Group number: 56
Group member: Bofan Xue   (bofanx@andrew.cmu.edu)
              Kehuan Wang   (kehuanw@andrew.cmu.edu)

For specific questions, we give comments to explain our understanding of query, the definition of specific phrases, and help TA and the professor to have a better understanding of our sql statements.

PART A SCRIPT#1

```
DROP TABLE Employee CASCADE CONSTRAINTS;
DROP TABLE Faultreport CASCADE CONSTRAINTS;
DROP TABLE Outlet CASCADE CONSTRAINTS;
DROP TABLE Vehicle CASCADE CONSTRAINTS;
DROP TABLE Client CASCADE CONSTRAINTS;
DROP TABLE Ragreement CASCADE CONSTRAINTS;


CREATE TABLE Employee
(EmpNo NUMBER(4)
      CONSTRAINT Employee_EmpNo_PK PRIMARY KEY,
 Lname VARCHAR2(10),
 Fname VARCHAR2(10),
 Position VARCHAR2(15),
 Phone VARCHAR2(13)
      CONSTRAINT Employee_Phone_CK CHECK (REGEXP_LIKE(Phone, '^([0-9]{3}-[0-9]{4}-[0-9]{4})$')),
 Email VARCHAR2(30)
      CONSTRAINT Employee_Email_CK CHECK (Email LIKE '%_@carrental.com'),
 DOB DATE,
 Gender VARCHAR2(10),
      CONSTRAINT Employee_Gender_CK CHECK (Gender In ('Female', 'Male')),
 Salary NUMBER(8,2),
 HireDate DATE DEFAULT SYSDATE,
       CONSTRAINT Employee_AGE_CK CHECK ((HireDate - DOB)/365 > 14),
 OutNo NUMBER(3),
 SupervisorNo NUMBER(4)
      CONSTRAINT Employee_SupervisorNo_FK
      REFERENCES Employee (EmpNo)
);
```

```sql
CREATE TABLE Outlet
(OutNo NUMBER(3)
        CONSTRAINT Outlet_OutNo_PK PRIMARY KEY,
 Street VARCHAR2(20),
 City VARCHAR2(20),
 State CHAR(2),
        CONSTRAINT Outlet_State_CK CHECK (State In ('AL','AK','AZ','AR','CA','CO','CT','DE','FL','GA','HI','ID','IL','IN','IA',
                                                    'KS','KY','LA','ME','MD','MA','MI','MN','MS','MO','MT','NE','NV','NH','NJ',
                                                    'NM','NY','NC','ND','OH','OK','OR','PA','RL','SC','SD','TN','TX','UT','VT',
                                                    'VA','WA','WV','WI','WY')),
 ZipCode VARCHAR2(10),
 Phone VARCHAR2(13)
        CONSTRAINT Outlet_Phone_CK CHECK (REGEXP_LIKE(Phone, '^([0-9]{3}-[0-9]{4}-[0-9]{4})$')),
 ManagerNo NUMBER(4)
        CONSTRAINT Outlet_ManagerNo_FK
        REFERENCES Employee (EmpNo)
);


CREATE TABLE Vehicle
(LicenseNo NUMBER(5)
        CONSTRAINT Vehicle_LicenseNo_PK PRIMARY KEY,
 Make VARCHAR2(10),
 Model VARCHAR2(10),
 Color VARCHAR2(10),
 Year DATE
        CONSTRAINT Vehicle_Year_CK CHECK (2020-TO_CHAR(year, 'YYYY')<10),
 NoDoors VARCHAR2(10),
 Capacity VARCHAR2(6),
 DailyRate NUMBER(4,2),
 InspectionDate DATE,
 OutNo NUMBER(3)
        CONSTRAINT Vehicle_OutNo_FK
        REFERENCES Outlet (OutNo)
);
```

```sql
CREATE TABLE Client
(ClientNo NUMBER(5)
        CONSTRAINT Client_ClientNo_PK PRIMARY KEY,
 ClientName VARCHAR2(20),
 Street VARCHAR2(20),
 City VARCHAR2(15),
 State CHAR(2)
        CONSTRAINT Client_State_CK CHECK (State In ('AL','AK','AZ','AR','CA','CO','CT','DE','FL','GA','HI','ID','IL','IN','IA',
                                                    'KS','KY','LA','ME','MD','MA','MI','MN','MS','MO','MT','NE','NV','NH','NJ',
                                                    'NM','NY','NC','ND','OH','OK','OR','PA','RL','SC','SD','TN','TX','UT','VT',
                                                    'VA','WA','WV','WI','WY')),
 ZipCode CHAR(5),
 WebAddress VARCHAR2(80),
        CONSTRAINT Client_WebAddress_CK CHECK (WebAddress LIKE 'http%://%'),
 Contact_Fname VARCHAR2(12),
 Contact_Lname VARCHAR2(12),
 Phone VARCHAR2(13)
        CONSTRAINT Client_Phone_CK CHECK (REGEXP_LIKE(Phone, '^([0-9]{3}-[0-9]{4}-[0-9]{4})$')),
 Email VARCHAR2(28)
);


CREATE TABLE Ragreement
(RentalNo NUMBER(4)
        CONSTRAINT Ragreement_RentalNo_PK PRIMARY KEY,
 StartDate DATE,
 ReturnDate DATE,
 MileageBefore NUMBER(8,2),
 MileageAfter NUMBER(8,2),
         CONSTRAINT Ragreement_Mileage_CK CHECK(MileageAfter > MileageBefore),
 InsuranceType VARCHAR2(15),
 ClientNo NUMBER(5)
        CONSTRAINT Ragreement_ClientNo_FK
        REFERENCES Client (ClientNo),
 LicenseNo NUMBER(5)
```

```
        CONSTRAINT Ragreement_LicenseNo_FK
        REFERENCES Vehicle (LicenseNo)
);


CREATE TABLE Faultreport
(ReportNum NUMBER(4)
        CONSTRAINT Faultreport_ReportNum_PK PRIMARY KEY,
 DateChecked DATE,
 Comments VARCHAR2(50),
 EmpNo NUMBER(4)
        CONSTRAINT Faultreport_EmpNo_FK
        REFERENCES Employee (EmpNo),
 LicenseNo NUMBER(5)
        CONSTRAINT Faultreport_LicenseNo_FK
        REFERENCES Vehicle (LicenseNo),
 RentalNo NUMBER(4)
        CONSTRAINT Faultreport_RentalNo_FK
        REFERENCES Ragreement (RentalNo)
);

ALTER TABLE Employee
ADD CONSTRAINT Employee_OutNo_FK
        FOREIGN KEY (OutNo)
        REFERENCES Outlet (OutNo);
```

