DATABASE MANAGEMENT PROJECT

Service providing and management system

GROUP 18

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INTRODUCTION

In today's world, health is of prime importance along with all other essential services which help us reduce our stress and workload. Labor comes at a very high value in some countries. Service repairs like RO Repair and refrigerator maintenance often cost a huge sum of money. We are designing a model which will provide all these services at your doorstep. We are designing a service management and service providing system which will make life easier and services cheaper. We like DoorDash, the revered food delivery application, provide options online to book the desired service according to the area code. Certain areas cost more, certain less.

We will be providing a detailed bill online pertaining to the different services chosen and will display the entire amount. The customer has the luxury to decline the service even then. The Customer will have constant monitoring via GPS of where his desired vendor has reached at any point in time. Customer can also choose the total experience of each vendor as we will display that to him while placing an order.

PHENOMENON

Service Provider – Home cleaning and appliances Repair.

INFORMATION SYSTEM

Provide service to the customers for home cleaning and appliance repair on demand based on the area code they reside in and assist them in booking appointment.

BUSINESS PROCESSES

We have enlisted three prime business processes along with many others. I will be explaining the three major business processes and activities in our project.

Business Process No.	Process Name	Activities	Description
1	Customer and Services Management	Activity 1	Maintain List of customers and services being provided
		Activity 2	Relate the services selected by the customer and provide recommendations based on it
2	Operations	Activity 1	Calculate Revenue monthly for a service and calculating the overall revenue
		Activity 2	Identify best employees based on ratings
3	Business Analysis	Activity 1	Sort the areas based on the number of appointments received from them and make necessary business

			decisions to work on area codes with less appointments
		Activity 2	Get the list of most popular services based on how many customers opted for a service in given month or year

Business Process 1 - Customer and Services Management

Here we will work on maintaining a database containing all the services and the list of all the customers who use our product. We would relate the services chosen by each customer frequently which will work as a market basket to enable us to provide us to provide useful recommendations.

Activity 1 – Maintain a list of customers and services chosen.

We will maintain a list of all the customers affiliated to our product.

Business / Functional Requirements – We must develop a list which keeps updating each time customer signs up for any service.

Data Requirements – We will require the name of the customer, age, date of appointment for each customer. We also need to maintain a database of all the services that we offer.

Activity 2 – Relate the services selected by the customer and provide recommendations based on it.

We will maintain a list of all the customers affiliated to our product. We will store the results in our database corresponding the service each customer has selected.

Business / Functional Requirements – We must develop a database of services availed by each customer in one table to help us provide recommendations accordingly.

Data Requirements – We will require the name of the customer, age, date of appointment for each customer. We will also require the services chosen by each customer.

Business Process 2 - Operations

Here we will work on how good or bad the business is doing both financially and service wise. We will classify the best of our employees and reward them for their hard work and skill and at the same time calculate the amount of revenue that we are generating monthly.

Activity 1 – Calculate Revenue monthly for a service and calculating the overall revenue

We will maintain a total revenue bill and with the help of queries calculate the revenue per month and the revenue overall till date. We will try and find out whether any seasonality in the revenue exists.

Business / Functional Requirements – Based on the price of each service we will calculate the total revenue generated by each service which will help us making operational decisions as in which services need more attention and employees.

Data Requirements – We will require the name of the total services provided per month. We also need to calculate the sum of revenue from each service monthly.

Activity 2 – Identify best employees based on ratings

Sincerity and dedication are two important virtues. It is necessary to reward these qualities righteously. We will reward our best rated employees, and this will also enable us to find out which employees will continue making us revenue throughout their tenure.

Business / Functional Requirements – Employee rating will help us analyze performance of each employee and take necessary actions regarding appraisal for best performers and extensive training for weak performers.

Data Requirements – We will require the ratings given by customers to every vendor and the number of times a particular vendor has been chosen.

Business Process 3 – Business Analysis

This will help our business grow. We will have detailed analysis regarding people from which area choose which services. We will also be getting a list of most popular services that are offered by our business. This will help us make strong strategic decisions to expand our business.

Activity 1 – Sort the areas based on the number of appointments.

We need to sort the services used most per area which will enable us to expand our business.

Business / Functional Requirements – Based on the number of appointments received from each area we will make necessary business decisions to work on area codes with less appointments.

Data Requirements – We will need to prepare a table which will indicate the count of appointments per service in an area.

Activity 2 – Identify most popular service

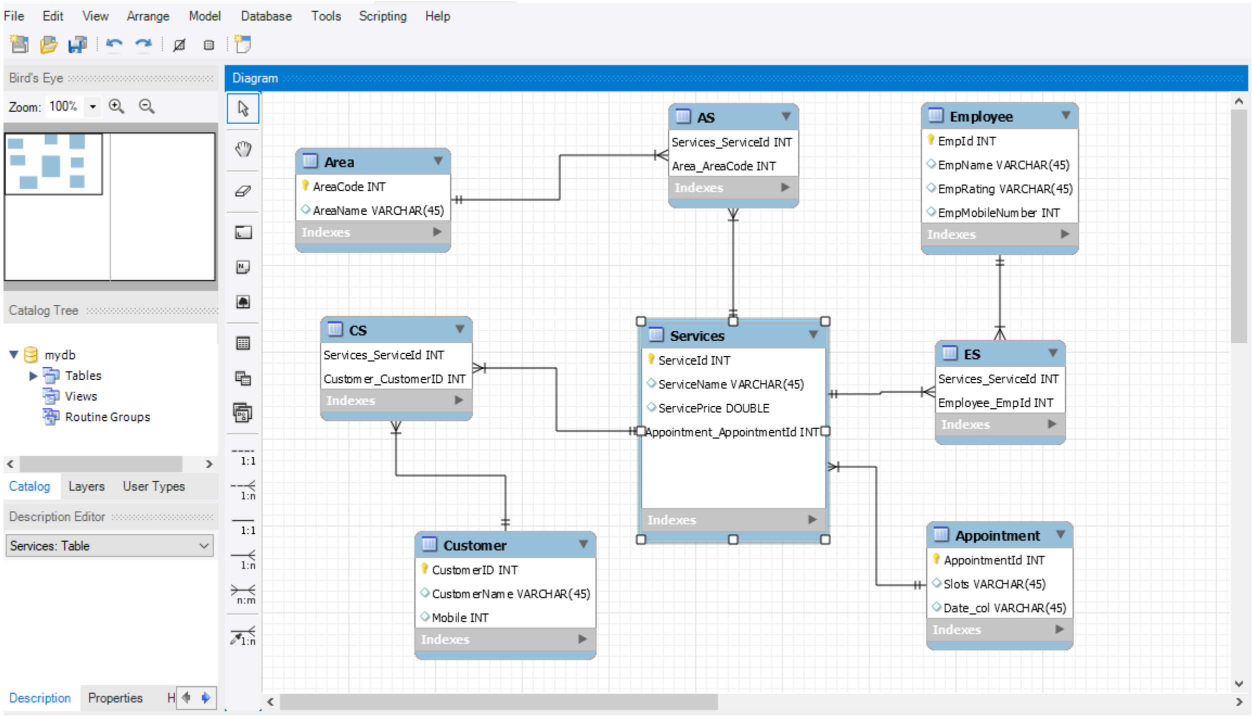
Here we will produce a list of most popular services based on how many customers opted for a service in given month or year.

Business / Functional Requirements – This will enable us to understand which are the services that the customers love. We will then try and provide these services at a cheaper rate to the areas where the business is generating a low revenue.

Data Requirements – We will need to sort our data on a monthly or yearly basis, to find out the count of number of appointments per service to predict the most popular one.

PART 2

THE ERD is as follows



- There is many to many relationship between Area and Service. One Area can have many services and any service can be available in many areas. To resolve this, we have associative entity type which is ‘aservice.’

- There is many to many relationship between Customers and Services. One service can be availed by many customers and one customer can avail many services. This is resolved with the help of associative entity type ‘cs’.

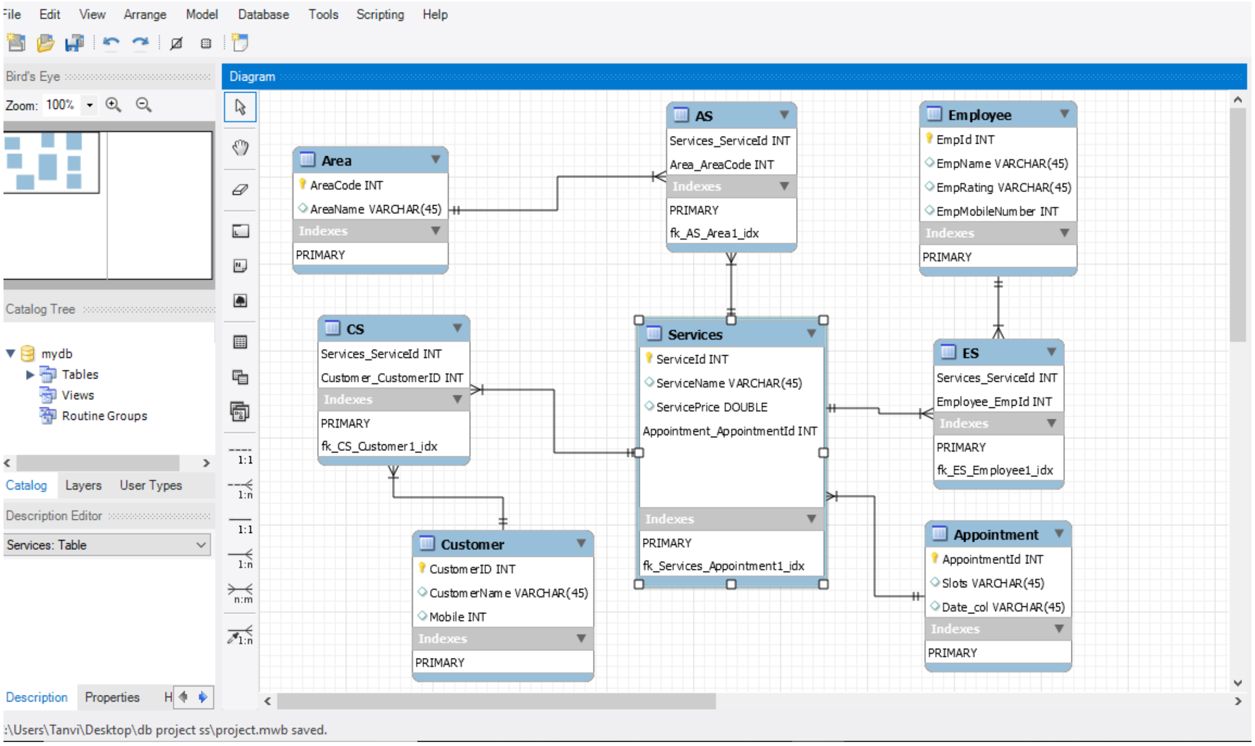
- There is one to many relationship from Services to Appointment. One Service can be assigned to many appointments however each appointment can be created only for one Service.

