'DESKTOP-KM1EAAM (14.0 RTM) | DESKTOP-KM1EAAM/Studen... | Recruitment | 00:00:00 | 5 rows'.

8. Showing a list of job seekers that satisfy certain criteria:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left displays the database structure for 'DESKTOP-KM1EAAM (SQL Server 14.0.1000)'. The query window on the right contains the following SQL code:

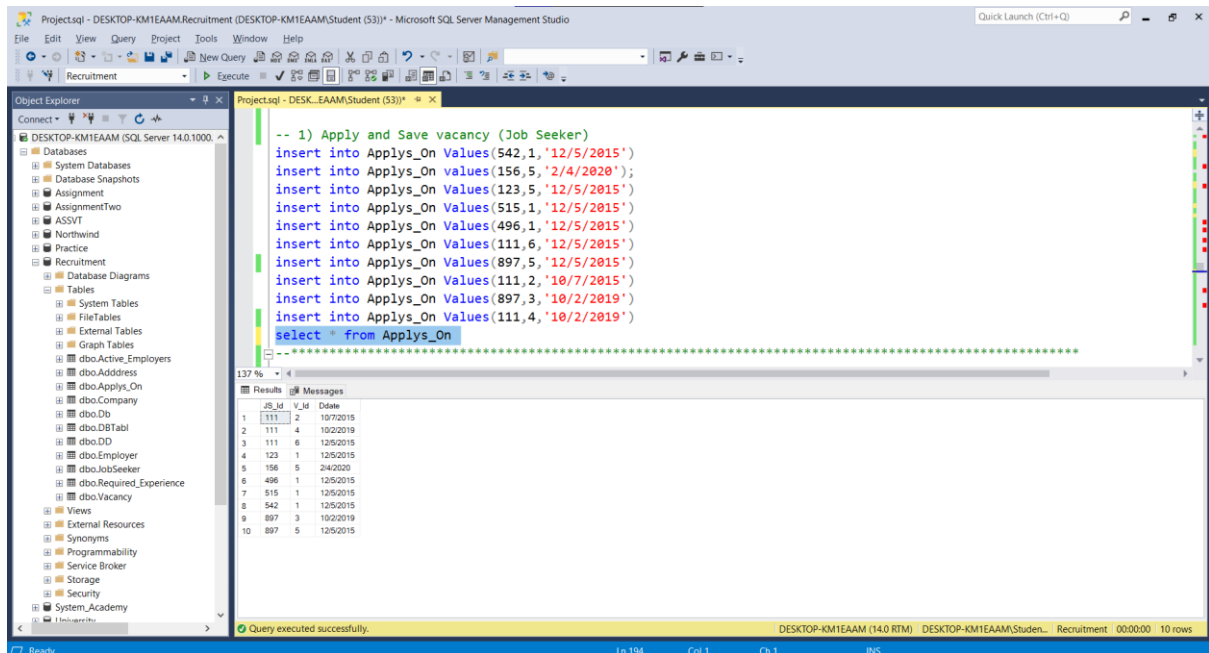
```
-- 3) Showing a list of job seekers that satisfy certain criteria (e.g. industry, location, experience...)
-- 1]
select *
from JobSeeker
where JobSeeker.Education='CS';
-- 2]
select *
from JobSeeker
where JobSeeker.Address=1;
-- 3]
select *
from JobSeeker
where JobSeeker.Experience=3;
```

The Results pane shows the output of the query, displaying a table with columns: FName, Mname, Lname, Sen, Gender, AGE, Military_Status, Education, Experience, and Address. The data is as follows:

FName	Mname	Lname	Sen	Gender	AGE	Military_Status	Education	Experience	Address	
1	essam	waliel	mohey	111	M	22	Done	CS	8	2
2	ahmed	yousef	mohamed	156	M	20	Done	CS	2	5
3	Kareem	hasan	mohamed	542	M	25	Done	CS	3	12

The status bar at the bottom indicates 'Query executed successfully' and 'DESKTOP-KM1EAAM (14.0 RTM) | DESKTOP-KM1EAAM/Studen... | Recruitment | 00:00:00 | 7 rows'.