PART A SCRIPT#2

```
INSERT INTO outlet VALUES (901,'EAST SAVANNAH',  'ATLANTA',  'GA', '30314', '185-0456-1234', NULL);
INSERT INTO outlet VALUES (902,'TILA CIRCLE',    'CHICAGO',  'IL', '60605', '185-0456-1678', NULL);
INSERT INTO outlet VALUES (903,'MAGNOLIA LANE',  'EASTPOINT','FL', '32328', '185-0456-2364', NULL);
INSERT INTO outlet VALUES (904,'ROUNDABOUT WAY', 'TRENTON',  'NJ', '08601', '185-0456-5682', NULL);


INSERT INTO Employee VALUES (1025, 'Young',   'Cody',   'CEO'        , '135-6725-1345', 'Cody@carrental.com', '16-Apr-1988', 'Male' ,
20000, '31-Aug-2005', 901, NULL);
INSERT INTO employee VALUES (1004, 'Smith',   'Joe',    'IT',         '135-0393-1114', 'sj4@carrental.com',  '09-Mar-1977', 'Male',
17000, '12-Apr-2007', 904, 1025);
INSERT INTO employee VALUES (1008, 'SMITH',   'SAM',    'HR',         '135-0393-1118', 'ss8@carrental.com',  '28-May-1994', 'Male',
16000, '01-Nov-2015', 904, 1025);
INSERT INTO employee VALUES (1012, 'KZOCHSKY', 'TAMARA', 'Marketing',  '135-0393-1122', 'kt12@carrental.com', '28-May-1997', 'Female',
13000, '01-Jul-2018', 904, 1025);
INSERT INTO Employee VALUES (1016, 'Carter',  'Henry',  'Administive','135-0393-1126', 'ch16@carrental.com', '11-May-1994', 'Male',
26000, '01-Nov-2016', 904, 1025);
INSERT INTO Employee VALUES (1020, 'Whitestar','Mary',   'Advertiser', '135-0393-1130', 'wm20@carrental.com', '24-Mar-1997', 'Female',
11000, '25-Feb-2017', 904, 1025);
INSERT INTO Employee VALUES (1024, 'Milton',  'Kelly',  'Machinist',  '135-0393-1134', 'mk14@carrental.com', '16-Dec-1990', 'Female',
19000, '07-Dec-2012', 904, 1025);
INSERT INTO employee VALUES (1001, 'Codd',    'Jim',    'IT',         '135-0393-1111', 'cj1@carrental.com',  '17-May-1976', 'Male',
11000, '01-Oct-2004', 901, 1004);
INSERT INTO employee VALUES (1002, 'Chen',    'Peter',  'IT',         '135-0393-1112', 'cp2@carrental.com',  '28-Mar-1974', 'Male',
13000, '02-Dec-2005', 902, 1004);
INSERT INTO employee VALUES (1003, 'Miller',  'Adam',   'IT',         '135-0393-1113', 'ma1@carrental.com',  '08-Oct-1977', 'Male',
15000, '05-Apr-2007', 903, 1004);
INSERT INTO employee VALUES (1005, 'Hall',    'Steve',  'HR',         '135-0393-1115', 'hs5@carrental.com',  '14-Jul-1978', 'Male',
19000, '01-Jun-2007', 901, 1008);
INSERT INTO employee VALUES (1006, 'Jones',   'Carol',  'HR',         '135-0393-1116', 'jc6@carrental.com',  '11-Feb-1990', 'Male',
12000, '18-May-2012', 902, 1008);
INSERT INTO employee VALUES (1007, 'McCarthy','Chris',  'HR',         '135-0393-1117', 'mc7@carrental.com',  '11-Aug-1992', 'Male',
14000, '20-Oct-2013', 903, 1008);
INSERT INTO employee VALUES (1009, 'JONES',   'JANICE', 'Marketing',  '135-0393-1119', 'jj9@carrental.com',  '22-Jan-1993', 'Male',
18000, '12-Dec-2012', 901, 1012);
INSERT INTO employee VALUES (1010, 'AUSTIN',  'JAMES',  'Marketing',  '135-0393-1120', 'aj10@carrental.com', '12-May-1995', 'Male',
10000, '03-Aug-2015', 902, 1012);
INSERT INTO employee VALUES (1011, 'MARTINEZ', 'SHEILA', 'Marketing',  '135-0393-1121', 'ms11@carrental.com', '02-Feb-1995', 'Female',
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11000, '07-Jun-2014', 903, 1012);
INSERT INTO employee VALUES (1013, 'PORTER',   'LISA',    'Administive','135-0393-1123', 'ps13@carrental.com', '28-Mar-1993', 'Female',
15000, '18-Mar-2014', 901, 1016);
INSERT INTO employee VALUES (1014, 'FIELDS',   'OSCAR',   'Administive','135-0393-1124', 'fo14@carrental.com', '21-Sep-1996', 'Male',
17000, '01-Nov-2015', 902, 1016);
INSERT INTO employee VALUES (1015, 'WILKINSON','ANTHONY','Administive','135-0393-1125', 'wa15@carrental.com', '28-May-1994', 'Male',
19000, '01-Oct-2013', 903, 1016);
INSERT INTO Employee VALUES (1017, 'Bertram', 'Jill',    'Advertiser', '135-0393-1127', 'bj17@carrental.com', '06-Jul-1994', 'Male',
14000, '09-Jan-2016', 901, 1020);
INSERT INTO Employee VALUES (1018, 'Gates',   'Kate',    'Advertiser', '135-0393-1128', 'gb18@carrental.com', '26-Dec-1995', 'Female',
16000, '04-Jun-2017', 902, 1020);
INSERT INTO Employee VALUES (1019, 'Wheeler', 'Aria',    'Advertiser', '135-0393-1129', 'wh19@carrental.com', '11-Jun-1995', 'Female',
18000, '04-Jun-2016', 903, 1020);
INSERT INTO Employee VALUES (1021, 'Newton',  'Steve',   'Machinist',  '135-0393-1131', 'ns21@carrental.com', '29-Jan-1999', 'Male',
13000, '03-Jun-2018', 901, 1024);
INSERT INTO Employee VALUES (1022, 'Belli',   'Willam',  'Machinist',  '135-0393-1132', 'bw22@carrental.com', '28-May-1994', 'Male',
15000, '01-Nov-2017', 902, 1024);
INSERT INTO Employee VALUES (1023, 'Swift',   'Lisa',    'Machinist',  '135-0393-1133', 'sl23@carrental.com', '17-Feb-1991', 'Female',
17000, '21-Aug-2011', 903, 1024);


UPDATE Outlet SET ManagerNo = 1016 WHERE OutNo = 901;
UPDATE Outlet SET ManagerNo = 1016 WHERE OutNo = 902;
UPDATE Outlet SET ManagerNo = 1019 WHERE OutNo = 903;
UPDATE Outlet SET ManagerNo = 1009 WHERE OutNo = 904;

INSERT INTO vehicle VALUES (50001, 'Buick',      'Encore', 'black',  '13-Sep-2016', 'yes', '1200cc', 37, '16-Dec-2017', 901);
INSERT INTO vehicle VALUES (50002, 'Buick',      'Encore', 'black',  '01-Apr-2017', 'yes', '1200cc', 35, '09-Dec-2018', 902);
INSERT INTO vehicle VALUES (50003, 'Buick',      'Encore', 'black',  '16-Mar-2017', 'no',  '1200cc', 33, '27-Nov-2018', 903);
INSERT INTO vehicle VALUES (50004, 'Buick',      'Encore', 'black',  '10-Jan-2015', 'no',  '1200cc', 31, '19-Sep-2019', 904);
INSERT INTO vehicle VALUES (50005, 'Ford',       'F-150',  'white',  '21-May-2013', 'no',  '1200cc', 38, '31-Dec-2017', 901);
INSERT INTO vehicle VALUES (50006, 'Ford',       'F-150',  'white',  '11-Dec-2012', 'no',  '1200cc', 36, '06-Dec-2018', 902);
INSERT INTO vehicle VALUES (50007, 'Ford',       'F-150',  'white',  '07-Dec-2011', 'yes', '1200cc', 34, '16-Oct-2018', 903);
INSERT INTO vehicle VALUES (50008, 'Ford',       'F-150',  'white',  '23-Jul-2014', 'yes', '1200cc', 32, '11-Jun-2019', 904);
INSERT INTO vehicle VALUES (50009, 'Volkswagen', 'Polo',   'red',    '08-Dec-2016', 'yes', '1200cc', 37, '30-Nov-2017', 901);
INSERT INTO vehicle VALUES (50010, 'Volkswagen', 'Polo',   'red',    '01-Jan-2015', 'yes', '1200cc', 35, '19-May-2018', 902);
INSERT INTO vehicle VALUES (50011, 'Volkswagen', 'Polo',   'red',    '09-Jun-2013', 'no',  '1200cc', 33, '04-Oct-2018', 903);
INSERT INTO vehicle VALUES (50012, 'Volkswagen', 'Polo',   'red',    '27-Feb-2017', 'no',  '1200cc', 31, '26-Dec-2019', 904);
```

```
INSERT INTO vehicle VALUES (50013, 'Toyota',      'Corona', 'grey',  '04-Nov-2016', 'no',  '1200cc', 38, '01-Oct-2017', 901);
INSERT INTO vehicle VALUES (50014, 'Toyota',      'Corona', 'grey',  '29-Dec-2017', 'no',  '1200cc', 36, '31-Jan-2018', 902);
INSERT INTO vehicle VALUES (50015, 'Toyota',      'Corona', 'grey',  '31-Jan-2014', 'yes', '1200cc', 34, '19-Mar-2018', 903);
INSERT INTO vehicle VALUES (50016, 'Toyota',      'Corona', 'grey',  '16-Aug-2012', 'yes', '1200cc', 32, '16-May-2019', 904);
INSERT INTO vehicle VALUES (50017, 'Audi',        'A3',     'green', '03-Dec-2014', 'yes', '1200cc', 37, '19-Dec-2017', 901);
INSERT INTO vehicle VALUES (50018, 'Audi',        'A3',     'green', '12-Feb-2017', 'yes', '1200cc', 35, '08-Apr-2018', 902);
INSERT INTO vehicle VALUES (50019, 'Audi',        'A3',     'green', '09-Dec-2016', 'no',  '1200cc', 33, '29-Apr-2018', 903);
INSERT INTO vehicle VALUES (50020, 'Audi',        'A3',     'green', '18-Jan-2014', 'no',  '1200cc', 31, '19-Dec-2019', 904);
INSERT INTO vehicle VALUES (50021, 'BMW',         '3 Series', 'blue', '01-Jan-2012', 'no',  '1200cc', 38, '13-Dec-2017', 901);
INSERT INTO vehicle VALUES (50022, 'BMW',         '3 Series', 'blue', '17-Feb-2013', 'no',  '1200cc', 36, '06-Jul-2018', 902);
INSERT INTO vehicle VALUES (50023, 'BMW',         '3 Series', 'blue', '16-Jun-2014', 'yes', '1200cc', 34, '10-Aug-2018', 903);
INSERT INTO vehicle VALUES (50024, 'BMW',         '3 Series', 'blue', '26-Nov-2019', 'yes', '1200cc', 32, '13-Dec-2019', 904);


INSERT INTO Client VALUES(30001,'Smith Amelia','Venice
Blvd','Birmingham','AL','35201','http://www.SmithBlog.gov','Smith','Amelia','501-7554-8454','Smith@gmail.com');
INSERT INTO Client VALUES(30002,'Johnson Scott','Forest
Rd','Annapolis','MD','21401','http://www.ServerJohnson.net','Johnson','Scott','456-3141-1554','Johnson@geogle.com');
INSERT INTO Client VALUES(30003,'Williams Bill','River
St','Chicago','IL','60601','http://www.WilliamsBlog.gov','Williams','Bill','453-3425-3414','Williams@andrew.cmu.edu');
INSERT INTO Client VALUES(30004,'Jones Ana','Poplar
Ave','Columbus','OH','43085','http://www.JonesBiliBili.edu','Jones','Ana','341-3213-3173','JonesAna@gmail.com');
INSERT INTO Client VALUES(30005,'Brown Adam','State Ave','San
Diego','CA','92101','https://www.SmithBlog.org','Brown','Adam','455-3413-1243','Brown987@hotmail.com');
INSERT INTO Client VALUES(30006,'Davis Chris','Second Dr','San
Francisco','CA','94101','http://www.DavisCCCCCCC.com','Davis','Chris','451-3841-9834','Davislobe@gmail.com');
INSERT INTO Client VALUES(30007,'Miller Kelly','Valley
Blvd','Philidelphia','PA','19019','https://www.Million.net','Millionaire','Kelly','375-9351-8256','Million@gmail.com');
INSERT INTO Client VALUES(30008,'Wilson Jill','Meadow
St','Dallas','AR','71953','https://www.ThisIsMyBlog.com','Wilson','Jill','456-0184-0853','Wilson@gmail.com');
INSERT INTO Client VALUES(30009,'Moore Henry','Hillcrest
Ave','Fairbanks','AK','99701',NULL,'Moore','Henry','824-7245-7256','HenryMMMM@andrew.cmu.edu');
INSERT INTO Client VALUES(30010,'Taylor Mary','Cherry St','New
York','NY','10001','http://www.LoveTaylor.com','Taylor','Mary','164-3819-2384','TaylorMary@163.com');
INSERT INTO Client VALUES(30011,'Thomas Stan','Sycamore Ave','San
Jose','CA','95101','http://www.Tranining.gov','Thomas','Train','976-3141-1754','DuDuDu@gamil.com');
INSERT INTO Client VALUES(30012,'Jackson Jim','Spruce
Blvd','Omaha','NE','68046','http://www.SmithBlog.com','Jackson','Jim','456-3111-1554','JacksonJim@gmail.com');
INSERT INTO Client VALUES(30013,'Smith Scott','Maple
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Dr','Denver','CO','80002','http://www.SmithBlog-Real.edu','Smith','Scott','563-2059-0086','SmithScott@gmail.com');
INSERT INTO Client VALUES(30014,'White Chris','Elm St','Las
Vegas','NV','89101','https://www.WhiteHouse.com','Black','Mamba','602-9873-3047','BlackChris@usc.edu');
INSERT INTO Client VALUES(30015,'Harris Lisa','Manhaton
Ave','Honolulu','HI','96801','https://www.HarrisLisa.edu','Harris','Lisa','582-4827-0482','HarrisLisa@andrew.cmu.edu');
INSERT INTO Client VALUES(30016,'Martin Bob','Lakeview
Blvd','Jacksonville','FL','32099','https://www.Martinnnnnnn.com','Martin','Bob','582-9380-1857','MartinBob@usc.edu');
INSERT INTO Client VALUES(30017,'Thomson Steve','South Main St','Kansas
City','MO','64101','https://www.ThomsonTTTTT.org','Thomson','Steve','598-0382-3947','ThomsonSteve@gmail.com');
INSERT INTO Client VALUES(30018,'Garcia Willam','Venice
Blvd','Birmingham','AL','35201','https://www.Garcia.mil','Garcia','Willam','947-4817-1038','GGGWWW@hotmail.com');
INSERT INTO Client VALUES(30019,'Colin Young','North Main
St','Tampa','FL','33601','https://www.Colininging.gov','Colin','Young','102-9284-3049','Colin@gmail.com');
INSERT INTO Client VALUES(30020,'Martinez Swift','Hillcrest
Rd','Seattle','WA','98101','https://www.Martinez.com','Martinez','Young','947-5938-5972','Martinez@gmail.com');
INSERT INTO Client VALUES(30021,'Robinson Johnson','Laurel
Ave','Atlanta','GA','30301','http://www.ROBINSON.edu','Robinson','Johnson','930-8482-4918','RJ12345@gmail.com');
INSERT INTO Client VALUES(30022,'Clark Howard','Sycamore Ave','San
Diego','CA','92101',NULL,'Clark','Howard','294-9475-1742','Clark1998@hotmail.com');
INSERT INTO Client VALUES(30023,'Lewis Donald','Elm
St','Pittsburgh','PA','15122','http://www.Lewis.com','ROBERT','STARK','421-3451-7655','DonaldDonald@163.com');
INSERT INTO Client VALUES(30024,'Walker Hunk','Third
St','Buffalo','NY','14201','http://www.WalkerWalking.org','Walker','Hunk','642-3141-9754','WWWWWWWalk@gmail.com');
INSERT INTO Client VALUES(30025,'Ariana Green','Laurel
Ave','Atlanta','GA','30301','http://www.Ariana.com','Ariana','Green','642-3141-1111','Arianaaaaaaaa@gmail.com');
INSERT INTO Client VALUES(30026,'Kris Green','Laurel
Ave','Atlanta','GA','30301','http://www.Kris.mil','Kris','Green','642-3141-1111','Krisssssss@gmail.com');
INSERT INTO Client VALUES(30027,'Jane Green','Laurel