- There is many to many relationship from Service to Employees. One service can be assigned to many employees, but one employee can work for many services. This is resolved using the table ‘es’.

PART 3

No normalization is required for our database, as all the tables are already normalized. We have used auto incrementing primary keys (integers). Therefore, there will not be a problem of repeated rows.

The relationship diagram from the DBMS is as follows.



:\Users\Tanvi\Desktop\db project ss\project.mwb saved.

We have created a total of 8 tables

Five of which are representing the actual data requirements.

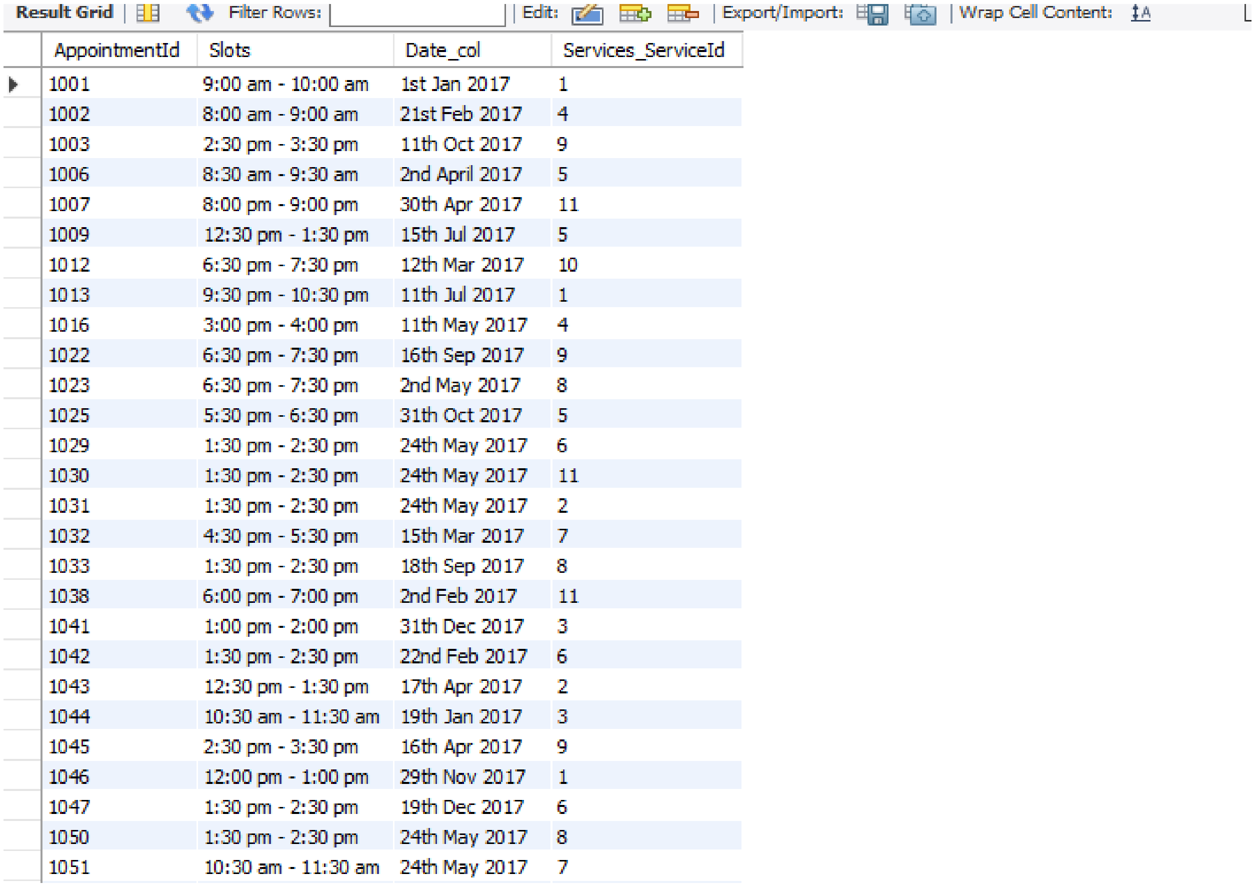
1. Appointment
2. Area
3. Customer
4. Employee
5. Services

The remaining three are produced to link certain tables with each other to maintain cardinality of each table as one to many.

1. Area and Services
2. Customer and Services
3. Employee and Services

Table 1

Appointment



AppointmentId	Slots	Date_col	Services_ServiceId
1001	9:00 am - 10:00 am	1st Jan 2017	1
1002	8:00 am - 9:00 am	21st Feb 2017	4
1003	2:30 pm - 3:30 pm	11th Oct 2017	9
1006	8:30 am - 9:30 am	2nd April 2017	5
1007	8:00 pm - 9:00 pm	30th Apr 2017	11
1009	12:30 pm - 1:30 pm	15th Jul 2017	5
1012	6:30 pm - 7:30 pm	12th Mar 2017	10
1013	9:30 pm - 10:30 pm	11th Jul 2017	1
1016	3:00 pm - 4:00 pm	11th May 2017	4
1022	6:30 pm - 7:30 pm	16th Sep 2017	9
1023	6:30 pm - 7:30 pm	2nd May 2017	8
1025	5:30 pm - 6:30 pm	31th Oct 2017	5
1029	1:30 pm - 2:30 pm	24th May 2017	6
1030	1:30 pm - 2:30 pm	24th May 2017	11
1031	1:30 pm - 2:30 pm	24th May 2017	2
1032	4:30 pm - 5:30 pm	15th Mar 2017	7
1033	1:30 pm - 2:30 pm	18th Sep 2017	8
1038	6:00 pm - 7:00 pm	2nd Feb 2017	11
1041	1:00 pm - 2:00 pm	31th Dec 2017	3
1042	1:30 pm - 2:30 pm	22nd Feb 2017	6
1043	12:30 pm - 1:30 pm	17th Apr 2017	2
1044	10:30 am - 11:30 am	19th Jan 2017	3
1045	2:30 pm - 3:30 pm	16th Apr 2017	9
1046	12:00 pm - 1:00 pm	29th Nov 2017	1
1047	1:30 pm - 2:30 pm	19th Dec 2017	6
1050	1:30 pm - 2:30 pm	24th May 2017	8
1051	10:30 am - 11:30 am	24th May 2017	7

Entity Type Name	Attributes	Description	Data Type	Information
appointment	AppointmentID	Number – Primary key	INT(11)	Keeps the appointment details by taking the slot information given by the customer and the date of booking. We provide one service per appointment.
	Slots	Total appointments	Varchar(45)	
	Date_col	Date of Appointment	Varchar(45)	
	Services_ServiceID	ID of the service chosen	INT	

Design View

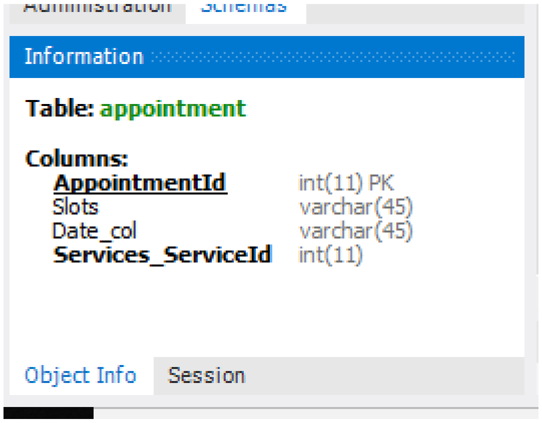


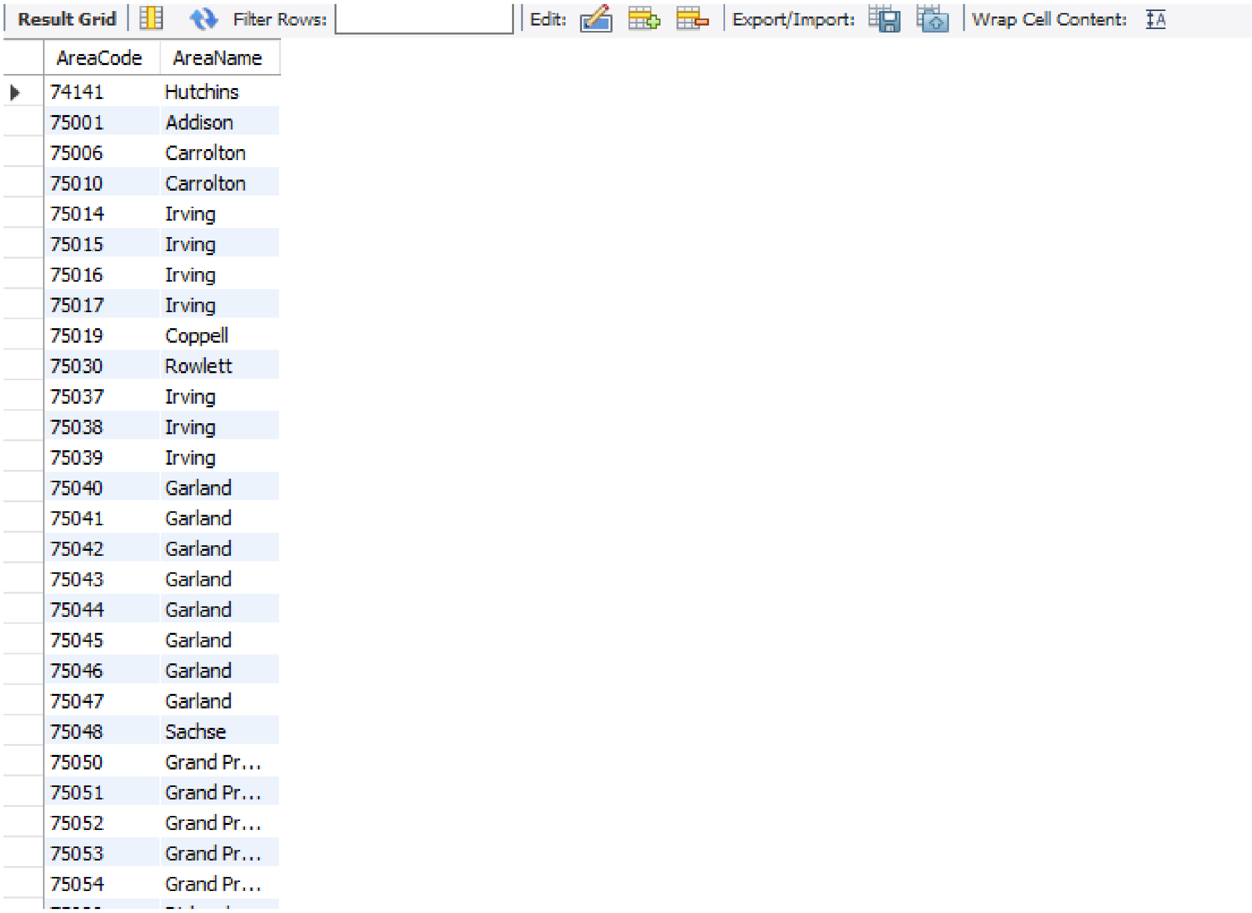
Table: appointment

Columns:

AppointmentId	int(11) PK
Slots	varchar(45)
Date_col	varchar(45)
Services_ServiceId	int(11)

Table 2

Area



AreaCode	AreaName
74141	Hutchins
75001	Addison
75006	Carrolton
75010	Carrolton
75014	Irving
75015	Irving
75016	Irving
75017	Irving
75019	Coppell
75030	Rowlett
75037	Irving
75038	Irving
75039	Irving
75040	Garland
75041	Garland
75042	Garland
75043	Garland
75044	Garland
75045	Garland
75046	Garland
75047	Garland
75048	Sachse
75050	Grand Pr...
75051	Grand Pr...
75052	Grand Pr...
75053	Grand Pr...
75054	Grand Pr...

