Script#1: Create Table Statements

```
DROP TABLE FAULTREPORT;

DROP TABLE RAGREEMENT;

DROP TABLE VEHICLE;

DROP TABLE CLIENT;

ALTER TABLE OUTLET

DROP CONSTRAINT OUTLET_ManagerNo_FK;

ALTER TABLE EMPLOYEE

DROP CONSTRAINT EMPLOYEE_Super_No_FK;

DROP TABLE EMPLOYEE;

DROP TABLE OUTLET;
```

1. Table CLIENT

Additional Check Constraint： Client Email Format, Web Address Format

```
CREATE TABLE CLIENT
(clientNo   NUMBER(8),
 FName      VARCHAR2(12)
            CONSTRAINT CLIENT_FName_nn NOT NULL,
 LName      VARCHAR2(12)
            CONSTRAINT CLIENT_LName_nn NOT NULL,
 Phone      NUMBER(10),
 Email      VARCHAR2(20)
            CONSTRAINT CLIENT_Email_CK
            CHECK (Email LIKE '_%@_%._%'),
 Webaddress VARCHAR2(30)
            CONSTRAINT CLIENT_Webaddress_CK
            CHECK ((SUBSTR(Webaddress,1,7)='http://') OR SUBSTR(Webaddress,1,8)='https://'),
 Street     VARCHAR2(30),
 City       VARCHAR2(20),
 State      CHAR(2),
 ZipCode    NUMBER(9),
 CONSTRAINT CLIENT_clientNo_PK
            PRIMARY KEY (clientNo));
```

2. Table EMPLOYEE

Additional Check Constraint： Employee Email Format

```
CREATE TABLE EMPLOYEE
(EmpNo    NUMBER(5),
 FName    VARCHAR2(12)
         CONSTRAINT EMPLOYEE_FName_nn NOT NULL,
 LName    VARCHAR2(12)
         CONSTRAINT EMPLOYEE_LName_nn NOT NULL,
 Position VARCHAR2(20),
 Phone    NUMBER(10),
 Email    VARCHAR2(20)
         CONSTRAINT EMPLOYEE_Email_CK
         CHECK (Email LIKE '_%@company.com'),
 DOB      DATE DEFAULT SYSDATE,
 Gender   VARCHAR2(10),
 Salary   NUMBER(8,2),
 HireDate DATE DEFAULT SYSDATE,
 OutNo    NUMBER(3),
 Super_No NUMBER(5)
         CONSTRAINT EMPLOYEE_Super_No_FK
         REFERENCES EMPLOYEE (EmpNo),
 CONSTRAINT EMPLOYEE_EmpNo_PK
           PRIMARY KEY (EmpNo));
```

3. Table OUTLET

```
CREATE TABLE OUTLET
(outNo     NUMBER(3),
 Street    VARCHAR2(30),
 City      VARCHAR2(20),
 State     CHAR(2),
 ZipCode   NUMBER(9),
```

```
 Phone      NUMBER(10),
 ManagerNo NUMBER(5)
          CONSTRAINT OUTLET_ManagerNo_FK
          REFERENCES EMPLOYEE(EmpNo),
 CONSTRAINT OUTLET_outNo_PK
           PRIMARY KEY (outNo));
```

4. Table VEHICLE

```
CREATE TABLE VEHICLE
(licenseNo      VARCHAR2(10),
 Make           VARCHAR2(15),
 Model          VARCHAR2(10),
 Color          VARCHAR2(10),
 Year           NUMBER(4),
 NoDoors        NUMBER(1),
 Capacity       NUMBER(2),
 DailyRate      NUMBER(6,2),
 InspectionDate DATE DEFAULT SYSDATE,
 outNo          NUMBER(3)
                CONSTRAINT VEHICLE_outNo_FK
                REFERENCES OUTLET (outNo),
 CONSTRAINT VEHICLE_LicenseNo_PK
           PRIMARY KEY (LicenseNo));
```

5. Table RAGREEMENT

Additional Check Constraint: StartDate < ReturnDate, MileageBefore < MileageAfter

```
CREATE TABLE RAGREEMENT
(rentalNo      NUMBER(8),
 StartDate     TIMESTAMP DEFAULT SYSDATE,
 ReturnDate    TIMESTAMP DEFAULT SYSDATE,
 MileageBefore NUMBER(8,2),
```

```
 MileageAfter  NUMBER(8,2),
 InsuranceType VARCHAR2(10),
 ClientNo      NUMBER(8)
               CONSTRAINT RAGREEMENT_clientNo_FK
               REFERENCES CLIENT (clientNo),
 licenseNo     VARCHAR2(10)
               CONSTRAINT RAGREEMENT_licenseNo_FK
               REFERENCES VEHICLE (licenseNo),
CONSTRAINT RAGREEMENT_ReturnDate_CK
    CHECK (StartDate < ReturnDate),
CONSTRAINT RAGREEMENT_MileageAfter_CK
    CHECK (MileageBefore < MileageAfter),
 CONSTRAINT RAGREEMENT_RentalNo_PK
          PRIMARY KEY (RentalNo));
```