Ave','Atlanta','GA','30301','http://www.Jane.edu','Jane','Green','642-3141-1111','Janeeeeeeee@gmail.com');
INSERT INTO Client VALUES(30028,'Aria Blue','River
St','Chicago','IL','60601','http://www.Aria.com','Aria','Blue','642-3188-9999','Ariaaaaaaaa@gmail.com');
INSERT INTO Client VALUES(30029,'Amy Young','River
St','Chicago','IL','60601','http://www.AmyYoung.gov','Amy','Young','642-3188-7777','Ammmmmmyyyyy@gmail.com');
INSERT INTO Client VALUES(30030,'Karel Robert','North Main
St','Tampa','FL','32328','http://www.KarelR.edu','Karel','Robert','642-3441-4411','Karellllll@gmail.com');
INSERT INTO Client VALUES(30031,'Anna Robert','North Main
St','Tampa','FL','32328','http://www.Anna.edu','Anna','Robert','642-3141-4411','Annaaaaaa@gmail.com');
INSERT INTO Client VALUES(30032,'Kim Green','Laurel
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Ave','Atlanta','NJ','08601','http://www.Kim.com','Kim','Green','642-3141-2311','Kimmmmmmmm@gmail.com');

INSERT INTO Ragreement VALUES(0001,to_date('17-FEB-2016 10:14','DD-MON-YYYY HH24:MI'),to_date('19-FEB-2016 17:38','DD-MON-YYYY HH24:MI'),'9878.12','9900.76','Basic',30001,50003);
INSERT INTO Ragreement VALUES(0002,to_date('2-APR-2016 8:24','DD-MON-YYYY HH24:MI'),to_date('20-APR-2016 9:38','DD-MON-YYYY HH24:MI'),'7567.87','8087.47','Full',30005,50008);
INSERT INTO Ragreement VALUES(0003,to_date('15-NOV-2016 12:30','DD-MON-YYYY HH24:MI'),to_date('3-DEC-2016 13:30','DD-MON-YYYY HH24:MI'),'465.56','900.88','Upgrade',30005,50010);
INSERT INTO Ragreement VALUES(0004,to_date('1-JAN-2017 8:30','DD-MON-YYYY HH24:MI'),to_date('9-JAN-2017 10:21','DD-MON-YYYY HH24:MI'),'0034.45','0405.85','Basic',30018,50003);
INSERT INTO Ragreement VALUES(0005,to_date('1-JAN-2017 9:20','DD-MON-YYYY HH24:MI'),to_date('9-JAN-2017 19:56','DD-MON-YYYY HH24:MI'),'7754.56','8853.46','Basic',30001,50003);
INSERT INTO Ragreement VALUES(0006,to_date('1-JAN-2017 12:13','DD-MON-YYYY HH24:MI'),to_date('9-JAN-2017 16:22','DD-MON-YYYY HH24:MI'),'6434.56','7542.34','Full',30020,50011);
INSERT INTO Ragreement VALUES(0007,to_date('1-JAN-2017 17:40','DD-MON-YYYY HH24:MI'),to_date('9-JAN-2017 12:30','DD-MON-YYYY HH24:MI'),'7876.45','8756.21','Basic',30014,50011);
INSERT INTO Ragreement VALUES(0008,to_date('13-NOV-2017 15:30','DD-MON-YYYY HH24:MI'),to_date('14-NOV-2017 12:54','DD-MON-YYYY HH24:MI'),'3452.45','3543.56','Upgrade',30020,50009);
INSERT INTO Ragreement VALUES(0009,to_date('14-NOV-2017 8:21','DD-MON-YYYY HH24:MI'),to_date('1-DEC-2017 11:07','DD-MON-YYYY HH24:MI'),'2513.34','4123.56','Full',30011,50019);
INSERT INTO Ragreement VALUES(0010,to_date('7-JAN-2018 17:00','DD-MON-YYYY HH24:MI'),to_date('12-JAN-2018 16:32','DD-MON-YYYY HH24:MI'),'1345.34','1654.56','Full',30017,50015);
INSERT INTO Ragreement VALUES(0011,to_date('20-FEB-2018 12:58','DD-MON-YYYY HH24:MI'),to_date('26-FEB-2018 13:30','DD-MON-YYYY HH24:MI'),'8763.45','8908.01','Basic',30012,50021);
INSERT INTO Ragreement VALUES(0012,to_date('8-MAY-2018 7:09','DD-MON-YYYY HH24:MI'),to_date('20-MAY-2018 18:34','DD-MON-YYYY HH24:MI'),'9076.45','9234.45','Full',30022,50019);
INSERT INTO Ragreement VALUES(0013,to_date('8-DEC-2018 11:18','DD-MON-YYYY HH24:MI'),to_date('10-DEC-2018 21:00','DD-MON-YYYY HH24:MI'),'4213.52','4523.34','Basic',30008,50014);
INSERT INTO Ragreement VALUES(0014,to_date('2-JAN-2019 12:30','DD-MON-YYYY HH24:MI'),to_date('9-JAN-2019 12:30','DD-MON-YYYY HH24:MI'),'2001.23','2212.34','Basic',30011,50011);
INSERT INTO Ragreement VALUES(0015,to_date('18-APR-2019 13:30','DD-MON-YYYY HH24:MI'),to_date('23-APR-2019 14:30','DD-MON-YYYY HH24:MI'),'3321.23','3415.34','Basic',30011,50011);
INSERT INTO Ragreement VALUES(0016,to_date('23-NOV-2019 16:30','DD-MON-YYYY HH24:MI'),to_date('27-NOV-2019 7:20','DD-MON-YYYY HH24:MI'),'4132.34','5312.89','Basic',30004,50020);
INSERT INTO Ragreement VALUES(0017,to_date('3-JAN-2020 21:30','DD-MON-YYYY HH24:MI'),to_date('9-JAN-2020 22:40','DD-MON-YYYY HH24:MI'),'4132.34','8852.22','Full',30018,50003);
INSERT INTO Ragreement VALUES(0018,to_date('15-MAR-2020 8:49','DD-MON-YYYY HH24:MI'),to_date('19-MAR-2020 9:21','DD-MON-YYYY

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HH24:MI'),'4951.34','8412.45','Upgrade',30006,50016);
INSERT INTO Ragreement VALUES(0019,to_date('19-NOV-2020 10:31','DD-MON-YYYY HH24:MI'),to_date('30-NOV-2020 17:07','DD-MON-YYYY HH24:MI'),'4299.67','6889.67','Upgrade',30025,50001);
INSERT INTO Ragreement VALUES(0020,to_date('19-JUN-2020 16:31','DD-MON-YYYY HH24:MI'),to_date('30-JUL-2020 10:09','DD-MON-YYYY HH24:MI'),'4299.67','6879.67','Upgrade',30026,50005);
INSERT INTO Ragreement VALUES(0021,to_date('19-MAY-2020 10:34','DD-MON-YYYY HH24:MI'),to_date('30-MAY-2020 14:32','DD-MON-YYYY HH24:MI'),'4299.67','6859.67','Full',30027,50009);
INSERT INTO Ragreement VALUES(0022,to_date('13-APR-2020 14:31','DD-MON-YYYY HH24:MI'),to_date('30-APR-2020 10:07','DD-MON-YYYY HH24:MI'),'4299.55','6867.34','Upgrade',30028,50002);
INSERT INTO Ragreement VALUES(0023,to_date('16-AUG-2020 16:31','DD-MON-YYYY HH24:MI'),to_date('25-AUG-2020 10:09','DD-MON-YYYY HH24:MI'),'4319.67','6879.88','Upgrade',30029,50006);
INSERT INTO Ragreement VALUES(0024,to_date('13-Jul-2020 14:31','DD-MON-YYYY HH24:MI'),to_date('30-Jul-2020 10:07','DD-MON-YYYY HH24:MI'),'4279.55','6887.34','Basic',30030,50003);
INSERT INTO Ragreement VALUES(0025,to_date('12-AUG-2020 16:31','DD-MON-YYYY HH24:MI'),to_date('21-AUG-2020 10:09','DD-MON-YYYY HH24:MI'),'4367.67','6845.88','Upgrade',30031,50007);
INSERT INTO Ragreement VALUES(0026,to_date('12-Mar-2020 11:31','DD-MON-YYYY HH24:MI'),to_date('23-Mar-2020 10:08','DD-MON-YYYY HH24:MI'),'4167.67','6745.88','Upgrade',30031,50009);
INSERT INTO Ragreement VALUES(0027,to_date('13-AUG-2020 16:31','DD-MON-YYYY HH24:MI'),to_date('19-AUG-2020 10:09','DD-MON-YYYY HH24:MI'),'4377.67','6895.88','Basic',30032,50012);
INSERT INTO Ragreement VALUES(0028,to_date('01-NOV-2020 10:31','DD-MON-YYYY HH24:MI'),to_date('10-NOV-2020 17:07','DD-MON-YYYY HH24:MI'),'1299.67','2889.67','Upgrade',30025,50001);
INSERT INTO Ragreement VALUES(0029,to_date('03-SEP-2020 12:34','DD-MON-YYYY HH24:MI'),to_date('10-SEP-2020 16:32','DD-MON-YYYY HH24:MI'),'8299.67','9899.67','Full',30011,50015);
INSERT INTO Ragreement VALUES(0030,to_date('11-SEP-2020 14:31','DD-MON-YYYY HH24:MI'),to_date('17-SEP-2020 09:07','DD-MON-YYYY HH24:MI'),'4399.55','7867.34','Upgrade',30011,50016);
INSERT INTO Ragreement VALUES(0031,to_date('06-OCT-2020 17:21','DD-MON-YYYY HH24:MI'),to_date('10-OCT-2020 14:09','DD-MON-YYYY HH24:MI'),'3219.67','3879.82','Upgrade',30013,50017);
INSERT INTO Ragreement VALUES(0032,to_date('17-OCT-2020 14:31','DD-MON-YYYY HH24:MI'),to_date('24-OCT-2020 12:07','DD-MON-YYYY HH24:MI'),'4179.55','6987.34','Basic',30013,50018);
INSERT INTO Ragreement VALUES(0034,to_date('12-NOV-2020 16:31','DD-MON-YYYY HH24:MI'),to_date('19-NOV-2020 18:09','DD-MON-YYYY HH24:MI'),'4357.33','6745.99','Upgrade',30018,50019);
INSERT INTO Ragreement VALUES(0035,to_date('12-NOV-2020 11:31','DD-MON-YYYY HH24:MI'),to_date('23-NOV-2020 17:08','DD-MON-YYYY HH24:MI'),'4167.34','6745.56','Upgrade',30017,50020);
INSERT INTO Ragreement VALUES(0036,to_date('13-SEP-2020 16:31','DD-MON-YYYY HH24:MI'),to_date('19-SEP-2020 16:09','DD-MON-YYYY HH24:MI'),'4377.87','6895.90','Basic',30021,50021);
INSERT INTO Ragreement VALUES(0101,to_date('3-JUL-2020 8:49','DD-MON-YYYY HH24:MI'),to_date('6-JUL-2020 9:21','DD-MON-YYYY HH24:MI'),'4951.34','8412.45','Upgrade',30006,50001);
INSERT INTO Ragreement VALUES(0102,to_date('6-JUL-2020 10:33','DD-MON-YYYY HH24:MI'),to_date('9-JUL-2020 15:23','DD-MON-YYYY
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HH24:MI'),'1351.56','3451.25','Full',30008,50002);
INSERT INTO Ragreement VALUES(0103,to_date('21-JUL-2020 18:49','DD-MON-YYYY HH24:MI'),to_date('24-JUL-2020 13:12','DD-MON-YYYY HH24:MI'),'2413.34','4321.23','Upgrade',30010,50007);
INSERT INTO Ragreement VALUES(0104,to_date('1-AUG-2020 12:34','DD-MON-YYYY HH24:MI'),to_date('6-AUG-2020 12:33','DD-MON-YYYY HH24:MI'),'3145.45','4513.54','Basic',30012,50009);
INSERT INTO Ragreement VALUES(0105,to_date('2-AUG-2020 15:56','DD-MON-YYYY HH24:MI'),to_date('11-AUG-2020 11:29','DD-MON-YYYY HH24:MI'),'4921.34','6412.45','Basic',30013,50010);
INSERT INTO Ragreement VALUES(0106,to_date('11-AUG-2020 16:22','DD-MON-YYYY HH24:MI'),to_date('20-AUG-2020 12:30','DD-MON-YYYY HH24:MI'),'5212.45','6234.67','Upgrade',30015,50011);
INSERT INTO Ragreement VALUES(0107,to_date('23-AUG-2020 8:49','DD-MON-YYYY HH24:MI'),to_date('28-AUG-2020 20:32','DD-MON-YYYY HH24:MI'),'2341.34','2542.45','Full',30017,50012);
INSERT INTO Ragreement VALUES(0108,to_date('3-SEP-2020 8:49','DD-MON-YYYY HH24:MI'),to_date('6-SEP-2020 9:21','DD-MON-YYYY HH24:MI'),'4153.54','5542.23','Upgrade',30019,50018);
INSERT INTO Ragreement VALUES(0109,to_date('16-SEP-2020 19:30','DD-MON-YYYY HH24:MI'),to_date('19-SEP-2020 12:21','DD-MON-YYYY HH24:MI'),'6345.64','6998.45','Basic',30021,50019);
INSERT INTO Ragreement VALUES(0110,to_date('21-SEP-2020 14:17','DD-MON-YYYY HH24:MI'),to_date('26-SEP-2020 9:00','DD-MON-YYYY HH24:MI'),'4951.34','5412.45','Upgrade',30023,50020);
INSERT INTO Ragreement VALUES(0111,to_date('1-NOV-2020 14:17','DD-MON-YYYY HH24:MI'),to_date('4-NOV-2020 9:00','DD-MON-YYYY HH24:MI'),'4256.67','5725.89','Full',30001,50001);
INSERT INTO Ragreement VALUES(0112,to_date('2-NOV-2020 10:00','DD-MON-YYYY HH24:MI'),to_date('7-NOV-2020 10:00','DD-MON-YYYY HH24:MI'),'5241.56','5764.43','Upgrade',30004,50018);
INSERT INTO Ragreement VALUES(0113,to_date('9-NOV-2020 14:00','DD-MON-YYYY HH24:MI'),to_date('16-NOV-2020 11:00','DD-MON-YYYY HH24:MI'),'3653.67','5356.64','Upgrade',30006,50011);
INSERT INTO Ragreement VALUES(0114,to_date('13-NOV-2020 17:00','DD-MON-YYYY HH24:MI'),to_date('15-NOV-2020 12:00','DD-MON-YYYY HH24:MI'),'5432.67','6662.64','Basic',30004,50015);
INSERT INTO Ragreement VALUES(0115,to_date('16-NOV-2020 19:00','DD-MON-YYYY HH24:MI'),to_date('23-NOV-2020 13:00','DD-MON-YYYY HH24:MI'),'9252.78','10046.87','Full',30009,50019);
INSERT INTO Ragreement VALUES(0116,to_date('22-NOV-2020 8:00','DD-MON-YYYY HH24:MI'),to_date('28-NOV-2020 15:00','DD-MON-YYYY HH24:MI'),'5794.67','5999.89','Basic',30015,50020);
INSERT INTO Ragreement VALUES(0117,to_date('23-NOV-2020 10:30','DD-MON-YYYY HH24:MI'),to_date('27-NOV-2020 17:00','DD-MON-YYYY HH24:MI'),'6456.67','7725.89','Full',30020,50008);
INSERT INTO Ragreement VALUES(0118,to_date('19-OCT-2020 10:30','DD-MON-YYYY HH24:MI'),to_date('26-NOV-2020 17:00','DD-MON-YYYY HH24:MI'),'3526.67','4234.29','Upgrade',30021,50012);

INSERT INTO Faultreport VALUES(8001,to_date('20-FEB-2016 9:32','DD-MON-YYYY HH24:MI'),'Break Broke',1001,50003,0001);
INSERT INTO Faultreport VALUES(8002,to_date('3-DEC-2016 17:00','DD-MON-YYYY HH24:MI'),'Window Broke',1005,50010,0003);
INSERT INTO Faultreport VALUES(8003,to_date('9-JAN-2017 10:30','DD-MON-YYYY HH24:MI'),'Wiper Broke',1001,50003,0004);
INSERT INTO Faultreport VALUES(8004,to_date('9-JAN-2017 19:30','DD-MON-YYYY HH24:MI'),'Wiper Broke',1009,50011,0006);

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INSERT INTO Faultreport VALUES(8005,to_date('9-JAN-2017 15:21','DD-MON-YYYY HH24:MI'),'Cannot switch dashboard
content',1013,50011,0007);
INSERT INTO Faultreport VALUES(8006,to_date('10-DEC-2017 12:21','DD-MON-YYYY HH24:MI'),'Break Broke',1009,50019,0009);
INSERT INTO Faultreport VALUES(8007,to_date('13-JAN-2018 15:00','DD-MON-YYYY HH24:MI'),'The reversing image is
damaged',1020,50015,0010);
INSERT INTO Faultreport VALUES(8008,to_date('22-MAY-2018 20:32','DD-MON-YYYY HH24:MI'),'Window Broke',1017,50019,0012);
INSERT INTO Faultreport VALUES(8009,to_date('25-JAN-2019 8:18','DD-MON-YYYY HH24:MI'),'Wiper Broke',1021,50011,0014);
INSERT INTO Faultreport VALUES(8010,to_date('23-MAR-2020 10:33','DD-MON-YYYY HH24:MI'),'Cannot switch dashboard
content',1021,50016,0018);
INSERT INTO Faultreport VALUES(8011,to_date('11-SEP-2020 12:21','DD-MON-YYYY HH24:MI'),'Break Broke',1009,50015,0029);
INSERT INTO Faultreport VALUES(8012,to_date('20-NOV-2020 15:00','DD-MON-YYYY HH24:MI'),'The reversing image is
damaged',1020,50019,0034);
INSERT INTO Faultreport VALUES(8013,to_date('11-OCT-2020 14:32','DD-MON-YYYY HH24:MI'),'Window Broke',1017,50017,00031);
INSERT INTO Faultreport VALUES(8014,to_date('25-OCT-2020 09:18','DD-MON-YYYY HH24:MI'),'Wiper Broke',1021,50018,00032);
INSERT INTO Faultreport VALUES(8015,to_date('23-SEP-2020 10:33','DD-MON-YYYY HH24:MI'),'Cannot switch dashboard
content',1021,50021,0036);
```