9. Apply and save vacancy (job seeker):



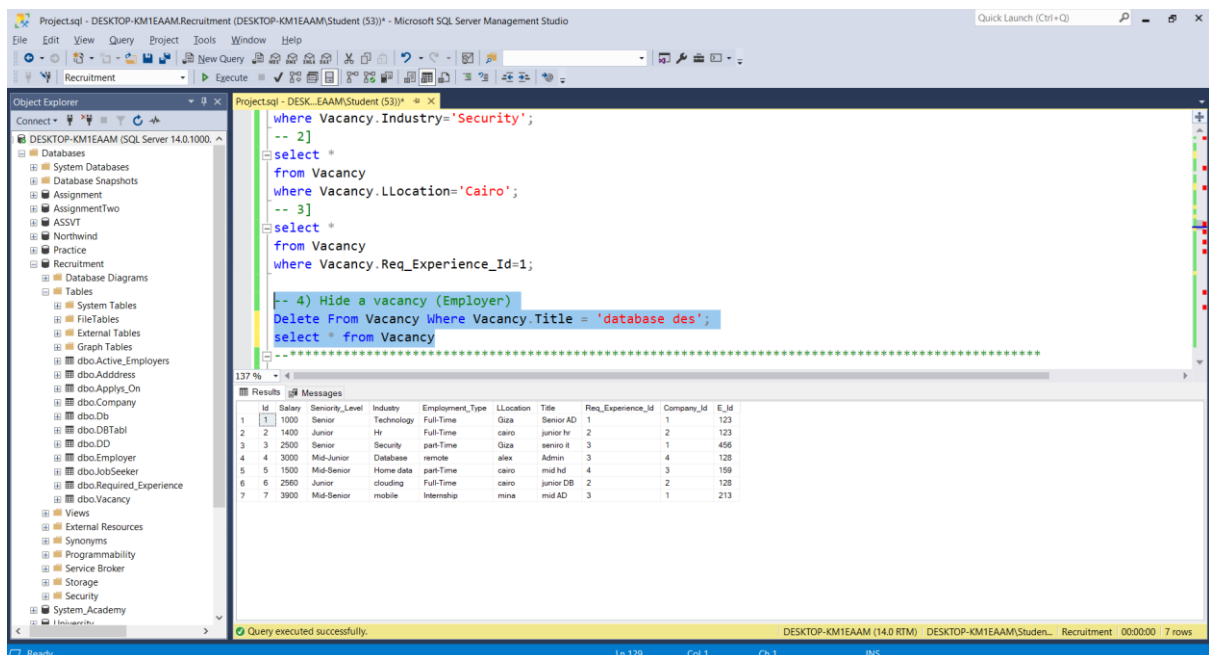
The screenshot shows the Microsoft SQL Server Enterprise Manager interface. The Object Explorer on the left displays the database structure for 'DESKTOP-KM1EAAM'. The central query window contains the following SQL script:

```
-- 1) Apply and Save vacancy (Job Seeker)
insert into Applies_On Values(542,1,'12/5/2015');
insert into Applies_On Values(156,5,'2/4/2020');
insert into Applies_On Values(123,5,'12/5/2015');
insert into Applies_On Values(515,1,'12/5/2015');
insert into Applies_On Values(496,1,'12/5/2015');
insert into Applies_On Values(111,6,'12/5/2015');
insert into Applies_On Values(897,5,'12/5/2015');
insert into Applies_On Values(111,2,'10/7/2015');
insert into Applies_On Values(897,3,'10/2/2019');
insert into Applies_On Values(111,4,'10/2/2019');
select * from Applies_On
```

The Results pane at the bottom shows the output of the query, displaying 10 rows of data from the Applies_On table:

	JS_Id	E_Id	Date
1	111	2	19/7/2015
2	111	4	10/2/2019
3	111	6	12/5/2015
4	123	1	12/5/2015
5	156	5	2/4/2020
6	496	1	12/5/2015
7	515	1	12/5/2015
8	542	1	12/5/2015
9	897	3	10/2/2019
10	897	5	12/5/2015

10. hide vacancy (employer):