Entity Type Name	Attributes	Description	Data Type	Information
Area	AreaCode	Areacode of area – Primary Key	INT	List of Area Codes in Dallas where the services are provided
	AreaName	We assign the name of area	Varchar(45)	

Design view

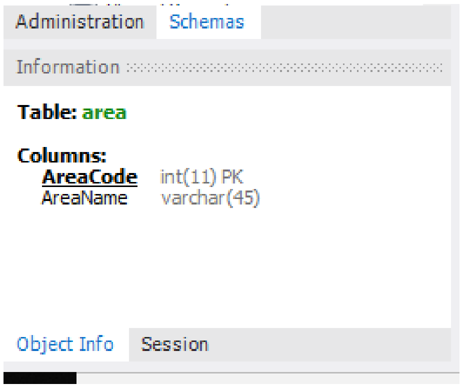


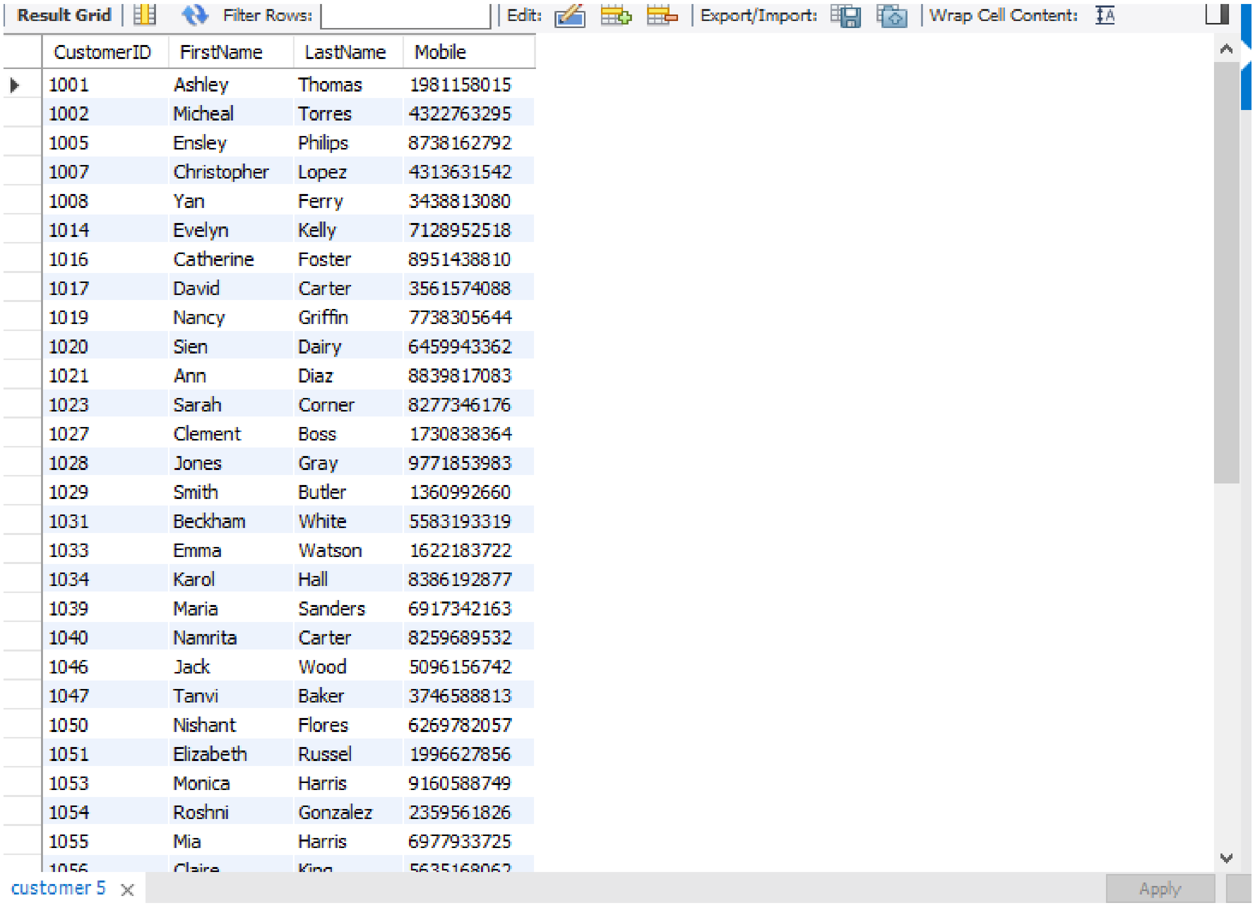
Table: area

Columns:

AreaCode	int(11) PK
AreaName	varchar(45)

Table 3

Customer



CustomerID	FirstName	LastName	Mobile
1001	Ashley	Thomas	1981158015
1002	Micheal	Torres	4322763295
1005	Ensley	Philips	8738162792
1007	Christopher	Lopez	4313631542
1008	Yan	Ferry	3438813080
1014	Evelyn	Kelly	7128952518
1016	Catherine	Foster	8951438810
1017	David	Carter	3561574088
1019	Nancy	Griffin	7738305644
1020	Sien	Dairy	6459943362
1021	Ann	Diaz	8839817083
1023	Sarah	Corner	8277346176
1027	Clement	Boss	1730838364
1028	Jones	Gray	9771853983
1029	Smith	Butler	1360992660
1031	Beckham	White	5583193319
1033	Emma	Watson	1622183722
1034	Karol	Hall	8386192877
1039	Maria	Sanders	6917342163
1040	Namrita	Carter	8259689532
1046	Jack	Wood	5096156742
1047	Tanvi	Baker	3746588813
1050	Nishant	Flores	6269782057
1051	Elizabeth	Russel	1996627856
1053	Monica	Harris	9160588749
1054	Roshni	Gonzalez	2359561826
1055	Mia	Harris	6977933725
1056	Claire	King	5635168062

Entity Type Name	Attributes	Description	Data Type	Information
customer	CustomerID	Primary Key –a unique ID is automatically assigned per customer	INT (11)	Keeps a database of the customers who have booked an appointment through our system
	FirstName	First name of the customer	Varchar(45)	
	LastName	Last name of the customer	Varchar(45)	
	Mobile	Mobile number of the customer	Varchar(10)	