PART B

```
_____Q1_____
COLUMN make FORMAT A10
COLUMN model FORMAT A10
COLUMN year FORMAT 9999
COLUMN "Date Checked" FORMAT A15
COLUMN "Start time" FORMAT A12
COLUMN "Return time" FORMAT A12
SELECT TO_CHAR(RentalNo,'0000') "Rental number",
       startdate "Start date", TO_CHAR(startdate,'HH24:MI:SS') "Start time",
       returndate "Return date", TO_CHAR(Returndate,'HH24:MI:SS') "Return time",
       licenseNo, outNo, make, model,TRUNC((SYSDATE - Year)/365) AS year,
       DECODE(datechecked, null, '-', datechecked) "Date Checked"
FROM   ragreement JOIN vehicle USING (licenseNo)
                LEFT JOIN (SELECT rentalNo, datechecked
                  FROM    faultreport) USING (rentalNo);
```

Rental num	Start date	Start time	Return date	Return time	LICENSENO	OUTNO	MAKE	MODEL	YEAR	Date Checked
0001	17-FEB-16	10:14:00	19-FEB-16	17:38:00	50003	903	Buick	Encore	3	20-FEB-16
0003	15-NOV-16	12:30:00	03-DEC-16	13:30:00	50010	902	Volkswagen	Polo	5	03-DEC-16
0004	01-JAN-17	08:30:00	09-JAN-17	10:21:00	50003	903	Buick	Encore	3	09-JAN-17
0006	01-JAN-17	12:13:00	09-JAN-17	16:22:00	50011	903	Volkswagen	Polo	7	09-JAN-17
0007	01-JAN-17	17:40:00	09-JAN-17	12:30:00	50011	903	Volkswagen	Polo	7	09-JAN-17
0009	14-NOV-17	08:21:00	01-DEC-17	11:07:00	50019	903	Audi	A3	3	10-DEC-17
0010	07-JAN-18	17:00:00	12-JAN-18	16:32:00	50015	903	Toyota	Corona	6	13-JAN-18
0012	08-MAY-18	07:09:00	20-MAY-18	18:34:00	50019	903	Audi	A3	3	22-MAY-18
0014	02-JAN-19	12:30:00	09-JAN-19	12:30:00	50011	903	Volkswagen	Polo	7	25-JAN-19
0018	15-MAR-20	08:49:00	19-MAR-20	09:21:00	50016	904	Toyota	Corona	8	23-MAR-20
0029	03-SEP-20	12:34:00	10-SEP-20	16:32:00	50015	903	Toyota	Corona	6	11-SEP-20
0034	12-NOV-20	16:31:00	19-NOV-20	18:09:00	50019	903	Audi	A3	3	20-NOV-20
0031	06-OCT-20	17:21:00	10-OCT-20	14:09:00	50017	901	Audi	A3	6	11-OCT-20
0032	17-OCT-20	14:31:00	24-OCT-20	12:07:00	50018	902	Audi	A3	3	25-OCT-20
0036	13-SEP-20	16:31:00	19-SEP-20	16:09:00	50021	901	BMW	3 Series	8	23-SEP-20
0104	01-AUG-20	12:34:00	06-AUG-20	12:33:00	50009	901	Volkswagen	Polo	3	-
0028	01-NOV-20	10:31:00	10-NOV-20	17:07:00	50001	901	Buick	Encore	4	-
0102	06-JUL-20	10:33:00	09-JUL-20	15:23:00	50002	902	Buick	Encore	3	-
0107	23-AUG-20	08:49:00	28-AUG-20	20:32:00	50012	904	Volkswagen	Polo	3	-
0025	12-AUG-20	16:31:00	21-AUG-20	10:09:00	50007	903	Ford	F-150	9	-

0024	13-JUL-20	14:31:00	30-JUL-20	10:07:00	50003	903	Buick	Encore	3	-
0103	21-JUL-20	18:49:00	24-JUL-20	13:12:00	50007	903	Ford	F-150	9	-
0005	01-JAN-17	09:20:00	09-JAN-17	19:56:00	50003	903	Buick	Encore	3	-
0008	13-NOV-17	15:30:00	14-NOV-17	12:54:00	50009	901	Volkswagen	Polo	3	-
0016	23-NOV-19	16:30:00	27-NOV-19	07:20:00	50020	904	Audi	A3	6	-
0013	08-DEC-18	11:18:00	10-DEC-18	21:00:00	50014	902	Toyota	Corona	2	-
0020	19-JUN-20	16:31:00	30-JUL-20	10:09:00	50005	901	Ford	F-150	7	-
0011	20-FEB-18	12:58:00	26-FEB-18	13:30:00	50021	901	BMW	3 Series	8	-
0114	13-NOV-20	17:00:00	15-NOV-20	12:00:00	50015	903	Toyota	Corona	6	-
0027	13-AUG-20	16:31:00	19-AUG-20	10:09:00	50012	904	Volkswagen	Polo	3	-
0112	02-NOV-20	10:00:00	07-NOV-20	10:00:00	50018	902	Audi	A3	3	-
0026	12-MAR-20	11:31:00	23-MAR-20	10:08:00	50009	901	Volkswagen	Polo	3	-
0110	21-SEP-20	14:17:00	26-SEP-20	09:00:00	50020	904	Audi	A3	6	-
0015	18-APR-19	13:30:00	23-APR-19	14:30:00	50011	903	Volkswagen	Polo	7	-
0101	03-JUL-20	08:49:00	06-JUL-20	09:21:00	50001	901	Buick	Encore	4	-
0021	19-MAY-20	10:34:00	30-MAY-20	14:32:00	50009	901	Volkswagen	Polo	3	-
0030	11-SEP-20	14:31:00	17-SEP-20	09:07:00	50016	904	Toyota	Corona	8	-
0105	02-AUG-20	15:56:00	11-AUG-20	11:29:00	50010	902	Volkswagen	Polo	5	-
0023	16-AUG-20	16:31:00	25-AUG-20	10:09:00	50006	902	Ford	F-150	7	-
0109	16-SEP-20	19:30:00	19-SEP-20	12:21:00	50019	903	Audi	A3	3	-
0002	02-APR-16	08:24:00	20-APR-16	09:38:00	50008	904	Ford	F-150	6	-
0106	11-AUG-20	16:22:00	20-AUG-20	12:30:00	50011	903	Volkswagen	Polo	7	-
0116	22-NOV-20	08:00:00	28-NOV-20	15:00:00	50020	904	Audi	A3	6	-
0115	16-NOV-20	19:00:00	23-NOV-20	13:00:00	50019	903	Audi	A3	3	-
0118	19-OCT-20	10:30:00	26-NOV-20	17:00:00	50012	904	Volkswagen	Polo	3	-
0111	01-NOV-20	14:17:00	04-NOV-20	09:00:00	50001	901	Buick	Encore	4	-
0019	19-NOV-20	10:31:00	30-NOV-20	17:07:00	50001	901	Buick	Encore	4	-
0017	03-JAN-20	21:30:00	09-JAN-20	22:40:00	50003	903	Buick	Encore	3	-
0113	09-NOV-20	14:00:00	16-NOV-20	11:00:00	50011	903	Volkswagen	Polo	7	-
0108	03-SEP-20	08:49:00	06-SEP-20	09:21:00	50018	902	Audi	A3	3	-
0117	23-NOV-20	10:30:00	27-NOV-20	17:00:00	50008	904	Ford	F-150	6	-
0022	13-APR-20	14:31:00	30-APR-20	10:07:00	50002	902	Buick	Encore	3	-
0035	12-NOV-20	11:31:00	23-NOV-20	17:08:00	50020	904	Audi	A3	6	-