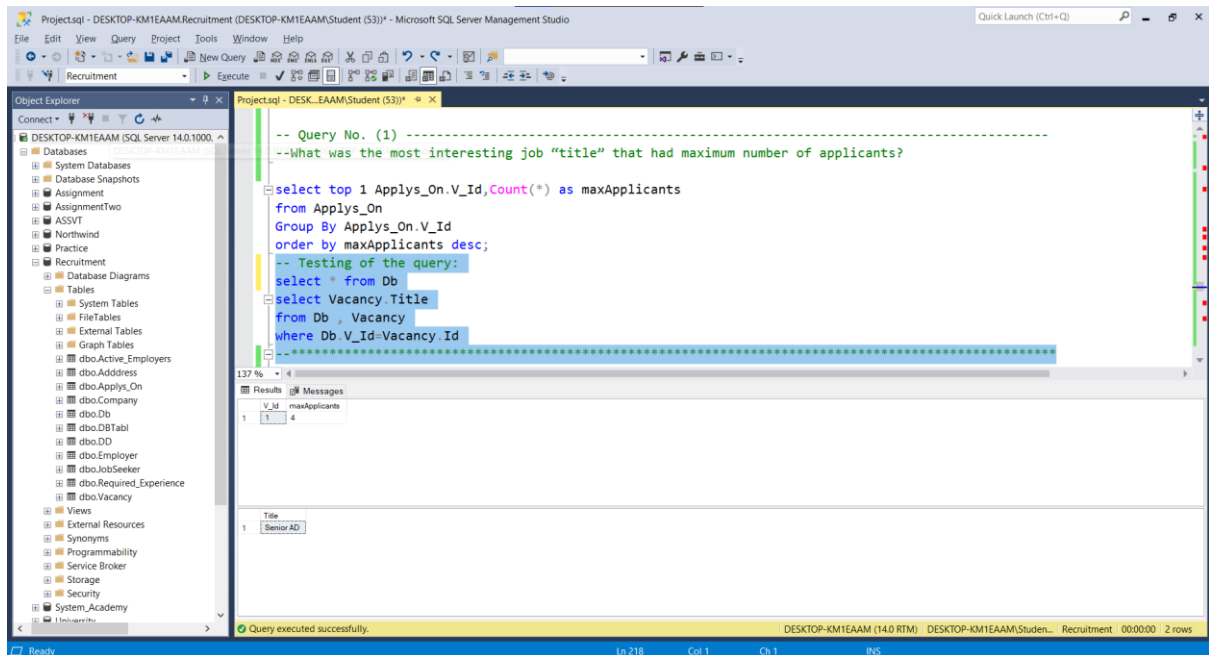
The screenshot shows the Microsoft SQL Server Enterprise Manager interface. The Object Explorer on the left displays the database structure for 'DESKTOP-KM1EAAM'. The central query window contains the following SQL script:

```
where Vacancy.Industry='Security';
-- 2]
select *
from Vacancy
where Vacancy.LLocation='Cairo';
-- 3]
select *
from Vacancy
where Vacancy.Req_Experience_Id=1;
-- 4) Hide a vacancy (Employer)
Delete From Vacancy Where Vacancy.Title = 'database des';
select * from Vacancy
```

The Results pane at the bottom shows the output of the query, displaying 7 rows of data from the Vacancy table:

	Id	Salary	Seniority_Level	Industry	Employment_Type	LLocation	Title	Req_Experience_Id	Company_Id	E_Id
1	1	1000	Senior	Technology	Full-Time	Giza	Senior AD	1	1	123
2	2	1400	Junior	HR	Full-Time	cairo	junior hr	2	2	123
3	3	2500	Senior	Security	part-Time	Giza	senior it	3	1	456
4	4	3000	Mid-Junior	Database	remote	alex	Admin	3	4	128
5	5	1500	Mid-Senior	Home data	part-Time	cairo	mid hd	4	3	159
6	6	2560	Junior	clouding	Full-Time	cairo	junior DB	2	2	128
7	7	3900	Mid-Senior	mobile	Internship	mina	mid AD	3	1	213

10. Query No. 1:



Project:sql - DESKTOP-KM1EAAM.Recruitment (DESKTOP-KM1EAAM\Student (S3)) - Microsoft SQL Server Management Studio

Object Explorer: DESKTOP-KM1EAAM (SQL Server 14.0.1000) > Databases > Recruitment > Tables > dbo.Vacancy

```
-- Query No. (1) -----  
--What was the most interesting job "title" that had maximum number of applicants?  
  
select top 1 Applies_On.V_Id,Count(*) as maxApplicants  
from Applies_On  
Group By Applies_On.V_Id  
order by maxApplicants desc;  
  
-- Testing of the query:  
select * from Db  
select Vacancy.Title  
from Db , Vacancy  
where Db.V_Id=Vacancy.Id
```