6. Table FAULTREPORT

```
CREATE TABLE FAULTREPORT
(ReportNum   NUMBER(8),
 DateChecked TIMESTAMP DEFAULT SYSDATE,
 Comments    VARCHAR2(50),
 EmpNo       NUMBER(5)
             CONSTRAINT FAULTREPORT_EmpNo_FK
             REFERENCES EMPLOYEE (EmpNo),
 LicenseNo   VARCHAR2(10)
             CONSTRAINT FAULTREPORT_LicenseNo_FK
             REFERENCES VEHICLE (LicenseNo),
 RentalNo    Number(8)
             CONSTRAINT FAULTREPORT_RentalNo_FK
             REFERENCES RAGREEMENT (RentalNo),
 CONSTRAINT FAULTREPORT_ReportNum_PK
          PRIMARY KEY (ReportNum));
```

7. Create the missing constraint

```
ALTER TABLE EMPLOYEE
ADD CONSTRAINT EMPLOYEE_OutNo_FK
    FOREIGN KEY (OutNo)
    REFERENCES OUTLET (outNo);
```

Script#2: Insert Data

1. Insert into table OUTLET

```
INSERT INTO OUTLET VALUES (1, 'Alquire', 'Hayward', 'CA', 94544, 5551235978, NULL);
INSERT INTO OUTLET VALUES (2, 'Forbs', 'Pittsburgh', 'PA', 15217, 5551231234, NULL);
INSERT INTO OUTLET VALUES (3, 'West Street', 'New York', 'NY', 55555, 5553455678, NULL);
INSERT INTO OUTLET VALUES (4, 'Nowhere', 'Ohio City', 'OH', 15156, 5559876543, NULL);
INSERT INTO OUTLET VALUES (5, '23 Oak Ln', 'Pittsburgh', 'PA', 15210, 4125762329, NULL);
INSERT INTO OUTLET VALUES (6, '767 View Dr', 'Rockville', 'MD', 20847, 2403140558, NULL);
INSERT INTO OUTLET VALUES (7, '987 Count Dr', 'Cleveland', 'OH', 44101, 2169243850, NULL);
INSERT INTO OUTLET VALUES (8, '3766 Blue Way', 'Arlington', 'VA', 22201, 8176533663, NULL);
```

2. Insert into table EMPLOYEE

```
INSERT INTO EMPLOYEE
VALUES (1, 'Thomas', 'Thompson', 'Manager', 5551235978, 'tcanch@company.com', '14-Apr-1987', 'Male', 70000, '1-JAN-20', 1, NULL);
INSERT INTO EMPLOYEE
VALUES (2, 'Sarah', 'Wilkins', 'Manager', 5551231234, 'swilk@company.com', '12-May-1995', 'Female', 60000, '15-JAN-20', 2, 1);
INSERT INTO EMPLOYEE
VALUES (3, 'Avery', 'Austin', 'Manager', 5553455678, 'aaust@company.com', '17-Jun-1996', 'Male', 60000, '1-Feb-20', 3, 1);
INSERT INTO EMPLOYEE
VALUES (4, 'James', 'Eherts', 'Manager', 5559876543, 'jeherts@company.com', '15-Sep-1997', 'Male', 60000, '20-JAN-20', 4, 1);
INSERT INTO EMPLOYEE
VALUES (5, 'Samantha', 'West', 'Mechanic', 5551112222, 'swest@company.com', '11-May-1995', 'Female', 48000, '15-JAN-20', 1, 1);
INSERT INTO EMPLOYEE
VALUES (6, 'Gerald', 'Shoemaker', 'Mechanic', 5551113333, 'gshoe@company.com', '11-Apr-20', 'Male', 48000, '17-May-21', 2, 2);
INSERT INTO EMPLOYEE
VALUES (7, 'Adam', 'Smith', 'Mechanic', 5551114444, 'asmith@company.com', '21-Jun-1992', 'Male', 48000, '15-JAN-21', 3, 3);
```

```
INSERT INTO EMPLOYEE
VALUES (8, 'John', 'Smith', 'Mechanic', 5551115555, 'jsmith@company.com', '11-May-1995', 'Male', 48000, '3-Apr-21', 4, 4);
INSERT INTO EMPLOYEE
VALUES (9, 'Fred', 'Johnson', 'Staff', 4129572382, 'fred1112@company.com', '12-Nov-1996', 'Male', 45000, '17-Oct-20', 5, 5);
INSERT INTO EMPLOYEE
VALUES (10, 'John', 'Holin', 'Staff', 3104240238, 'jh2@company.com', '28-Jul-1998', 'Male', 45000, '15-Aug-21', 6, 5);
INSERT INTO EMPLOYEE
VALUES (11, 'Anna', 'Tavernier', 'Staff', 5182393230, 'annat@company.com', '08-Mar-1998', 'Female', 45000, '07-Jul-21', 7, 6);
INSERT INTO EMPLOYEE
VALUES (12, 'Emma', 'Mayo', 'Staff', 2089431234, 'emma2@company.com', '18-Sep-1997', 'Female', 45000, '08-May-21', 8, 6);
INSERT INTO EMPLOYEE
VALUES (13, 'Emily', 'Carey', 'Staff', 4123425342, 'ec@company.com', '25-Apr-1998', 'Female', 45000, '28-May-22', 6, 7);
INSERT INTO EMPLOYEE
VALUES (14, 'Chris', 'Martin', 'Staff', 2089102234, 'chris1@company.com', '29-Jun-1997', 'Male', 45000, '30-Mar-22', 7, 8);
```