53 rows selected.

```
COLUMN Outlet FORMAT A15
COLUMN Total_Revenue FORMAT A15
COLUMN Number_of_Rental FORMAT 999
COLUMN Average_Revenue FORMAT A15
COLUMN JUL FORMAT A11
COLUMN AUG FORMAT A11
COLUMN SEP FORMAT A11
SELECT  TO_CHAR(DECODE(OutNo,Null,'Outlet Total',OutNo)) AS Outlet,
        TO_CHAR(SUM(DECODE(TO_CHAR(ReturnDate,'mm'),07,CEIL(ReturnDate -StartDate)*DailyRate,0)),'$99990.99') AS JUL,
        TO_CHAR(SUM(DECODE(TO_CHAR(ReturnDate,'mm'),08,CEIL(ReturnDate -StartDate)*DailyRate,0)),'$99990.99') AS AUG,
        TO_CHAR(SUM(DECODE(TO_CHAR(ReturnDate,'mm'),09,CEIL(ReturnDate -StartDate)*DailyRate,0)),'$99990.99') AS SEP,
        TO_CHAR(SUM(DailyRate*CEIL(ReturnDate-StartDate)),'$99990.99') AS Total_Revenue,
        COUNT(RentalNo) AS Number_of_Rental,
        TO_CHAR(AVG(DailyRate*CEIL(ReturnDate-StartDate)),'$99990.99') AS Average_Revenue
FROM    Outlet JOIN Vehicle USING(OutNo)
            JOIN Ragreement USING(LicenseNo)
WHERE   TO_CHAR(ReturnDate,'YYYY') = EXTRACT(YEAR FROM SYSDATE)
  AND   TO_CHAR(ReturnDate,'Q') = 3
GROUP BY GROUPING SETS(OutNo, ());
```

OUTLET	JUL	AUG	SEP	TOTAL_REVENUE	NUMBER_OF_RENTAL	AVERAGE_REVENUE
901	$1706.00	$185.00	$228.00	$2119.00	4	$529.75
902	$140.00	$639.00	$140.00	$919.00	4	$229.75
903	$663.00	$603.00	$371.00	$1637.00	6	$272.83
904	$0.00	$372.00	$347.00	$719.00	4	$179.75
Outlet Total	$2509.00	$1799.00	$1086.00	$5394.00	18	$299.67

******comment starts*******

We find information that odometer can be reset to zero, so we choose to find the most recent ragreement, and choose that MileageAfter as current odometer reading cause the odemeter may be reset, so we can not use the max MileageAfter.

******comment ends*******

```
COLUMN licenseNo FORMAT 999999999
COLUMN make FORMAT A12
COLUMN model FORMAT A10
COLUMN "Age" FORMAT 9999
COLUMN "Miles driven" FORMAT A15
COLUMN odometer FORMAT A10
COLUMN "#Report" FORMAT 999999
SELECT licenseNo "License Number", make, model, TRUNC((SYSDATE - Year)/365) "Age",
        TO_CHAR(NVL(SUM(mileageAfter-mileageBefore),0), '999,990.99') "Miles driven",
        TO_CHAR(NVL(odometer,0), '999990.99') odometer,
        COUNT(ReportNum) "#Report"
FROM    vehicle LEFT JOIN ragreement USING (LicenseNo)
             LEFT JOIN faultreport USING (RentalNo,LicenseNo)
                 JOIN (SELECT licenseNo, MileageAfter AS odometer
                       FROM   (SELECT ROW_NUMBER() OVER(PARTITION BY LicenseNo ORDER BY ReturnDate DESC) RN,
                               LicenseNo,MileageAfter
                               FROM Vehicle LEFT JOIN Ragreement USING(LicenseNo))
                       WHERE RN = 1) USING(LicenseNo)
WHERE TRUNC((SYSDATE - YEAR)/365) >= 3
GROUP BY licenseNo, make, model, year, odometer;
```

License Number	MAKE	MODEL	Age	Miles driven	ODOMETER	#Report
50010	Volkswagen	Polo	5	1,926.43	6412.45	1
50019	Audi	A3	3	5,603.78	10046.87	3
50007	Ford	F-150	9	4,386.10	6845.88	0
50020	Audi	A3	6	4,425.10	5999.89	0
50021	BMW	3 Series	8	2,662.59	6895.90	1
50022	BMW	3 Series	7	0.00	0.00	0
50001	Buick	Encore	4	9,110.33	6889.67	0
50012	Volkswagen	Polo	3	3,426.94	4234.29	0
50023	BMW	3 Series	6	0.00	0.00	0

50004	Buick	Encore	5	0.00	0.00	0
50018	Audi	A3	3	4,719.35	5764.43	1
50005	Ford	F-150	7	2,580.00	6879.67	0
50011	Volkswagen	Polo	7	5,017.95	5356.64	3
50016	Toyota	Corona	8	6,928.90	7867.34	1
50017	Audi	A3	6	660.15	3879.82	1
50015	Toyota	Corona	6	3,139.19	6662.64	2
50002	Buick	Encore	3	4,667.48	3451.25	0
50003	Buick	Encore	3	8,820.61	6887.34	2
50008	Ford	F-150	6	1,788.82	7725.89	0
50013	Toyota	Corona	4	0.00	0.00	0
50006	Ford	F-150	7	2,560.21	6879.88	0
50009	Volkswagen	Polo	3	6,597.41	4513.54	0

22 rows selected.

_____Q4_____

The two measures we choose are rental number and faultreport number.Managers may look into the rental number, they can know which kind of car is popular among clients. Then managers can purchase this kind of cars to increase the revenue.Managers may also look into the faultreport number, if this kind of car's faultreport number is low or zero, it means this car is of good quality, it doesn't need to be repaired frequently, so it may lower the cost.

```
BREAK ON OutNo;
SELECT OutNo, Make, NVL(Rental_Num,0) AS Rental_Num, NVL(Report_Num,0) AS Report_Num
FROM    Vehicle JOIN Outlet USING(OutNo)
                LEFT OUTER JOIN (SELECT OutNo,Make,COUNT(RentalNo) AS Rental_Num, NVL(COUNT(ReportNum),0) AS Report_Num
                                 FROM    Ragreement JOIN Vehicle USING(LicenseNo)
                                                    JOIN Outlet USING(OutNo)
                                                    LEFT OUTER JOIN Faultreport USING(RentalNo,LicenseNo)
                                 GROUP BY OutNo,Make) USING(OutNo,Make)
ORDER BY OutNo,Make;
```

OUTNO	MAKE	RENTAL_NUM	REPORT_NUM
901	Audi	1	1
	BMW	2	1
	Buick	4	0
	Ford	1	0
	Toyota	0	0
	Volkswagen	4	0
902	Audi	3	1
	BMW	0	0
	Buick	2	0
	Ford	1	0
	Toyota	1	0
	Volkswagen	2	1
903	Audi	5	3
	BMW	0	0
	Buick	5	2
	Ford	2	0

	Toyota	3	2
	Volkswagen	6	3
904	Audi	4	0
	BMW	0	0
	Buick	0	0
	Ford	2	0
	Toyota	2	1
	Volkswagen	3	0

24 rows selected.

```
COLUMN Make FORMAT A12
COLUMN Quarter FORMAT A8
COLUMN FaultNum FORMAT 99999
COLUMN RentalNo FORMAT 99999
COLUMN Percentage FORMAT A10
COLUMN Rank FORMAT 99999
BREAK ON Quarter;
SELECT TO_CHAR(StartDate,'Q') AS Quarter, Make, COUNT(ReportNum) AS FaultNum,
       COUNT(rentalNo) RentalNum,
       TO_CHAR(COUNT(ReportNum)/COUNT(rentalNo) * 100,'990.99') || '%' as percentage,
       DENSE_RANK() OVER (partition BY TO_CHAR(StartDate,'Q') ORDER BY COUNT(ReportNum)/COUNT(rentalNo) DESC) Rank
FROM   Ragreement LEFT JOIN Vehicle USING(LicenseNo)
       LEFT OUTER JOIN Faultreport USING(RentalNo,LicenseNo)
WHERE EXTRACT (YEAR FROM Startdate) = EXTRACT(YEAR FROM SYSDATE)
GROUP BY TO_CHAR(StartDate,'Q'),Make
ORDER BY Quarter,Rank;
```

QUARTER	MAKE	FAULTNUM	RENTALNUM	PERCENTAGE	RANK
1	Toyota	1	1	100.00%	1
	Buick	0	1	0.00%	2
	Volkswagen	0	1	0.00%	2
2	Buick	0	1	0.00%	1
	Volkswagen	0	1	0.00%	1
	Ford	0	1	0.00%	1
3	BMW	1	1	100.00%	1
	Toyota	1	2	50.00%	2
	Buick	0	3	0.00%	3
	Ford	0	3	0.00%	3
	Volkswagen	0	5	0.00%	3
	Audi	0	3	0.00%	3
4	Audi	3	7	42.86%	1
	Ford	0	1	0.00%	2
	Toyota	0	1	0.00%	2
	Volkswagen	0	2	0.00%	2
	Buick	0	3	0.00%	2

17 rows selected.

```
COLUMN RentalNo FORMAT A5
COLUMN StartDate FORMAT A10
COLUMN ReturnDate FORMAT A10
COLUMN ClientNo FORMAT 99999
COLUMN ClientName FORMAT A17
COLUMN Outlet_Street FORMAT A15
SELECT TO_CHAR(RentalNo,'0000') AS RentalNo, StartDate, ReturnDate,ClientNo,ClientName,Outlet.Street AS Outlet_Street
FROM    Outlet JOIN Vehicle USING(OutNo)
             JOIN Ragreement USING(LicenseNo)
             JOIN Client USING(ClientNo)
WHERE   TO_CHAR(StartDate,'MON-YY') = TO_CHAR(ADD_MONTHS(SYSDATE,-1),'MON-YY')
   AND   OutNo IN (SELECT MAX(OutNo)
                FROM   Outlet JOIN Vehicle USING(OutNo)
                            JOIN Ragreement USING(LicenseNo)
                WHERE  TO_CHAR(StartDate,'MON-YY') = TO_CHAR(ADD_MONTHS(SYSDATE,-1),'MON-YY')
                GROUP BY OutNo
                HAVING COUNT(*)= (
                            SELECT MAX(COUNT(*))
                            FROM   Outlet JOIN Vehicle USING(OutNo)
                                        JOIN Ragreement USING(LicenseNo)
                            WHERE  TO_CHAR(StartDate,'MON-YY') = TO_CHAR(ADD_MONTHS(SYSDATE,-1),'MON-YY')
                            GROUP BY OutNo));
```

```
RENTA STARTDATE  RETURNDATE CLIENTNO CLIENTNAME         OUTLET_STREET
----- ---------- ---------- -------- ----------------- ---------------
 0114 13-NOV-20  15-NOV-20    30004 Jones Ana          MAGNOLIA LANE
 0113 09-NOV-20  16-NOV-20    30006 Davis Chris        MAGNOLIA LANE
 0115 16-NOV-20  23-NOV-20    30009 Moore Henry        MAGNOLIA LANE
 0034 12-NOV-20  19-NOV-20    30018 Garcia Willam      MAGNOLIA LANE
```

```
COLUMN model FORMAT A10
COLUMN "#Vehicle" FORMAT 9999
COLUMN "Percentage" FORMAT A12
COLUMN "Rank" FORMAT 99999
SELECT model "Model", N_model "#Vehicle",
       TO_CHAR(proportion, '999,990.99') || '%' "Percentage",
       rank() over (ORDER BY proportion DESC) "Rank"
FROM   (SELECT model, N_model, modelrevenue,
               (modelrevenue/SUM(modelrevenue) over ()) * 100 AS proportion
        FROM   (SELECT distinct model FROM vehicle)
               LEFT JOIN (SELECT model,COUNT(model) AS N_model
                          FROM   vehicle
                          GROUP BY model) USING (model)
               LEFT JOIN (SELECT model, SUM(revenue) AS modelrevenue
                          FROM   (SELECT model, (returndate-startdate)*dailyrate AS revenue
                                  FROM   (SELECT licenseNo, model,dailyrate FROM vehicle)
                                         JOIN (SELECT rentalNo,licenseNo,startdate,returndate FROM ragreement) USING (licenseNo)
                                  WHERE  7<=extract(month FROM startdate) and extract(month FROM startdate)<=9
                                    and extract(year FROM startdate) = extract(year FROM sysdate)
                                      and returndate is not null)
                          GROUP BY model) USING (model)
        GROUP BY model, N_model, modelrevenue);
```

Model	#Vehicle	Percentage	Rank
Polo	4	31.33%	1
Encore	4	21.54%	2
F-150	4	19.51%	3
Corona	4	11.85%	4
A3	4	9.49%	5
3 Series	4	6.29%	6

6 rows selected.