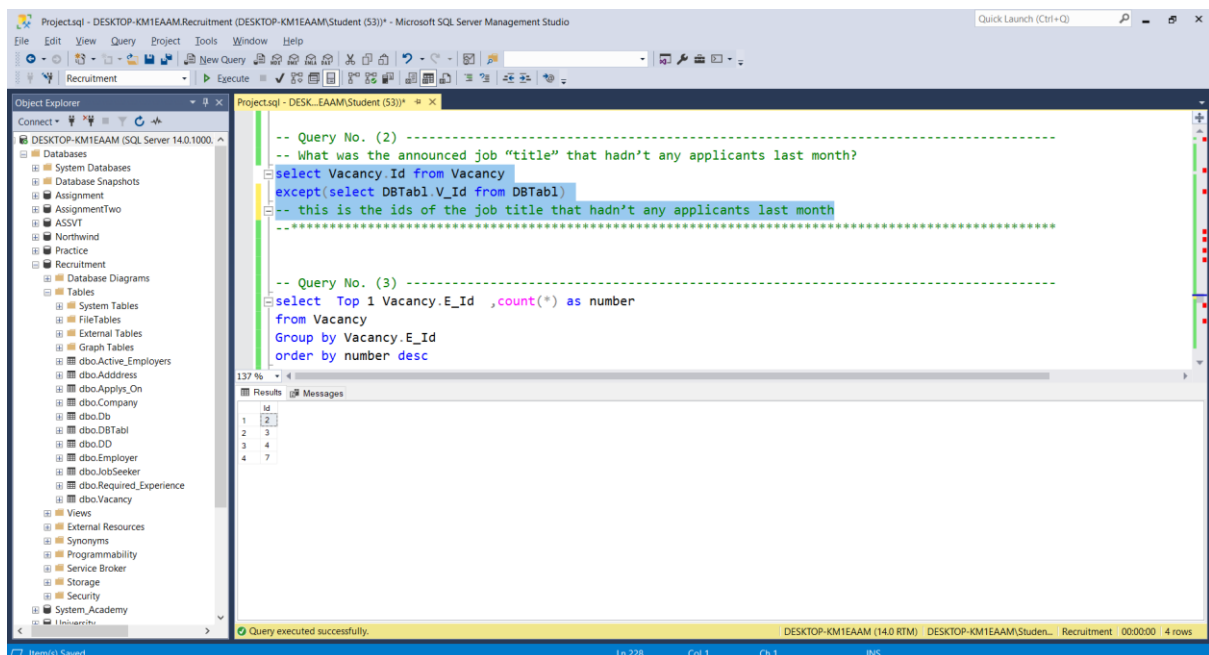
Results: 1 row(s) affected. Messages: 1 row(s) affected.

V_Id	maxApplicants
1	4

Title
Senior AD

Query executed successfully. DESKTOP-KM1EAAM (14.0 RTM) DESKTOP-KM1EAAM\Student... Recruitment 00:00:00 2 rows

11. Query No. 2:



Project:sql - DESKTOP-KM1EAAM.Recruitment (DESKTOP-KM1EAAM\Student (S3)) - Microsoft SQL Server Management Studio

Object Explorer: DESKTOP-KM1EAAM (SQL Server 14.0.1000) > Databases > Recruitment > Tables > dbo.Vacancy