Design View

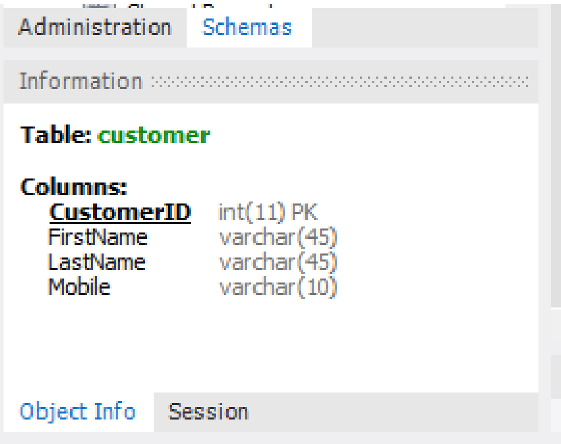


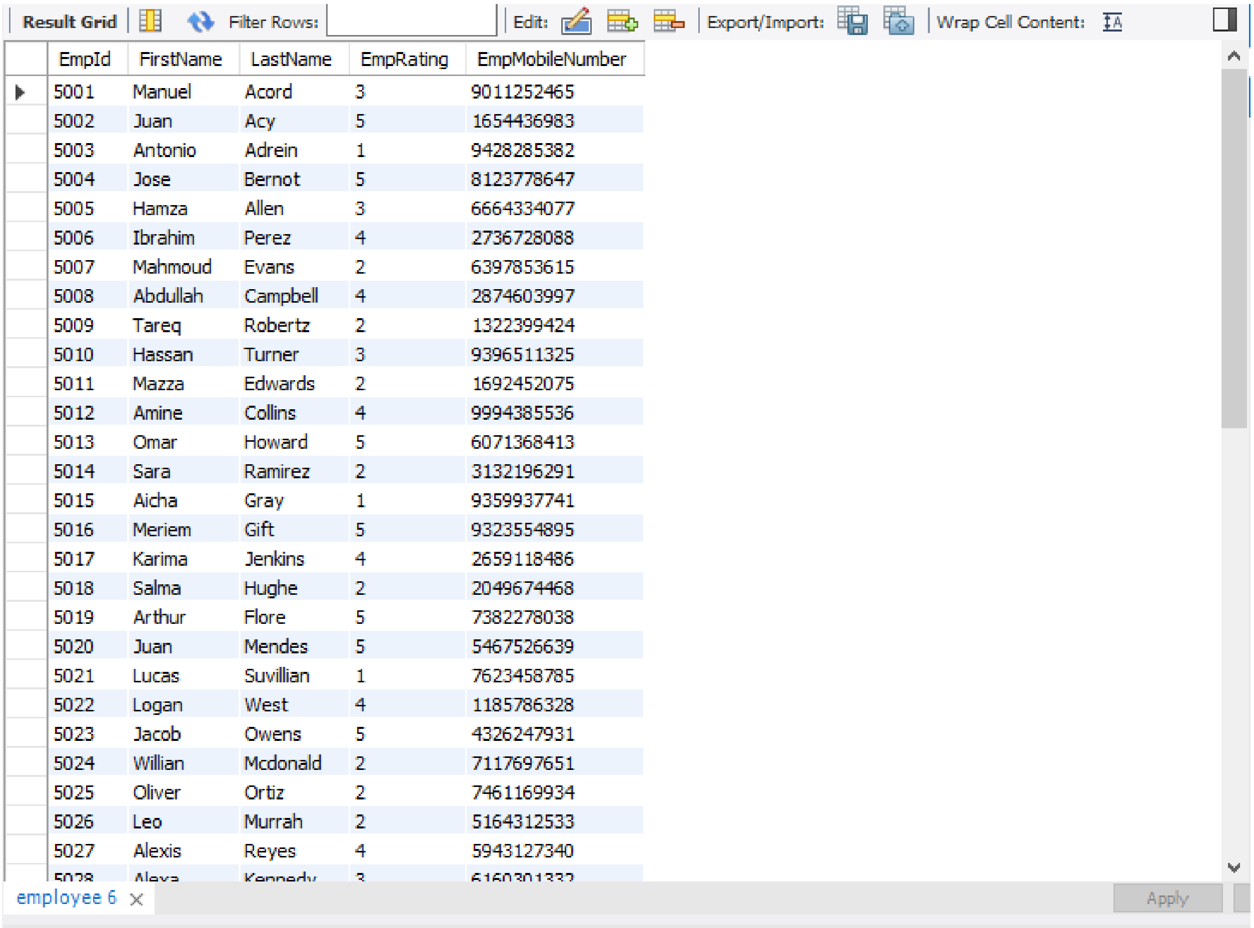
Table: customer

Columns:

CustomerID	int(11) PK
FirstName	varchar(45)
LastName	varchar(45)
Mobile	varchar(10)

Table 4

Employee



EmpId	FirstName	LastName	EmpRating	EmpMobileNumber
5001	Manuel	Acord	3	9011252465
5002	Juan	Acy	5	1654436983
5003	Antonio	Adrein	1	9428285382
5004	Jose	Bernot	5	8123778647
5005	Hamza	Allen	3	6664334077
5006	Ibrahim	Perez	4	2736728088
5007	Mahmoud	Evans	2	6397853615
5008	Abdullah	Campbell	4	2874603997
5009	Tareq	Robertz	2	1322399424
5010	Hassan	Turner	3	9396511325
5011	Mazza	Edwards	2	1692452075
5012	Amine	Collins	4	9994385536
5013	Omar	Howard	5	6071368413
5014	Sara	Ramirez	2	3132196291
5015	Aicha	Gray	1	9359937741
5016	Meriem	Gift	5	9323554895
5017	Karima	Jenkins	4	2659118486
5018	Salma	Hughe	2	2049674468
5019	Arthur	Flore	5	7382278038
5020	Juan	Mendes	5	5467526639
5021	Lucas	Suvillian	1	7623458785
5022	Logan	West	4	1185786328
5023	Jacob	Owens	5	4326247931
5024	Willian	Mcdonald	2	7117697651
5025	Oliver	Ortiz	2	7461169934
5026	Leo	Murrah	2	5164312533
5027	Alexis	Reyes	4	5943127340
5028	Alexa	Kennedy	3	6160301332

Entity Type Name	Attributes	Description	Data Type	Information
employee	EmpID	Primary Key –a unique ID is automatically assigned per employee	INT(11)	Maintains a list of all the employees working for the company
	FirstName	First name of the employee	Varchar(45)	
	LastName	Last name of the employee	Varchar(45)	
	EmpRating	How long has the employee been working for us	Float	
	EmpMobileNumber	Mobile number of the employee	INT	

Design View

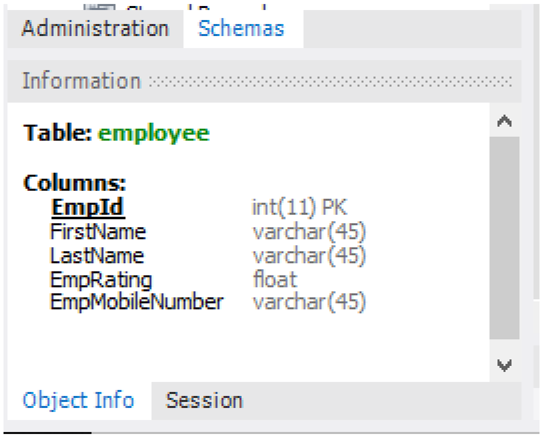


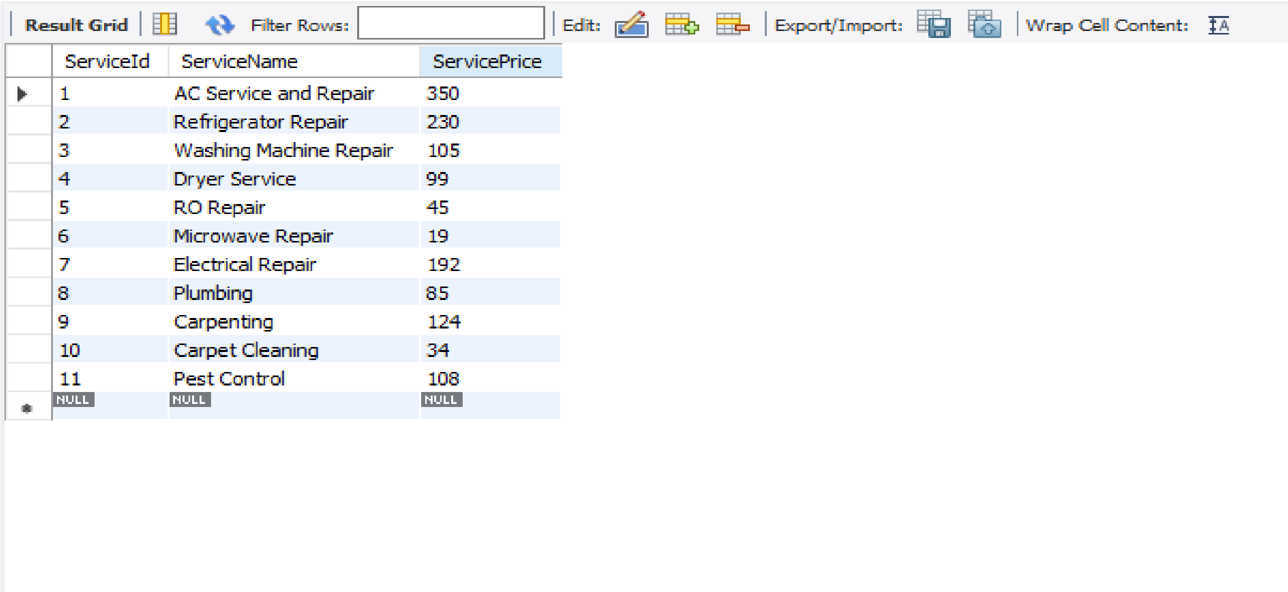
Table: employee

Columns:

```
  EmpId             int(11) PK
  FirstName         varchar(45)
  LastName          varchar(45)
  EmpRating         float
  EmpMobileNumber   varchar(45)
```

Table 5

Services



ServiceId	ServiceName	ServicePrice
1	AC Service and Repair	350
2	Refrigerator Repair	230
3	Washing Machine Repair	105
4	Dryer Service	99
5	RO Repair	45
6	Microwave Repair	19
7	Electrical Repair	192
8	Plumbing	85
9	Carpenting	124
10	Carpet Cleaning	34
11	Pest Control	108
NULL	NULL	NULL

Entity Type Name	Attributes	Description	Data Type	Information
Services	ServicesID	Primary Key –a unique ID is automatically assigned per service	INT	Total number of services that are being provided and their names
	ServiceName	Name of the Service offered	Varchar(45)	
	ServicePrice	Price of the service	Double	

Design View

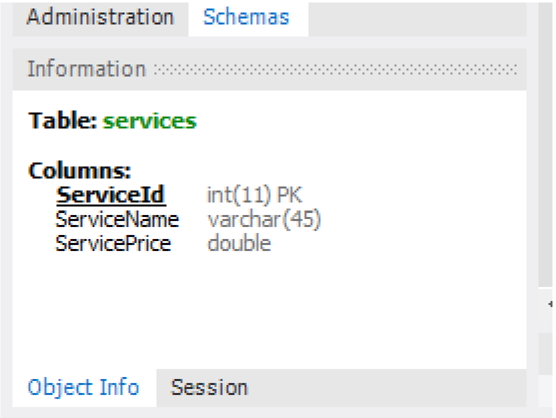


Table: services

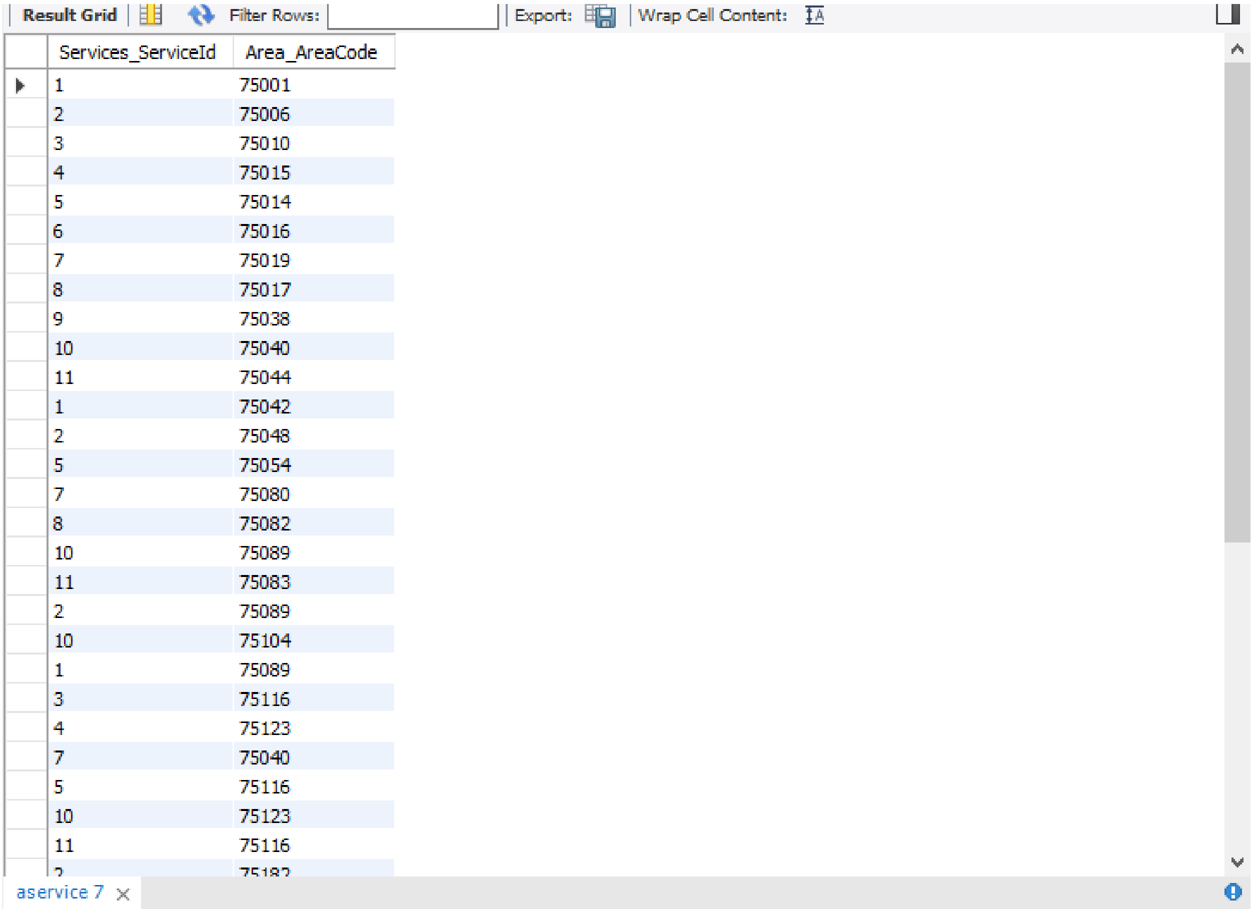
Columns:

ServiceId	int(11) PK
ServiceName	varchar(45)
ServicePrice	double

Tables that are used to keep the cardinality of each table as one to many are the following

Table 1

AService (Table between Area and Services)



Services_ServiceId	Area_AreaCode
1	75001
2	75006
3	75010
4	75015
5	75014
6	75016
7	75019
8	75017
9	75038
10	75040
11	75044
1	75042
2	75048
5	75054
7	75080
8	75082
10	75089
11	75083
2	75089
10	75104
1	75089
3	75116
4	75123
7	75040
5	75116
10	75123
11	75116
2	75182

Entity Type Name	Attributes	Description	Data Type	Information
aservice	Services_ServiceID	Mapping ServiceID from Services table	INT	Gives the list of services provided in every area
	Area_AreaCode	Mapping AreaCode from Area table	INT	

Design View

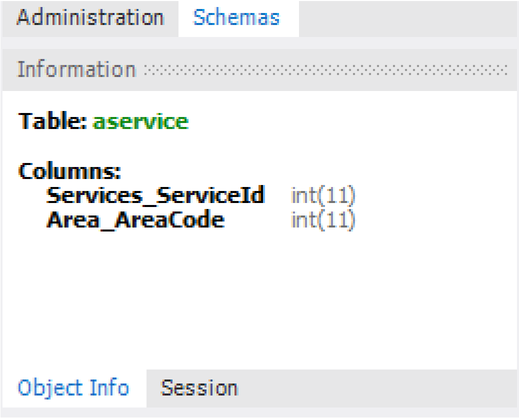


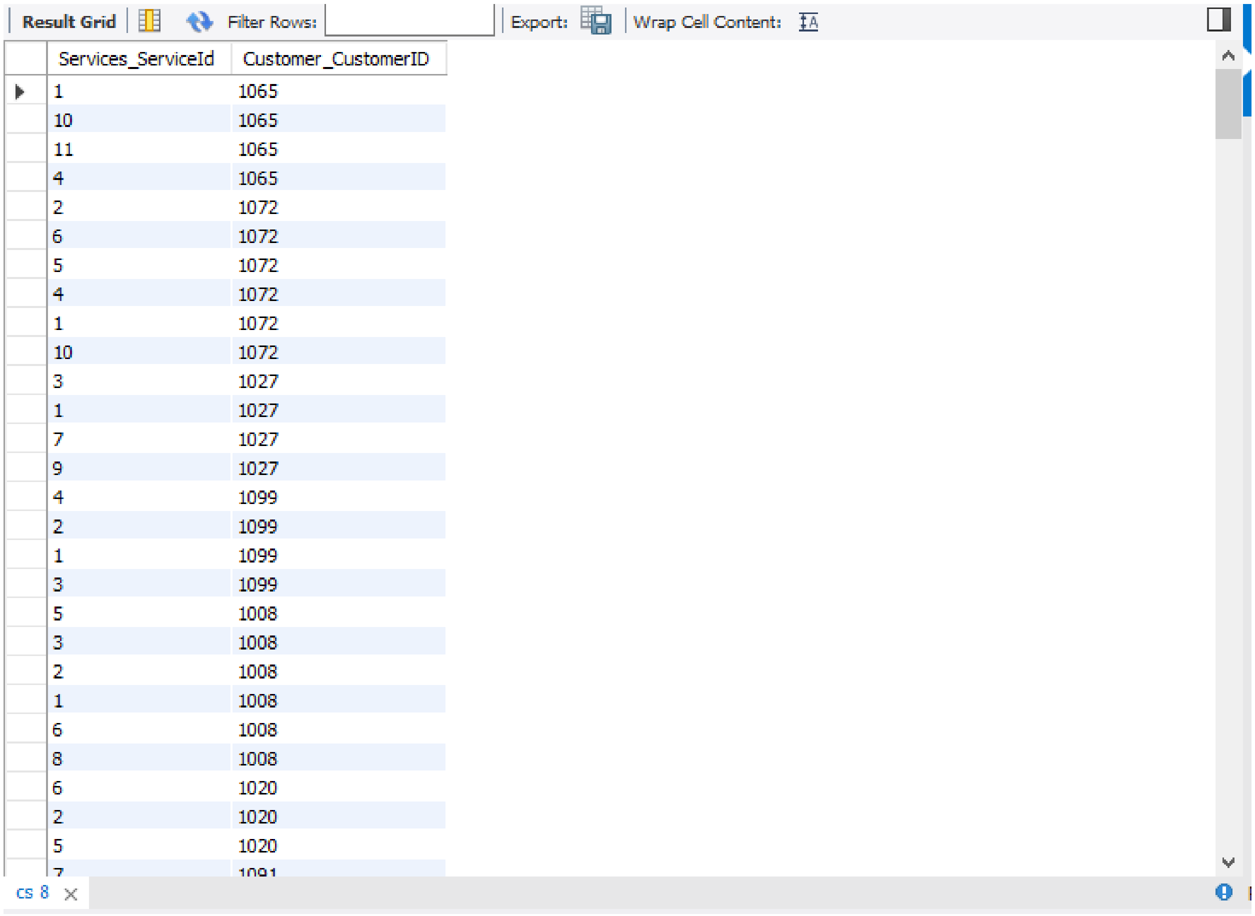
Table: aservice

Columns:

```
  Services_ServiceId   int(11)
  Area_AreaCode        int(11)
```

Table 2

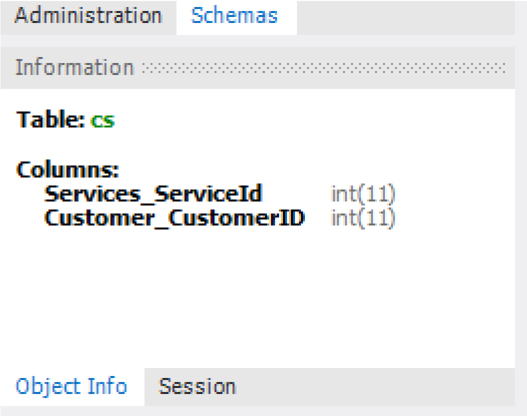
cs (Customer and Services)



Services_ServiceId	Customer_CustomerID
1	1065
10	1065
11	1065
4	1065
2	1072
6	1072
5	1072
4	1072
1	1072
10	1072
3	1027
1	1027
7	1027
9	1027
4	1099
2	1099
1	1099
3	1099
5	1008
3	1008
2	1008
1	1008
6	1008
8	1008
6	1020
2	1020
5	1020
7	1091

Entity Type Name	Attributes	Description	Data Type	Information
Cs	Services_ServicesID	Mapping ServiceID from Services table	INT	Keeps the information about services used by customers
	Customer_CustomerID	Mapping CustomerID from Customers table	INT	

Design View

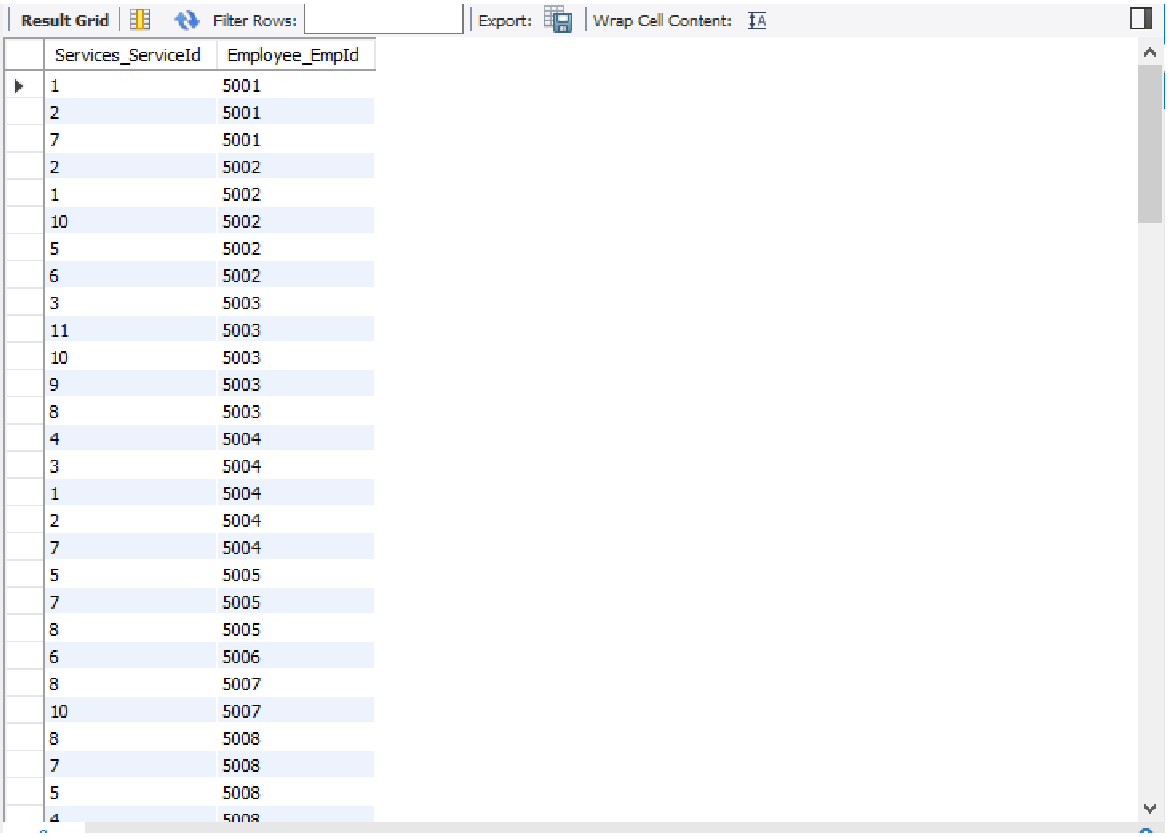


```
Table: cs

Columns:
   Services_ServiceId     int(11)
   Customer_CustomerID    int(11)
```