_____Q8_____

```
COLUMN OutNo FORMAT 999
COLUMN EmpNo FORMAT 99999
COLUMN Name FORMAT A17
COLUMN Supervisor_Name FORMAT A17
COLUMN Gender FORMAT A7
COLUMN Age FORMAT 99
BREAK ON OutNo;
SELECT E1.OutNo AS OutNo,E1.EmpNo, E1.Fname||' '||E1.Lname AS Name,
       DECODE(E2.Fname||' '||E2.Lname,' ','No supervisor',E2.Fname||' '||E2.Lname) AS Supervisor_Name,
       TO_CHAR(MONTHS_BETWEEN(SYSDATE,E1.HireDate)/12,'90.9') AS Work_Years,
       FLOOR(MONTHS_BETWEEN(SYSDATE,E1.DOB)/12) AS Age,
       E1.Gender AS Gender,TO_CHAR(E1.Salary,'$99999') AS Salary,
       E1.OutNo AS Workplace,
       NVL(S_Num,0) AS Supervise_Num,
       DENSE_RANK() OVER (partition by E1.OutNo order by E1.Salary DESC) AS Rank,
       TO_CHAR((max_salary - E1.Salary),'$99999') AS Difference
FROM    Employee E1 LEFT OUTER JOIN Employee E2 ON(E2.EmpNo = E1.SupervisorNo)
                  LEFT OUTER JOIN (SELECT E3.EmpNo AS Emp_No,COUNT(DISTINCT E4.EmpNo) AS S_Num
                                   FROM    Employee E3,Employee E4
                                   WHERE   E3.EmpNo = E4.SupervisorNo
                                   GROUP BY E3.EmpNo) ON (E1.EmpNo = Emp_No)
                  LEFT OUTER JOIN (SELECT OutNo AS Out_No,MAX(Salary) AS max_salary
                                   FROM    Employee
                                   GROUP BY OutNo) ON (E1.OutNo = Out_No);
```

OUTNO	EMPNO	NAME	SUPERVISOR_NAME	WORK_YEARS	AGE	GENDER	SALARY	WORKPLACE	SUPERVISE_NUM	RANK	DIFFERENCE
901	1025	Cody Young	No supervisor	15.3	32	Male	$20000	901	6	1	$0
	1005	Steve Hall	SAM SMITH	13.5	42	Male	$19000	901	0	2	$1000
	1009	JANICE JONES	TAMARA KZOCHSKY	8.0	27	Male	$18000	901	0	3	$2000
	1013	LISA PORTER	Henry Carter	6.7	27	Female	$15000	901	0	4	$5000
	1017	Jill Bertram	Mary Whitestar	4.9	26	Male	$14000	901	0	5	$6000
	1021	Steve Newton	Kelly Milton	2.5	21	Male	$13000	901	0	6	$7000
	1001	Jim Codd	Joe Smith	16.2	44	Male	$11000	901	0	7	$9000
902	1014	OSCAR FIELDS	Henry Carter	5.1	24	Male	$17000	902	0	1	$0
	1018	Kate Gates	Mary Whitestar	3.5	24	Female	$16000	902	0	2	$1000
	1022	Willam Belli	Kelly Milton	3.1	26	Male	$15000	902	0	3	$2000
	1002	Peter Chen	Joe Smith	15.0	46	Male	$13000	902	0	4	$4000

	1006 Carol Jones	SAM SMITH	8.5	30 Male	$12000	902	0	5	$5000
	1010 JAMES AUSTIN	TAMARA KZOCHSKY	5.3	25 Male	$10000	902	0	6	$7000
903	1015 ANTHONY WILKINSON	Henry Carter	7.2	26 Male	$19000	903	0	1	$0
	1019 Aria Wheeler	Mary Whitestar	4.5	25 Female	$18000	903	0	2	$1000
	1023 Lisa Swift	Kelly Milton	9.3	29 Female	$17000	903	0	3	$2000
	1003 Adam Miller	Joe Smith	13.7	43 Male	$15000	903	0	4	$4000
	1007 Chris McCarthy	SAM SMITH	7.1	28 Male	$14000	903	0	5	$5000
	1011 SHEILA MARTINEZ	TAMARA KZOCHSKY	6.5	25 Female	$11000	903	0	6	$8000
904	1016 Henry Carter	Cody Young	4.1	26 Male	$26000	904	3	1	$0
	1024 Kelly Milton	Cody Young	8.0	29 Female	$19000	904	3	2	$7000
	1004 Joe Smith	Cody Young	13.6	43 Male	$17000	904	3	3	$9000
	1008 SAM SMITH	Cody Young	5.1	26 Male	$16000	904	3	4	$10000
	1012 TAMARA KZOCHSKY	Cody Young	2.4	23 Female	$13000	904	3	5	$13000
	1020 Mary Whitestar	Cody Young	3.8	23 Female	$11000	904	3	6	$15000

25 rows selected.

```
COLUMN Employee_Name FORMAT A30
COLUMN Position FORMAT A12
COLUMN Street FORMAT A18
SELECT Level,
       LPAD(' ', 3*(Level - 1)) || EmpNo ||' '||
       Fname||' '||Lname AS Employee_Name,
       Position,Street,FaultNum
FROM   Employee JOIN Outlet USING(OutNo)
                JOIN (SELECT EmpNo,COUNT(ReportNum) AS FaultNum
                      FROM   Employee LEFT OUTER JOIN
                             (SELECT * FROM Faultreport
                              WHERE (SYSDATE - DateChecked < 90)) USING(EmpNo)
                      GROUP BY EmpNo) USING(EmpNo)
START WITH EmpNO = 1025
CONNECT BY PRIOR EmpNo = SupervisorNo;
```

LEVEL	EMPLOYEE_NAME	POSITION	STREET	FAULTNUM
1	1025 Cody Young	CEO	EAST SAVANNAH	0
2	1004 Joe Smith	IT	ROUNDABOUT WAY	0
3	1001 Jim Codd	IT	EAST SAVANNAH	0
3	1002 Peter Chen	IT	TILA CIRCLE	0
3	1003 Adam Miller	IT	MAGNOLIA LANE	0
2	1008 SAM SMITH	HR	ROUNDABOUT WAY	0
3	1005 Steve Hall	HR	EAST SAVANNAH	0
3	1006 Carol Jones	HR	TILA CIRCLE	0
3	1007 Chris McCarthy	HR	MAGNOLIA LANE	0
2	1012 TAMARA KZOCHSKY	Marketing	ROUNDABOUT WAY	0
3	1009 JANICE JONES	Marketing	EAST SAVANNAH	1
3	1010 JAMES AUSTIN	Marketing	TILA CIRCLE	0
3	1011 SHEILA MARTINEZ	Marketing	MAGNOLIA LANE	0
2	1016 Henry Carter	Administive	ROUNDABOUT WAY	0
3	1013 LISA PORTER	Administive	EAST SAVANNAH	0
3	1014 OSCAR FIELDS	Administive	TILA CIRCLE	0
3	1015 ANTHONY WILKINSON	Administive	MAGNOLIA LANE	0

2	1020 Mary Whitestar	Advertiser	ROUNDABOUT WAY	1
3	1017 Jill Bertram	Advertiser	EAST SAVANNAH	1
3	1018 Kate Gates	Advertiser	TILA CIRCLE	0
3	1019 Aria Wheeler	Advertiser	MAGNOLIA LANE	0
2	1024 Kelly Milton	Machinist	ROUNDABOUT WAY	0
3	1021 Steve Newton	Machinist	EAST SAVANNAH	2
3	1022 Willam Belli	Machinist	TILA CIRCLE	0
3	1023 Lisa Swift	Machinist	MAGNOLIA LANE	0

25 rows selected.

```
COLUMN Vehicle_Num FORMAT 999
COLUMN Rental_Num FORMAT 99999
COLUMN AVG_Distance FORMAT 999990.99
COLUMN RenNum_per_Emp FORMAT 90.9
SELECT T_Rental.OutNo, T_Emp_Vehicle.Vehicle_N AS Vehicle_Num,
        T_Rental.Rental_N AS Rental_Num,
        T_Rental.AVG_D AS AVG_Distance,
        T_Emp_Vehicle.Emp_N AS Emp_Num,
        T_Rental.Rental_N/T_Emp_Vehicle.Emp_N AS RenNum_per_Emp
FROM   (SELECT OutNo, COUNT(RentalNo) AS Rental_N,
               AVG(MileageAfter - MileageBefore) AS AVG_D
        FROM    Ragreement JOIN Vehicle USING(LicenseNo)
                           JOIN Outlet USING(OutNo)
        WHERE   TO_NUMBER(SYSDATE-StartDate) <= 60
        GROUP BY OutNo)T_Rental,
        (SELECT OutNo,COUNT(DISTINCT LicenseNo) AS Vehicle_N,
                COUNT(DISTINCT EmpNo) AS Emp_N
        FROM    Outlet JOIN Employee USING(OutNo)
                       JOIN Vehicle USING(OutNo)
        GROUP BY OutNO)T_Emp_Vehicle
WHERE T_Rental.OutNo = T_Emp_Vehicle.OutNo;
```