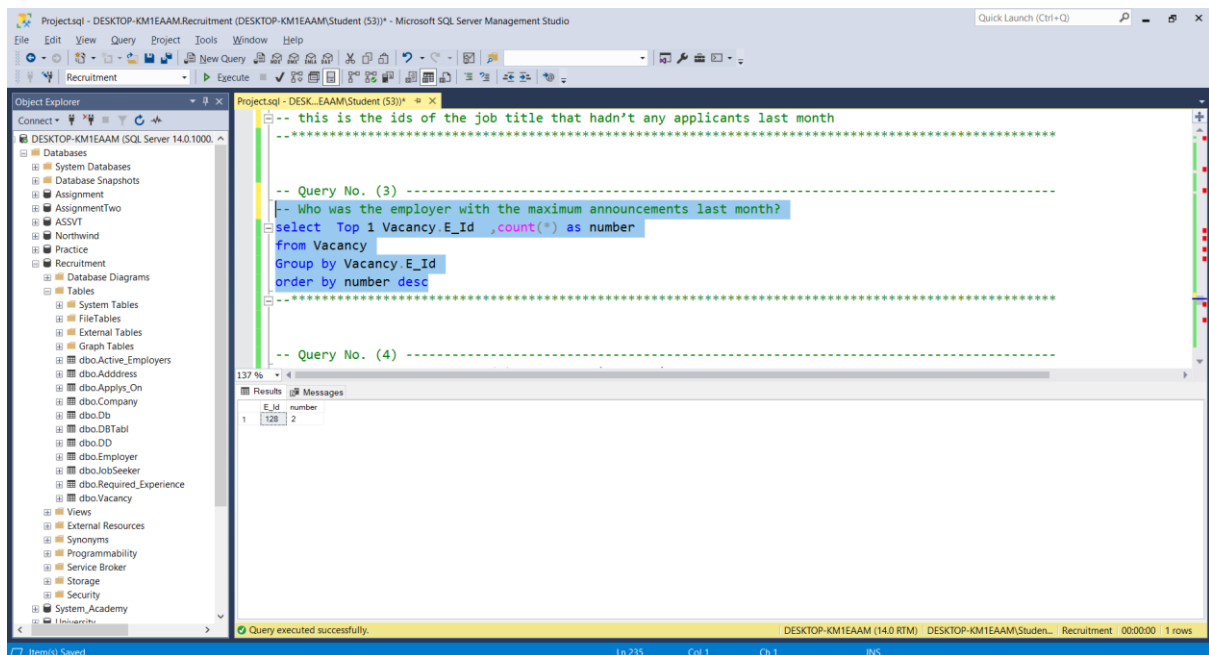
```
-- Query No. (2) -----  
-- What was the announced job "title" that hadn't any applicants last month?  
  
select Vacancy.Id from Vacancy  
except(select DBTabl.V_Id from DBTabl)  
-- this is the ids of the job title that hadn't any applicants last month  
  
-- Query No. (3) -----  
select Top 1 Vacancy.E_Id ,count(*) as number  
from Vacancy  
Group by Vacancy.E_Id  
order by number desc
```

Results: 4 row(s) affected. Messages: 1 row(s) affected.

Id
2
3
4
7

Query executed successfully. DESKTOP-KM1EAAM (14.0 RTM) DESKTOP-KM1EAAM\Student... Recruitment 00:00:00 4 rows

12. Query No. 3:



Project.sql - DESKTOP-KM1EAAM\Recruitment (DESKTOP-KM1EAAM\Student (S3)) - Microsoft SQL Server Management Studio

Object Explorer: DESKTOP-KM1EAAM (SQL Server 14.0.1000)

Query: -- this is the ids of the job title that hadn't any applicants last month

-- Query No. (3) -----
-- Who was the employer with the maximum announcements last month?
select Top 1 Vacancy.E_Id ,count(*) as number
from Vacancy
Group by Vacancy.E_Id
order by number desc