Table 3

ES (Employee and Services)



Services_ServiceId	Employee_EmpId
1	5001
2	5001
7	5001
2	5002
1	5002
10	5002
5	5002
6	5002
3	5003
11	5003
10	5003
9	5003
8	5003
4	5004
3	5004
1	5004
2	5004
7	5004
5	5005
7	5005
8	5005
6	5006
8	5007
10	5007
8	5008
7	5008
5	5008
4	5008

Entity Type Name	Attributes	Description	Data Type	Information
Es	Services_ServicesID	Mapping ServiceID from Services table	INT	Keeps the information about services offered by employees
	Employee_EmployeeID	Mapping EmployeeID from Employee table	INT	

Design View

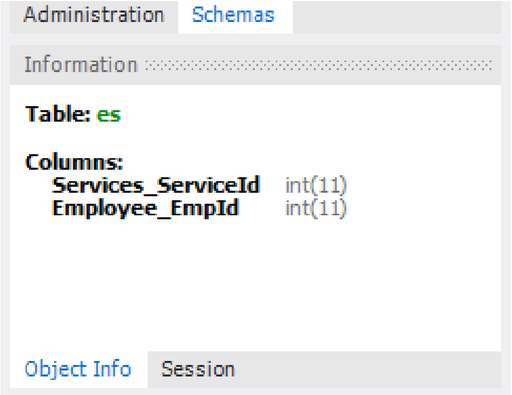


Table: es

Columns:

Services_ServiceId	int(11)
Employee_EmpId	int(11)

PART 4 - Queries

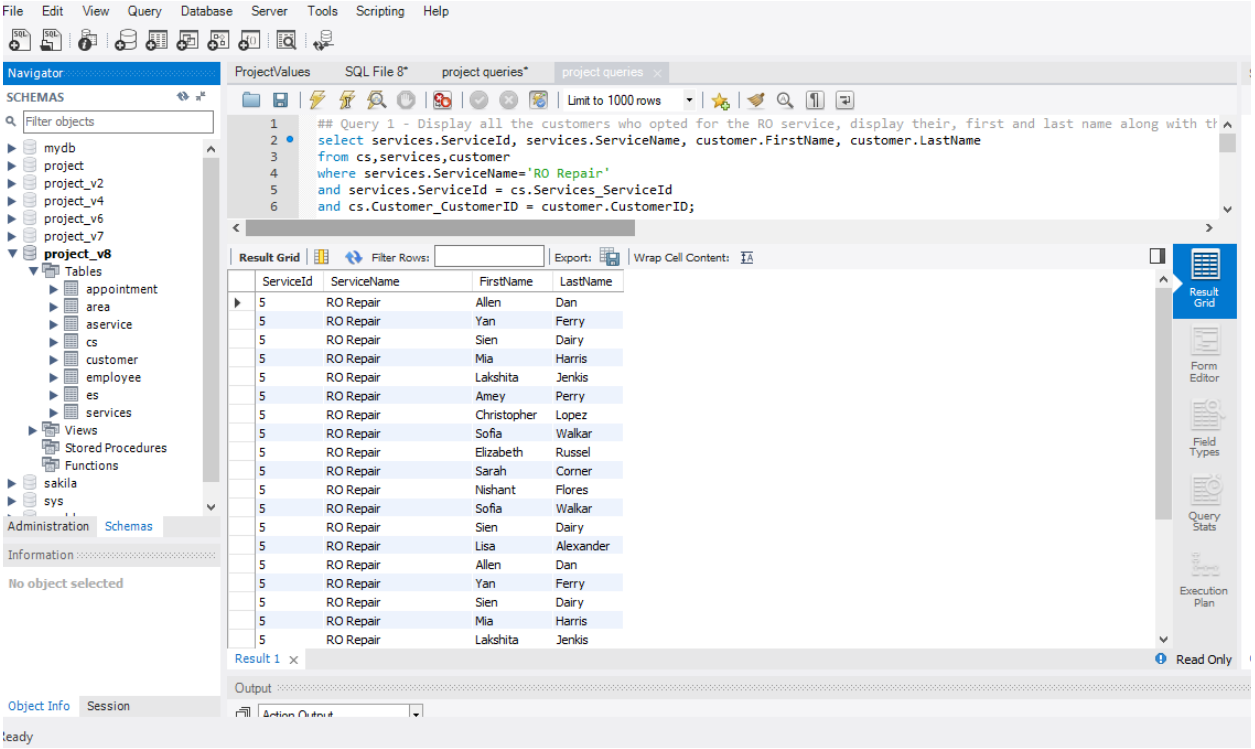
In accordance with our business processes we have designed the following queries.

Query 1

Translation – Here we are querying the data to find out customers who are using a particular service from among all the offered services. We are presenting the data containing columns as ServiceID, ServiceName, FirstName and LastName.

Example – Here we have considered customers availing only the 'RO Repair' Service.

Output produced after executing the query is as follows:



```sql
## Query 1 - Display all the customers who opted for the RO service, display their, first and last name along with th
select services.ServiceId, services.ServiceName, customer.FirstName, customer.LastName
from cs,services,customer
where services.ServiceName='RO Repair'
and services.ServiceId = cs.Services_ServiceId
and cs.Customer_CustomerID = customer.CustomerID;
```

ServiceId	ServiceName	FirstName	LastName
5	RO Repair	Allen	Dan
5	RO Repair	Yan	Ferry
5	RO Repair	Sien	Dairy
5	RO Repair	Mia	Harris
5	RO Repair	Lakshita	Jenkis
5	RO Repair	Amey	Perry
5	RO Repair	Christopher	Lopez
5	RO Repair	Sofia	Walkar
5	RO Repair	Elizabeth	Russel
5	RO Repair	Sarah	Corner
5	RO Repair	Nishant	Flores
5	RO Repair	Sofia	Walkar
5	RO Repair	Sien	Dairy
5	RO Repair	Lisa	Alexander
5	RO Repair	Allen	Dan
5	RO Repair	Yan	Ferry
5	RO Repair	Sien	Dairy
5	RO Repair	Mia	Harris
5	RO Repair	Lakshita	Jenkis

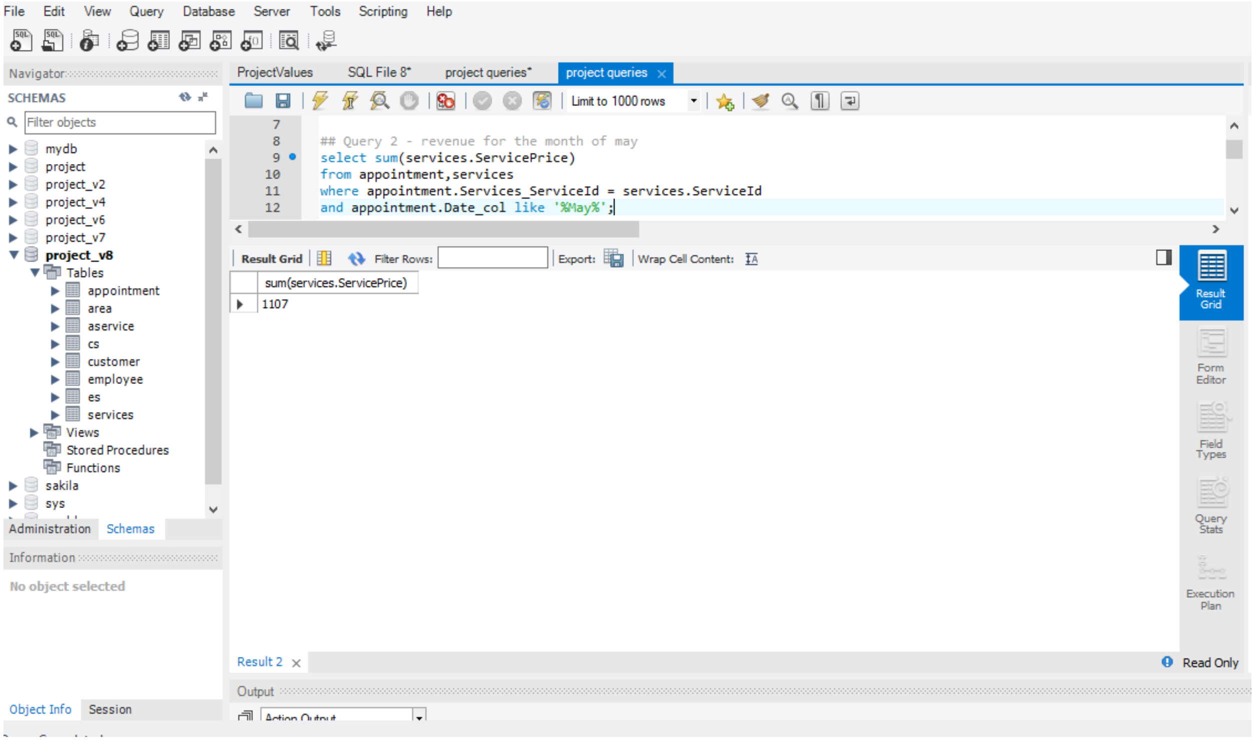
Queries in accordance with business process 2 - Operations

Query 2

Translation – Here we are calculating the total revenue in a month for all the services offered. This is in accordance with activity 1

Example – Here we are only calculating the total revenue for the month of May. We will be using the 'sum' aggregate funcion

Output generated after executing the query is as follows



```
## Query 2 - revenue for the month of may
select sum(services.ServicePrice)
from appointment,services
where appointment.Services_ServiceId = services.ServiceId
and appointment.Date_col like '%May%';
```