OUTNO	VEHICLE_NUM	RENTAL_NUM	AVG_DISTANCE	EMP_NUM	RENNUM_PER_EMP
901	6	4	1327.34	7	0.6
902	6	2	1665.33	6	0.3
903	6	4	1528.92	6	0.7
904	6	4	1940.07	6	0.7

```
_____Q11_____
COLUMN period FORMAT A10
COLUMN percentage FORMAT A10
COLUMN N_start FORMAT 99999
COLUMN N_return FORMAT 99999
COLUMN N_transaction FORMAT 99999
SELECT startperiod AS period, N_start, N_return, N_start + N_return AS N_transaction,
       TO_CHAR((ratio_to_report(SUM(N_start + N_return)) over())*100, '990.99') || '%' AS percentage
FROM    (SELECT startperiod, COUNT(rentalNo) AS N_start
         FROM    (SELECT rentalNo,
                            (CASE
                                      WHEN TO_CHAR(startdate,'HH24')>= 6 AND TO_CHAR(startdate,'HH24')< 12 THEN 'Morning'
                                      WHEN TO_CHAR(startdate,'HH24')>= 12 AND TO_CHAR(startdate,'HH24')< 18 THEN 'Afternoon'
                                      WHEN TO_CHAR(startdate,'HH24')>= 18 AND TO_CHAR(startdate,'HH24')< 23 THEN 'Evening'
                             END) AS startperiod
                  FROM    (SELECT rentalNo, startdate FROM ragreement))
                  GROUP BY startperiod) JOIN
        (SELECT returnperiod, COUNT(rentalNo) AS N_return
         FROM    (SELECT rentalNo,
                            (CASE
                                       WHEN TO_CHAR(returndate,'HH24')>= 6 AND TO_CHAR(returndate,'HH24')< 12 THEN 'Morning'
                                       WHEN TO_CHAR(returndate,'HH24')>= 12 AND TO_CHAR(returndate,'HH24')< 18 THEN 'Afternoon'
                                       WHEN TO_CHAR(returndate,'HH24')>= 18 AND TO_CHAR(returndate,'HH24')< 23 THEN 'Evening'
                             END) AS returnperiod
                   FROM    (SELECT rentalNo,returndate FROM ragreement))
                  GROUP BY returnperiod) ON (startperiod = returnperiod)
GROUP BY startperiod, N_start, N_return, N_start + N_return;


PERIOD     N_START N_RETURN N_TRANSACTION PERCENTAGE
---------- ------- -------- ------------- ----------
Evening          4        6            10      9.43%
Morning         21       20            41     38.68%
Afternoon       28       27            55     51.89%
```

```
COLUMN MgrNo FORMAT 9999
COLUMN MgrName FORMAT A17
COLUMN OutletNum FORMAT 999
COLUMN RenNum_per_Outlet FORMAT 990.99
COLUMN ReportNum_per_Outlet FORMAT 990.99
SELECT T_Mgr.MNO AS MgrNo,
        T_Mgr.MName AS MgrName,
        DECODE(T_Mgr.Outlet_N,NULL,0,T_Mgr.Outlet_N) AS OutletNum,
        DECODE(T_RenNum.Ren_N/T_Mgr.Outlet_N,NULL,0,T_RenNum.Ren_N/T_Mgr.Outlet_N)
        AS RenNum_per_Outlet,
        DECODE(T_ReportNum.Report_N/T_Mgr.Outlet_N,NULL,0,T_ReportNum.Report_N/T_Mgr.Outlet_N)
        AS ReportNum_per_Outlet
FROM
        (SELECT ManagerNo AS MNO, COUNT(Outlet.OutNo) AS Outlet_N,
                Fname ||' '||Lname AS MName
        FROM Outlet, Employee
        WHERE Outlet.ManagerNo = Employee.EmpNo
        GROUP BY ManagerNo, Fname, Lname) T_Mgr
  LEFT JOIN
        (SELECT ManagerNo,COUNT(RentalNo) AS Ren_N
        FROM Ragreement,Vehicle,Outlet
        WHERE Ragreement.LicenseNo = Vehicle.LicenseNo
          AND Vehicle.OutNo = Outlet.OutNo
        GROUP BY ManagerNo) T_RenNum
  ON T_Mgr.MNO = T_RenNum.ManagerNo
  LEFT JOIN
        (SELECT ManagerNo,COUNT(ReportNum) AS Report_N
        FROM Faultreport JOIN Employee USING(EmpNo)
                        JOIN Outlet USING(OutNo)
        GROUP BY ManagerNo) T_ReportNum
  ON T_Mgr.MNO = T_ReportNum.ManagerNo
UNION ALL
SELECT NULL,'Grand Total:',COUNT(DISTINCT OutNo),
        COUNT(Ragreement.RentalNo)/COUNT(DISTINCT OutNo),
        COUNT(ReportNum)/COUNT(DISTINCT OutNo)
FROM Ragreement JOIN Vehicle USING(LicenseNo)
                JOIN Outlet USING(OutNo)
                LEFT JOIN Faultreport ON Faultreport.RentalNo = Ragreement.RentalNo;
```

MGRNO	MGRNAME	OUTLETNUM	RENNUM_PER_OUTLET	REPORTNUM_PER_OUTLET
1009	JANICE JONES	1	11.00	2.00
1016	Henry Carter	2	10.50	6.50
1019	Aria Wheeler	1	21.00	0.00
	Grand Total:	4	13.25	3.75

```
COLUMN "MON-#Rtl" FORMAT 99999999
COLUMN "MON-#Rpt" FORMAT 99999999
COLUMN "TUE-#Rtl" FORMAT 99999999
COLUMN "TUE-#Rpt" FORMAT 99999999
COLUMN "WED-#Rtl" FORMAT 99999999
COLUMN "WED-#Rpt" FORMAT 99999999
COLUMN "THU-#Rtl" FORMAT 99999999
COLUMN "THU-#Rpt" FORMAT 99999999
COLUMN "FRI-#Rtl" FORMAT 99999999
COLUMN "FRI-#Rpt" FORMAT 99999999
COLUMN "SAT-#Rtl" FORMAT 99999999
COLUMN "SAT-#Rpt" FORMAT 99999999
COLUMN "SUN-#Rtl" FORMAT 99999999
COLUMN "SUN-#Rpt" FORMAT 99999999
COLUMN outno        FORMAT A6
COLUMN "Ttl0lt"     FORMAT 999999
SELECT DECODE(outNo, null, 'TtlDay', outNo) AS outNo,
       SUM(DECODE (startday,'MON',1,0)) "MON-#Rtl", SUM(DECODE (checkedday,'MON',1,0)) "MON-#Rpt",
         SUM(DECODE (startday,'TUE',1,0))     "TUE-#Rtl", SUM(DECODE (checkedday,'TUE',1,0)) "TUE-#Rpt",
         SUM(DECODE (startday,'WED',1,0))     "WED-#Rtl", SUM(DECODE (checkedday,'WED',1,0)) "WED-#Rpt",
         SUM(DECODE (startday,'THU',1,0))     "THU-#Rtl", SUM(DECODE (checkedday,'THU',1,0)) "THU-#Rpt",
         SUM(DECODE (startday,'FIR',1,0))     "FIR-#Rtl", SUM(DECODE (checkedday,'FIR',1,0)) "FIR-#Rpt",
         SUM(DECODE (startday,'SAT',1,0))     "SAT-#Rtl", SUM(DECODE (checkedday,'SAT',1,0)) "SAT-#Rpt",
         SUM(DECODE (startday,'SUN',1,0))     "SUN-#Rtl", SUM(DECODE (checkedday,'SUN',1,0)) "SUN-#Rpt",
         COUNT(rentalNo) + COUNT(reportNum) "Ttl0lt"
FROM    (SELECT outNo, rtl.rentalNo, TO_CHAR(startdate,'DY') AS startday, reportNum, TO_CHAR(datechecked,'DY') AS checkedday
         FROM    (SELECT outNo, rentalNo, startdate
                 FROM    outlet LEFT JOIN vehicle USING (outNo)
                              LEFT JOIN ragreement USING (licenseNo)
                  WHERE  TO_CHAR(sysdate,'mm')-3 <= TO_CHAR(startdate,'mm')
                      AND  EXTRACT(year FROM sysdate) = EXTRACT(year FROM startdate)) rtl LEFT JOIN
              (SELECT outNo, rentalNo, datechecked, ReportNum
               FROM    outlet LEFT JOIN vehicle USING (outNo)
                              LEFT JOIN ragreement USING (licenseNo)
                              LEFT JOIN faultreport USING (rentalNo)
                  WHERE  TO_CHAR(sysdate,'mm')-3 <= TO_CHAR(datechecked,'mm')
                    AND  EXTRACT(year FROM sysdate) = EXTRACT(year FROM startdate)) USING (outNo))
GROUP BY GROUPING SETS (outNo, ());
```

OUTNO	MON-#Rtl	MON-#Rpt	TUE-#Rtl	TUE-#Rpt	WED-#Rtl	WED-#Rpt	THU-#Rtl	THU-#Rpt	FIR-#Rtl	FIR-#Rpt	SAT-#Rtl	SAT-#Rpt	SUN-#Rtl	SUN-#Rpt	TtlOlt
901	0	0	2	0	0	5	2	0	0	0	0	0	6	5	20
902	1	0	0	0	0	0	1	0	0	0	1	0	0	3	6
903	4	0	0	0	2	0	4	0	0	0	0	0	0	0	24
904	3	0	0	0	0	0	1	0	0	0	0	0	1	0	6
TtlDay	8	0	2	0	2	5	8	0	0	0	1	0	7	8	56

_____Q14_____

```
SELECT ClientName, SUM(DailyRate*CEIL(ReturnDate-StartDate)) AS Revenue_OR_RentalNum
FROM    Ragreement JOIN Vehicle USING(LicenseNo)
             JOIN Client USING(ClientNo)
WHERE   TO_CHAR(StartDate,'YYYY') = TO_CHAR(SYSDATE,'YYYY')
GROUP   BY ClientName
HAVING SUM(DailyRate*CEIL(ReturnDate-StartDate)) = (
                                    SELECT MAX(SUM(DailyRate*CEIL(ReturnDate-StartDate)))
                                    FROM    Ragreement JOIN Vehicle USING(LicenseNo)
                                                 JOIN Client USING(ClientNo)
                                    WHERE   TO_CHAR(StartDate,'YYYY') = TO_CHAR(SYSDATE,'YYYY')
                                    GROUP BY ClientNo)
UNION ALL
SELECT ClientName, COUNT(RentalNo) AS Revenue_OR_RentalNum
FROM    Ragreement JOIN Vehicle USING(LicenseNo)
             JOIN Client USING(ClientNo)
WHERE   TO_CHAR(StartDate,'YYYY') = TO_CHAR(SYSDATE,'YYYY')
GROUP   BY ClientName
HAVING COUNT(RentalNo) = (SELECT MAX(COUNT(RentalNo))
                          FROM    Ragreement JOIN Vehicle USING(LicenseNo)
                                       JOIN Client USING(ClientNo)
                          WHERE   TO_CHAR(StartDate,'YYYY') = TO_CHAR(SYSDATE,'YYYY')
                          GROUP BY ClientNo);
```

CLIENTNAME	REVENUE_OR_RENTALNUM
Kris Green	1558
Davis Chris	3
Smith Scott	3
Robinson Johnson	3

```
COLUMN outNo FORMAT 99999
COLUMN state FORMAT A5
COLUMN proportion FORMAT A10
COLUMN N_client FORMAT 99999999
COLUMN N_rental FORMAT 99999999
SELECT outNo, state, N_client, N_rental,N_totalclient,N_totalrental,
        TO_CHAR(N_rental/N_totalrental * 100, '90.99') || '%' AS Rental_proportion,
        TO_CHAR(N_client/N_totalclient * 100, '90.99') || '%' AS Client_proportion
FROM   (SELECT outNo, Outlet.state AS state, COUNT(distinct ClientNo) AS N_client, COUNT(rentalNo) AS N_rental
        FROM    Outlet LEFT JOIN Vehicle USING(OutNo)
                        LEFT JOIN Ragreement USING(LicenseNo)
                        JOIN Client USING(ClientNo)
        WHERE Outlet.state = Client.state
        GROUP BY outNo, Outlet.state)
        JOIN
        (SELECT outNo, COUNT(DISTINCT ClientNo) AS N_totalclient, COUNT(rentalNo) AS N_totalrental
        FROM    Outlet LEFT JOIN Vehicle USING(OutNo)
                        LEFT JOIN Ragreement USING(LicenseNo)
        GROUP BY OutNo) USING (OutNo)
ORDER BY OutNo;
```

OUTNO	STATE	N_CLIENT	N_RENTAL	N_TOTALCLIENT	N_TOTALRENTAL	RENTAL_PROPORT	CLIENT_PROPORT
901	GA	4	5	10	12	41.67%	40.00%
902	IL	2	2	7	9	22.22%	28.57%
903	FL	2	2	15	21	9.52%	13.33%
904	NJ	1	1	10	11	9.09%	10.00%

******comment starts******
In statistics, the quarter needs to arrange the numbers from small to large,
but in this question, we need to arrange the revenue, so I think it should
be range from high revenue to low revenue, this makes sense, instead of rank
from low to high, because the company wants to know who is the client that
spends the most money, so I arranged revenue from high to low.
******comment ends******

```
SELECT ClientNo,ClientName, TO_CHAR(NVL(Total_Amount,0),'$99990.99') AS Total_Amount,
       NTILE(4) OVER (order by Total_Amount DESC NULLS LAST) AS Quartile
FROM   Client LEFT OUTER JOIN (SELECT ClientNo,SUM(DailyRate*CEIL(ReturnDate-StartDate)) AS Total_Amount
                                FROM Ragreement JOIN Vehicle USING(LicenseNo)
                                GROUP BY ClientNo) USING (ClientNo);
```