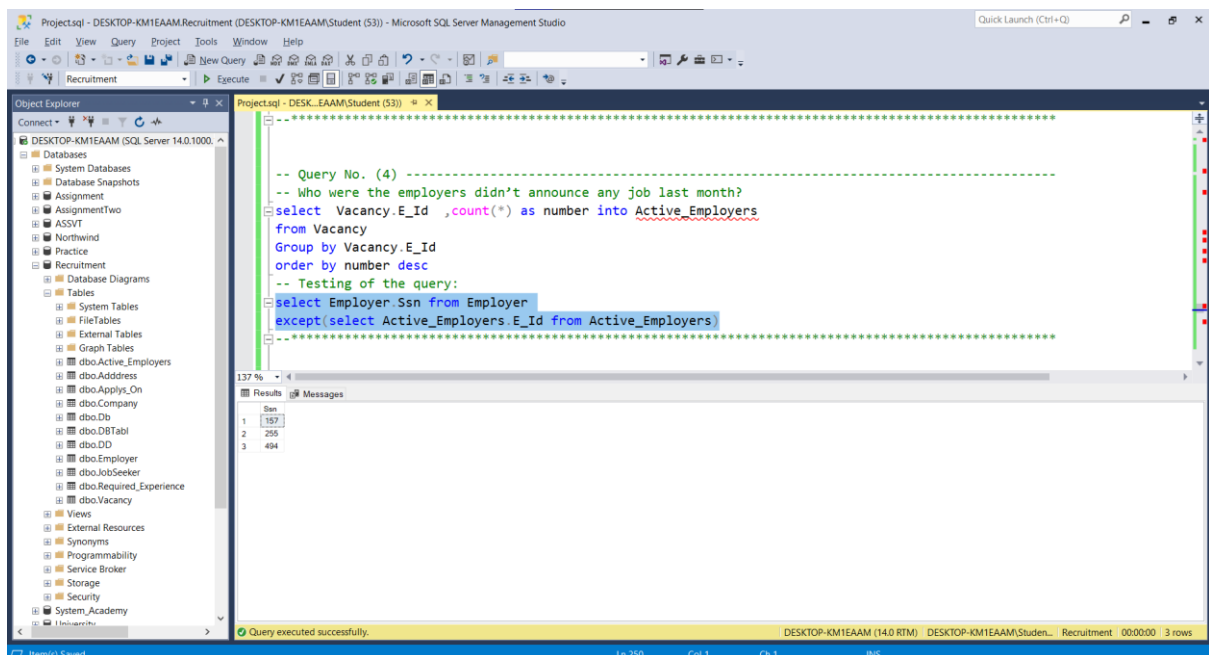
-- Query No. (4) -----

Results: Messages

E_Id	number
128	2

Query executed successfully. DESKTOP-KM1EAAM (14.0 RTM) DESKTOP-KM1EAAM\Student... Recruitment 00:00:00 1 rows

13. Query No. 4:



Project.sql - DESKTOP-KM1EAAM\Recruitment (DESKTOP-KM1EAAM\Student (S3)) - Microsoft SQL Server Management Studio

Object Explorer: DESKTOP-KM1EAAM (SQL Server 14.0.1000)

Query: -- Query No. (4) -----
-- Who were the employers didn't announce any job last month?
select Vacancy.E_Id ,count(*) as number into Active_Employers
from Vacancy
Group by Vacancy.E_Id
order by number desc
-- Testing of the query:
select Employer.Ssn from Employer
except(select Active_Employers.E_Id from Active_Employers)

Results: Messages

Ssn
157
256
494

Query executed successfully. DESKTOP-KM1EAAM (14.0 RTM) DESKTOP-KM1EAAM\Student... Recruitment 00:00:00 3 rows

14. Query No. 5:

Project:sql - DESKTOP-KM1EAAM.Recruitment (DESKTOP-KM1EAAM/Student (S3)) - Microsoft SQL Server Management Studio

```

select Employer.Ssn from Employer
except(select Active_Employers.E_Id from Active_Employers)
-----
-- Query No. (5) -----
-- What were the available positions at each employer last month?
select Vacancy.Id from Vacancy
except(select DBTabl.V_Id from DBTabl)
-- Testing of the query:
select Vacancy.Title,Vacancy.E_Id from Vacancy
where Vacancy.Id Not in(select DBTabl.V_Id from DBTabl)
-----

```

Results

Title	E_Id
junior hr	123
senior it	456
Admin	128
mid AD	213

Query executed successfully. DESKTOP-KM1EAAM (14.0 RTM) DESKTOP-KM1EAAM/Student... Recruitment 00:00:00 4 rows

15. Query No. 6:

Project:sql - DESKTOP-KM1EAAM.Recruitment (DESKTOP-KM1EAAM/Student (S3)) - Microsoft SQL Server Management Studio

```

-- Query No. (6) -----
-- For each seeker, retrieve all his/her information and the number of jobs he applied for
select Applies_On.JS_Id,Count(*) as no_of_jobs_applied into DD
from Applies_On
Group By Applies_On.JS_Id
-- Testing of the query:
select * from DD
select *
from (JobSeeker full outer join DD on JobSeeker.Ssn-DD.JS_Id)
-----

```

Results

JS_Id	no_of_jobs_applied
111	3
123	1
156	1
496	1
515	1
542	1
897	2

Query executed successfully. DESKTOP-KM1EAAM (14.0 RTM) DESKTOP-KM1EAAM/Student... Recruitment 00:00:00 15 rows

References

1. The Book: Fundamentals_of_Database_Systems_7th_edition.
2. The Lectures PDFs.