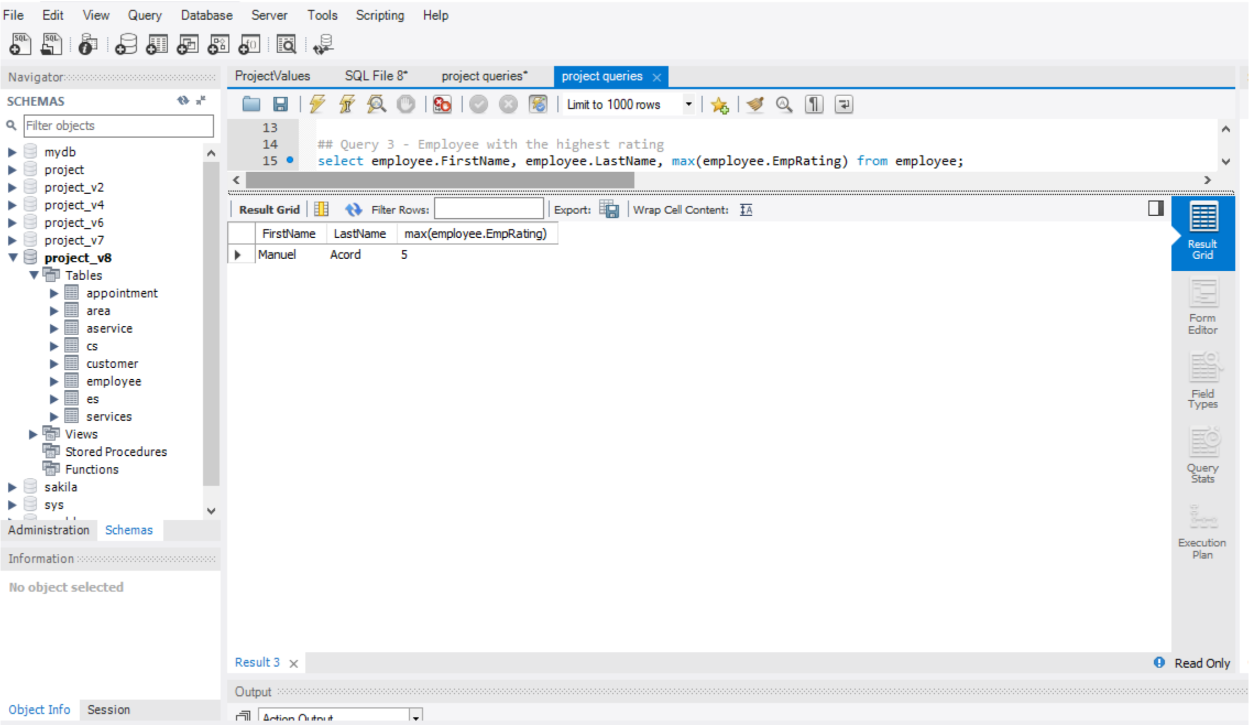
sum(services.ServicePrice)
1107

Query 3

Translation – Here we are querying the data to find the employee which has obtained the maximum rating amongst all the other employees.

Example – We will be finding out the maximum rating and appraising the employee. We will be using the ‘max’ aggregate function. This is a representation of the activity 2

The output generated after executing the query is as follows



```
## Query 3 - Employee with the highest rating
select employee.FirstName, employee.LastName, max(employee.EmpRating) from employee;
```

FirstName	LastName	max(employee.EmpRating)
Manuel	Acord	5

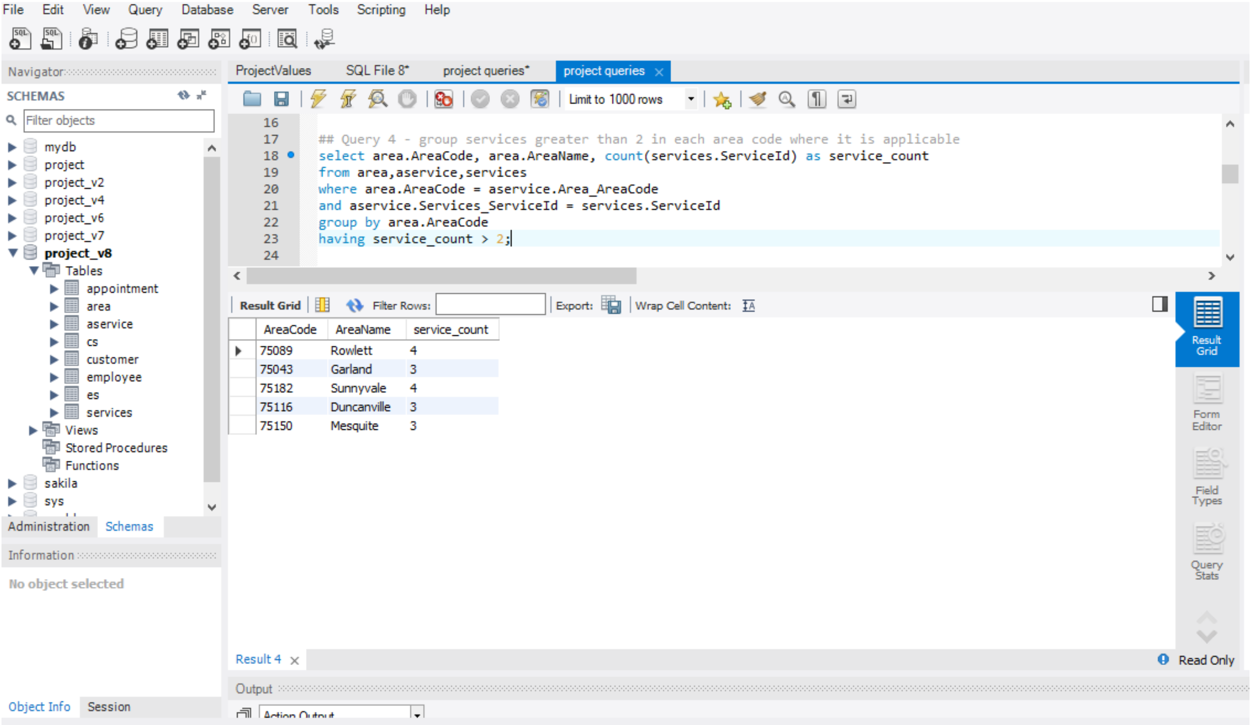
Queries in accordance with the Business Process 3 – Business Analysis

Query 4

Translation – Here we will find out the total number of appointments which are placed area wise. This will help us decipher as to which areas show popularity for a particular service.

Example – To decide the popularity we have only displayed count of appointments which are greater than 2 after using the group by function for Area.

The output generated after executing this query is as follows



```
## Query 4 - group services greater than 2 in each area code where it is applicable
select area.AreaCode, area.AreaName, count(services.ServiceId) as service_count
from area,aservice,services
where area.AreaCode = aservice.Area_AreaCode
and aservice.Services_ServiceId = services.ServiceId
group by area.AreaCode
having service_count > 2;
```

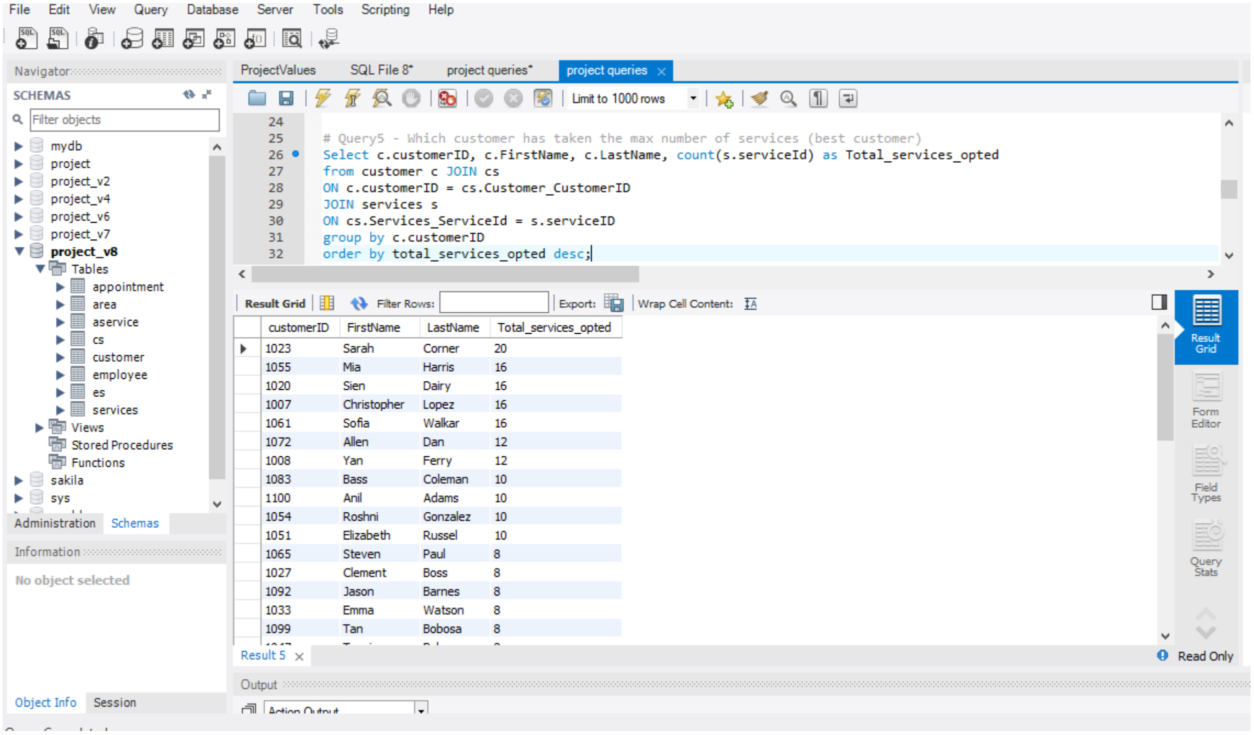
AreaCode	AreaName	service_count
75089	Rowlett	4
75043	Garland	3
75182	Sunnyvale	4
75116	Duncanville	3
75150	Mesquite	3

Query 5

Translation – We will find out our most frequent customers according to the number of appointments they have booked.

Example – We will sort the count of appointments in a descending order to find out our most popular customer. This will further help us to find out the service used most and which we can promote in areas which give us a low revenue.