CLIENTNO	CLIENTNAME	TOTAL_AMOUNT	QUARTILE
30026	Kris Green	$1558.00	1
30021	Robinson Johnson	$1536.00	1
30011	Thomas Stan	$1487.00	1
30005	Brown Adam	$1273.00	1
30025	Ariana Green	$814.00	1
30018	Garcia Willam	$792.00	1
30017	Thomson Steve	$728.00	1
30031	Anna Robert	$713.00	1
30013	Smith Scott	$708.00	2
30028	Aria Blue	$595.00	2
30030	Karel Robert	$561.00	2
30006	Davis Chris	$539.00	2
30015	Harris Lisa	$514.00	2
30001	Smith Amelia	$507.00	2
30020	Martinez Swift	$494.00	2
30012	Jackson Jim	$451.00	2
30027	Jane Green	$444.00	3
30022	Clark Howard	$429.00	3
30004	Jones Ana	$367.00	3
30029	Amy Young	$324.00	3
30014	White Chris	$264.00	3
30008	Wilson Jill	$248.00	3

```
30009 Moore Henry          $231.00                3
30032 Kim Green            $186.00                3
30023 Lewis Donald         $155.00                4
30019 Colin Young          $140.00                4
30010 Taylor Mary          $102.00                4
30024 Walker Hunk            $0.00                4
30003 Williams Bill          $0.00                4
30016 Martin Bob             $0.00                4
30002 Johnson Scott          $0.00                4
30007 Miller Kelly           $0.00                4


32 rows selected.
```

```
_____Q17_____
COLUMN type FORMAT A28
COLUMN n_client FORMAT 99999999
COLUMN N_rental FORMAT 99999999
SELECT distinct Type, n_client,
          (SUM(n_rentalperclient) over (partition BY type)) AS n_rental
FROM    client JOIN (SELECT clientNo,
                          (CASE
                          WHEN webaddress IS NULL THEN 'Not Available'
                          WHEN webaddress LIKE '%.edu' THEN 'Educational Institution'
                          WHEN webaddress LIKE '%.gov' THEN 'Government Agency'
                          WHEN webaddress LIKE '%.org' THEN 'For-profit Organization'
                          WHEN webaddress LIKE '%.com' THEN 'For-profit Company'
                          ELSE 'Other'
                          END) AS type
               FROM    client) USING (clientNo)
          JOIN (SELECT clientNo, COUNT(rentalNo) AS n_rentalperclient
               FROM    client LEFT JOIN (SELECT rentalNo, clientNo
                                    FROM    ragreement
                                    WHERE   extract(year FROM startdate) = extract(year FROM startdate)
                                      AND   TO_CHAR(startdate,'Q') = TO_CHAR(sysdate,'Q')-1) USING (clientNo)
               GROUP BY clientNo) USING (clientNo)
          JOIN (SELECT type, COUNT(clientNo) AS n_client
               FROM    (SELECT clientNo,
                          (CASE
                          WHEN webaddress IS NULL THEN 'Not Available'
                          WHEN webaddress LIKE '%.edu' THEN 'Educational Institution'
                          WHEN webaddress LIKE '%.gov' THEN 'Government Agency'
                          WHEN webaddress LIKE '%.org' THEN 'For-profit Organization'
                          WHEN webaddress LIKE '%.com' THEN 'For-profit Company'
                          ELSE 'Other'
                          END) AS Type
                     FROM    client)
                 GROUP BY type) USING (type);
```

```
TYPE                           N_CLIENT  N_RENTAL
---------------------------- ---------- ----------
Educational Institution              7          6
Other                                4          0
Not Available                        2          0
Government Agency                    5          4
For-profit Organization              3          1
For-profit Company                  11          6


6 rows selected.
```

*****comment starts******
The most active client I think it refers to the client who rents the most rentals in the third quarter of this year, active refers to frequency, so it means the amount of rentals. And if the company wants to find who spends the most money, it may say find out who is the richest client. To conclude, we think the most active client means the client who has the most rentals.
*****comment ends******

```
COLUMN ClientNo FORMAT 99999
COLUMN ClientName FORMAT A17
COLUMN ContactName FORMAT A19
COLUMN Phone FORMAT A16
SELECT ClientNo, ClientName,
       Contact_Fname||' '||Contact_Lname AS ContactName,
       Phone
FROM   Client
WHERE  ClientNo IN (
                  SELECT ClientNo
                  FROM   Ragreement JOIN Client USING(ClientNo)
                  WHERE  EXTRACT(YEAR FROM StartDate) = EXTRACT(YEAR FROM SYSDATE)
                    AND  TO_CHAR(StartDate,'Q') = 3
                    AND  WebAddress LIKE '%.gov%'
                  GROUP BY ClientNo
                  HAVING COUNT(RentalNo) = (
                                         SELECT MAX(COUNT(RentalNo))
                                         FROM   Ragreement JOIN Client USING(ClientNo)
                                         WHERE  TO_CHAR(StartDate,'YY') = TO_CHAR(SYSDATE,'YY')
                                           AND  TO_CHAR(StartDate,'Q') = 3
                                           AND  WebAddress LIKE '%.gov%'
                                         GROUP BY ClientNo));
```

```
CLIENTNO CLIENTNAME        CONTACTNAME         PHONE
-------- ----------------- ------------------- ----------------
   30011 Thomas Stan       Thomas Train        976-3141-1754
```

```
COLUMN table_name FORMAT A13
COLUMN COLUMN_name FORMAT A15
COLUMN constraint_name FORMAT A25
COLUMN constraint_type FORMAT A16
COLUMN Search_condition FORMAT A30
COLUMN Table_FK_re FORMAT A15
COLUMN Column_FK_re FORMAT A15
SELECT T1.table_name, T1.column_name, T2.constraint_name, T2.constraint_type,
        Search_condition, T2.table_name Table_FK_re, T2.column_name Column_FK_re
FROM    (SELECT table_name, column_name, column_id
         FROM   user_tab_columns) T1
             LEFT JOIN (SELECT user_constraints.table_name, column_name,
                            user_constraints.constraint_name,
                                (CASE
                                        WHEN UPPER(constraint_type)='C' THEN 'Check or NN'
                                        WHEN UPPER(constraint_type)='P' THEN 'Primary Key'
                                        WHEN UPPER(constraint_type)='R' THEN 'Foreign Key'
                                        WHEN UPPER(constraint_type)='U' THEN 'Unique'
                                        WHEN UPPER(constraint_type)='V' THEN 'With Check option'
                                        WHEN UPPER(constraint_type)='O' THEN 'Read Only option'
                                END) constraint_type, Search_condition
                        FROM    user_constraints JOIN user_cons_columns
                                        ON user_cons_columns.constraint_name=user_constraints.constraint_name) T2
             ON T1.table_name=T2.table_name AND T1.column_name=T2.column_name
ORDER BY T1.table_name, column_id, column_name;
```

TABLE_NAME	COLUMN_NAME	CONSTRAINT_NAME	CONSTRAINT_TYPE	SEARCH_CONDITION	TABLE_FK_RE	COLUMN_FK_RE
CLIENT	CLIENTNO	CLIENT_CLIENTNO_PK	Primary Key		CLIENT	CLIENTNO
CLIENT	CLIENTNAME					
CLIENT	STREET					
CLIENT	CITY					
CLIENT	STATE	CLIENT_STATE_CK	Check or NN	State In ('AL','AK','AZ','AR', 'CA','CO','CT','DE','FL','GA', 'HI','ID','IL','IN',	CLIENT	STATE
CLIENT	ZIPCODE					
CLIENT	WEBADDRESS	CLIENT_WEBADDRESS_CK	Check or NN	WebAddress LIKE 'http%://%'	CLIENT	WEBADDRESS

Table	Column	Constraint Name	Constraint Type	Condition	Ref Table	Ref Column
CLIENT	CONTACT_FNAME					
CLIENT	CONTACT_LNAME					
CLIENT	PHONE	CLIENT_PHONE_CK	Check or NN	REGEXP_LIKE(Phone, '^([0-9]{3}-[0-9]{4}-[0-9]{4})$')	CLIENT	PHONE
CLIENT	EMAIL					
EMPLOYEE	EMPNO	EMPLOYEE_EMPNO_PK	Primary Key		EMPLOYEE	EMPNO
EMPLOYEE	LNAME					
EMPLOYEE	FNAME					
EMPLOYEE	POSITION					
EMPLOYEE	PHONE	EMPLOYEE_PHONE_CK	Check or NN	REGEXP_LIKE(Phone, '^([0-9]{3}-[0-9]{4}-[0-9]{4})$')	EMPLOYEE	PHONE
EMPLOYEE	EMAIL	EMPLOYEE_EMAIL_CK	Check or NN	Email LIKE '%_@carrental.com'	EMPLOYEE	EMAIL
EMPLOYEE	DOB	EMPLOYEE_AGE_CK	Check or NN	(HireDate - DOB)/365 > 14	EMPLOYEE	DOB
EMPLOYEE	GENDER	EMPLOYEE_GENDER_CK	Check or NN	Gender In ('Female', 'Male')	EMPLOYEE	GENDER
EMPLOYEE	SALARY					
EMPLOYEE	HIREDATE	EMPLOYEE_AGE_CK	Check or NN	(HireDate - DOB)/365 > 14	EMPLOYEE	HIREDATE
EMPLOYEE	OUTNO	EMPLOYEE_OUTNO_FK	Foreign Key		EMPLOYEE	OUTNO
EMPLOYEE	SUPERVISORNO	EMPLOYEE_SUPERVISORNO_FK	Foreign Key		EMPLOYEE	SUPERVISORNO
FAULTREPORT	REPORTNUM	FAULTREPORT_REPORTNUM_PK	Primary Key		FAULTREPORT	REPORTNUM
FAULTREPORT	DATECHECKED					
FAULTREPORT	COMMENTS					
FAULTREPORT	EMPNO	FAULTREPORT_EMPNO_FK	Foreign Key		FAULTREPORT	EMPNO
FAULTREPORT	LICENSENO	FAULTREPORT_LICENSENO_FK	Foreign Key		FAULTREPORT	LICENSENO
FAULTREPORT	RENTALNO	FAULTREPORT_RENTALNO_FK	Foreign Key		FAULTREPORT	RENTALNO
OUTLET	OUTNO	OUTLET_OUTNO_PK	Primary Key		OUTLET	OUTNO
OUTLET	STREET					
OUTLET	CITY					
OUTLET	STATE	OUTLET_STATE_CK	Check or NN	State In ('AL','AK','AZ','AR','CA','CO','CT','DE','FL','GA','HI','ID','IL','IN',	OUTLET	STATE
OUTLET	ZIPCODE					
OUTLET	PHONE	OUTLET_PHONE_CK	Check or NN	REGEXP_LIKE(Phone, '^([0-9]{3}-[0-9]{4}-[0-9]{4})$')	OUTLET	PHONE
OUTLET	MANAGERNO	OUTLET_MANAGERNO_FK	Foreign Key		OUTLET	MANAGERNO
RAGREEMENT	RENTALNO	RAGREEMENT_RENTALNO_PK	Primary Key		RAGREEMENT	RENTALNO

RAGREEMENT	STARTDATE					
RAGREEMENT	RETURNDATE					
RAGREEMENT	MILEAGEBEFORE	RAGREEMENT_MILEAGE_CK	Check or NN	MileageAfter > MileageBefore	RAGREEMENT	MILEAGEBEFORE
RAGREEMENT	MILEAGEAFTER	RAGREEMENT_MILEAGE_CK	Check or NN	MileageAfter > MileageBefore	RAGREEMENT	MILEAGEAFTER
RAGREEMENT	INSURANCETYPE					
RAGREEMENT	CLIENTNO	RAGREEMENT_CLIENTNO_FK	Foreign Key		RAGREEMENT	CLIENTNO
RAGREEMENT	LICENSENO	RAGREEMENT_LICENSENO_FK	Foreign Key		RAGREEMENT	LICENSENO
VEHICLE	LICENSENO	VEHICLE_LICENSENO_PK	Primary Key		VEHICLE	LICENSENO
VEHICLE	MAKE					
VEHICLE	MODEL					
VEHICLE	COLOR					
VEHICLE	YEAR	VEHICLE_YEAR_CK	Check or NN	2020-TO_CHAR(year, 'YYYY')<10	VEHICLE	YEAR
VEHICLE	NODOORS					
VEHICLE	CAPACITY					
VEHICLE	DAILYRATE					
VEHICLE	INSPECTIONDATE					
VEHICLE	OUTNO	VEHICLE_OUTNO_FK	Foreign Key		VEHICLE	OUTNO

54 rows selected.