Output generated after executing the query is as follows



```
# Query5 - Which customer has taken the max number of services (best customer)
Select c.customerID, c.FirstName, c.LastName, count(s.serviceId) as Total_services_opted
from customer c JOIN cs
ON c.customerID = cs.Customer_CustomerID
JOIN services s
ON cs.Services_ServiceId = s.serviceID
group by c.customerID
order by total_services_opted desc;
```

customerID	FirstName	LastName	Total_services_opted
1023	Sarah	Corner	20
1055	Mia	Harris	16
1020	Sien	Dairy	16
1007	Christopher	Lopez	16
1061	Sofia	Walkar	16
1072	Allen	Dan	12
1008	Yan	Ferry	12
1083	Bass	Coleman	10
1100	Anil	Adams	10
1054	Roshni	Gonzalez	10
1051	Elizabeth	Russel	10
1065	Steven	Paul	8
1027	Clement	Boss	8
1092	Jason	Barnes	8
1033	Emma	Watson	8
1099	Tan	Bobosa	8

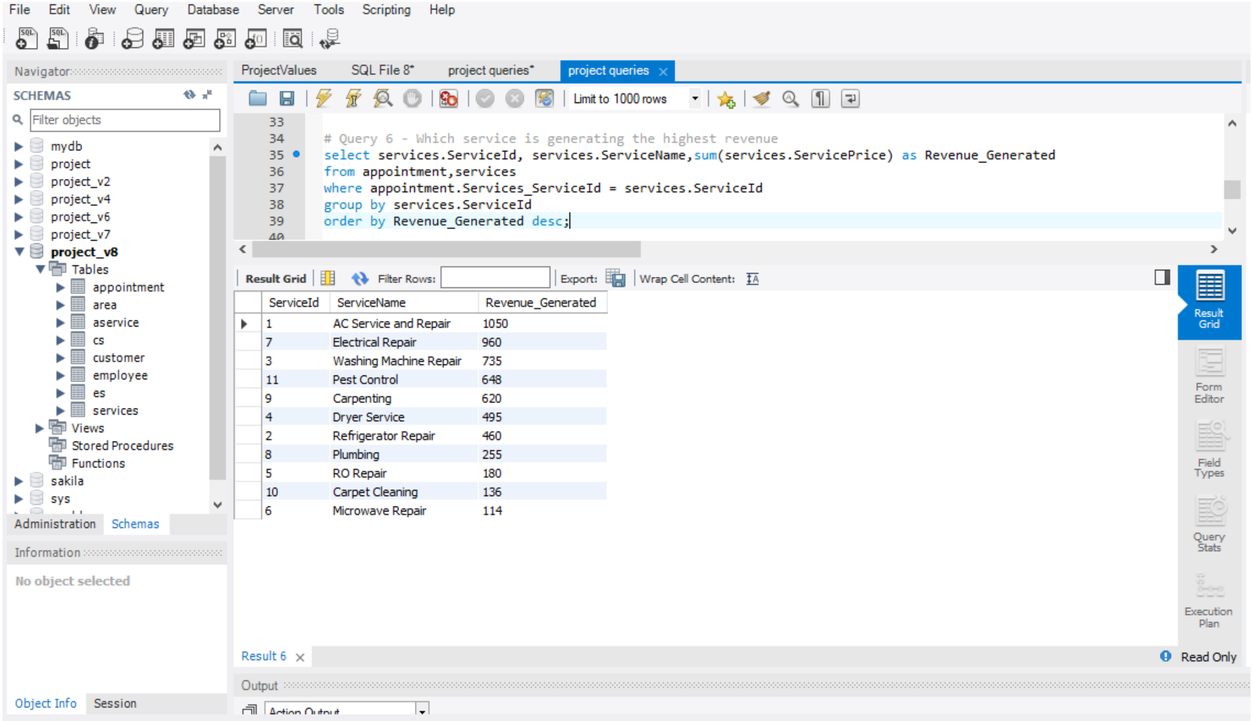
Queries in accordance with suggestions from the user group regarding this part of our report

Query 6

Translation – Only popularity of a service is not enough for the growth of a particular service. We will check the maximum revenue generated per service to find out which service is the most beneficial to us money wise.

Example – We will be using the aggregate function 'sum' and sort the revenue generated in a descending order per service.

Output generated after executing the query is as follows.



```
# Query 6 - Which service is generating the highest revenue
select services.ServiceId, services.ServiceName,sum(services.ServicePrice) as Revenue_Generated
from appointment,services
where appointment.Services_ServiceId = services.ServiceId
group by services.ServiceId
order by Revenue_Generated desc;
```

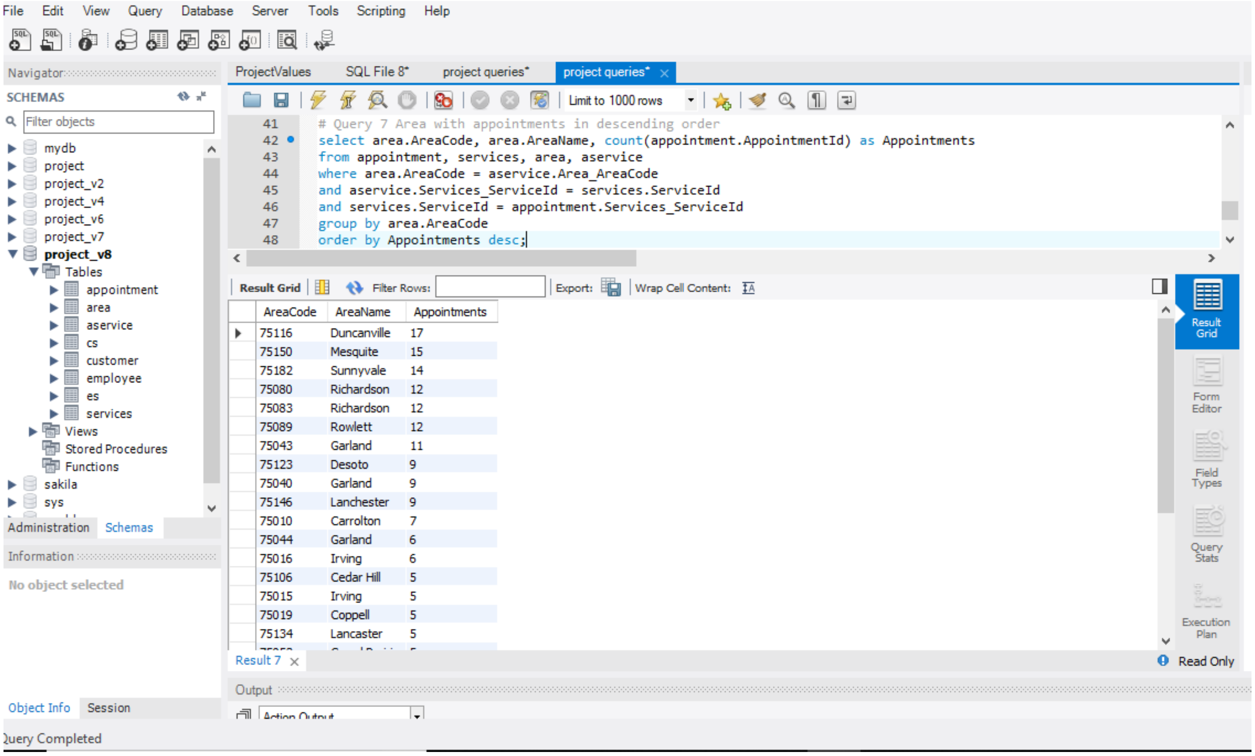
ServiceId	ServiceName	Revenue_Generated
1	AC Service and Repair	1050
7	Electrical Repair	960
3	Washing Machine Repair	735
11	Pest Control	648
9	Carpenting	620
4	Dryer Service	495
2	Refrigerator Repair	460
8	Plumbing	255
5	RO Repair	180
10	Carpet Cleaning	136
6	Microwave Repair	114

Query 7

Translation – Here we will calculate the maximum number of appointments per area which will help us to find out in what area is our business the most popular

Example – We will be using count aggregation and sorting it in a descending manner to find out our most popular area.

Output generated after executing the query is as follows.



```sql
# Query 7 Area with appointments in descending order
select area.AreaCode, area.AreaName, count(appointment.AppointmentId) as Appointments
from appointment, services, area, aservice
where area.AreaCode = aservice.Area_AreaCode
and aservice.Services_ServiceId = services.ServiceId
and services.ServiceId = appointment.Services_ServiceId
group by area.AreaCode
order by Appointments desc;
```

AreaCode	AreaName	Appointments
75116	Duncanville	17
75150	Mesquite	15
75182	Sunnyvale	14
75080	Richardson	12
75083	Richardson	12
75089	Rowlett	12
75043	Garland	11
75123	Desoto	9
75040	Garland	9
75146	Lanchester	9
75010	Carrolton	7
75044	Garland	6
75016	Irving	6
75106	Cedar Hill	5
75015	Irving	5
75019	Coppell	5
75134	Lancaster	5

Query Completed

Appendices

Journal detailing interactions with partner user group

We met our reviewer group several times regarding the project work. We also had a talk with our reviewer group regarding the data requirements and functional requirements.

Working together we learnt many different things and got a different outlook which was beneficial towards making our project a technically and professionally sound one.

Most significant outcomings of our interaction were as listed below.

1. We were asked to make the database more sound by using appropriate names for tables and entities.
2. Normalization was not a problem in our database, but they explained us as to why that problem does not exist in our database.
3. They gave excellent recommendations regarding the business processes that we must include, and which ones should we do away with.
4. They provided us with a different prospect regarding our business idea. They gave us tips to make our project look bigger and more realizable.
5. Coming to the reports, they put in efforts to enhance our presentation skills. They asked us to include page numbers and prepare a table of contents.
6. Only after thorough analysis, they gave us a heads up to upload the project on blackboard.

Recommendations provided by User group corresponding to different parts of the report

Part 1

Regarding the nomenclature of the tables in the database.

The user group provided us with certain insights regarding the nomenclature of the tables in our database. We were using vague names for tables at first. We were unsure as to what names would be suitable for the tables which had only used to set the cardinality from many to many to one to many.

Therefore, we changed the table names of the following tables

Appointment & Services → aservice

Customer & Services → cs

Employee & Services → es

This helped us a lot. This makes it easier for the person accessing the database for the first time easier to interpret the working of the database. Naming each table judiciously is important while developing a database.

Part 2

Regarding the cardinality of the entity relationship diagram.

We had initially designed an 'offering table' in order to map the primary keys as foreign keys. The user group asked us to use three different tables for mapping (aservice,es,cs). This enabled us to use the data easily. Querying results was no more difficult.

We decided to change the offering table into three different tables, 'es', 'cs' and 'aservice'. As a result, we could display the results to our business processes' queries properly.

Part 3

We were using primary keys not as auto incrementing integers but as user inputs. This increases the chances of same data being entered. An identical row is not what a database accepts readily, and it then becomes impossible to delete the row. The user group asked us to use auto-incrementing integers.

This was something which we should have thought of earlier. Due to autoincrementing primary keys each record is unique. It takes human error out of the picture. All discrepancies of data cease to exist.

Part 4

Initially we had designed only five queries. The user group came up with two more.

We executed those queries and the results obtained will surely help us to expand our business and making it even more profitable.

In reality, those queries suggested were like different business processes all together.