3. Update ManagerNo in table OUTLET

```
UPDATE OUTLET
SET ManagerNo = 1
WHERE outNo = 1;


UPDATE OUTLET
SET ManagerNo = 2
WHERE outNo = 2;


UPDATE OUTLET
SET ManagerNo = 3
WHERE outNo = 3;


UPDATE OUTLET
SET ManagerNo = 4
WHERE outNo = 4;


UPDATE OUTLET
```

```
SET ManagerNo = 1
WHERE outNo = 5;


UPDATE OUTLET
SET ManagerNo = 2
WHERE outNo = 6;


UPDATE OUTLET
SET ManagerNo = 5
WHERE outNo = 7;


UPDATE OUTLET
SET ManagerNo = 6
WHERE outNo = 8;
```

4. Insert into table VEHICLE

```
INSERT INTO VEHICLE VALUES ('ABC1234', 'Toyota', 'Prius', 'Black', 2003, 4, 5, 100.12, '19-Sep-22', 1);
INSERT INTO VEHICLE VALUES ('ABC1235', 'Honda', 'Covic', 'White', 2008, 4, 5, 150.00, '23-Oct-22', 1);
INSERT INTO VEHICLE VALUES ('XYZ1234', 'Toyota', 'Prius', 'Black', 2003, 4, 5, 100.12, '23-Nov-22', 2);
INSERT INTO VEHICLE VALUES ('XYZ1235', 'Honda', 'Covic', 'White', 2008, 4, 5, 150.00, '23-Nov-22', 2);
INSERT INTO VEHICLE VALUES ('ABC9876', 'Toyota', 'Prius', 'Black', 2003, 4, 5, 100.12, '18-May-22', 3);
INSERT INTO VEHICLE VALUES ('ABC9877', 'Honda', 'Covic', 'White', 2008, 4, 5, 150.00, '12-Jul-22', 3);
INSERT INTO VEHICLE VALUES ('XYZ9876', 'Toyota', 'Prius', 'Black', 2003, 4, 5, 100.12, '01-Dec-22', 4);
INSERT INTO VEHICLE VALUES ('XYZ9877', 'Honda', 'Covic', 'White', 2008, 4, 5, 150.00, '15-Sep-22', 4);
INSERT INTO VEHICLE VALUES ('UVW1000', 'Ford', 'Ecosport', 'Blue', 2021, 4, 5, 60.10, '02-Nov-22', 5);
INSERT INTO VEHICLE VALUES ('UVW1001', 'Nissan', 'Sentra', 'Silver', 2019, 4, 5, 37.71, '15-Feb-22', 5);
INSERT INTO VEHICLE VALUES ('UVW1002', 'Toyota', 'Camry', 'Black', 2020, 4, 5, 40.43, '02-Oct-22', 6);
INSERT INTO VEHICLE VALUES ('UVW1003', 'Chevrolet', 'Express', 'White', 2022, 3, 12, 106.00, '21-Nov-22', 7);
INSERT INTO VEHICLE VALUES ('UVW1004', 'Chrysler', 'Pacifica', 'Red', 2021, 4, 8, 60.10, '30-Jul-22', 7);
INSERT INTO VEHICLE VALUES ('UVW1005', 'Nissan', 'Kick', 'White', 2017, 4, 5, 37.71, '05-Oct-22', 8);
```

5. Insert into table CLIENT

```
INSERT INTO CLIENT
```

```sql
VALUES (1, 'Sam', 'Purdue', 5559995555, 'spurdue@gmail.com', 'http://www.google.com', '51E', 'Norwich', 'CA', 55555);
INSERT INTO CLIENT
VALUES (2, 'Amanda', 'Hall', 5559994444, 'ahall@gmail.com', 'https://www.government.gov', '98W', 'New York', 'NY', 55566);
INSERT INTO CLIENT
VALUES (3, 'Sam', 'Dobler', 5559993333, 'sdobler@gmail.com', 'http://www.ngo.org', 'Wilkins', 'Pittsburgh', 'PA', 55577);
INSERT INTO CLIENT
VALUES (4, 'Jonathan', 'DeWitt', 5559992222, 'jdw@gmail.com', 'https://www.space.org', 'Industrial', 'Hayward', 'CA', 94544);
INSERT INTO CLIENT
VALUES (5, 'Alison', 'Hall', 5559991111, 'ahall2@gmail.com', 'https://www.government.gov', 'Woodwind', 'Nowhere', 'OH', 15156);
INSERT INTO CLIENT
VALUES (6, 'Thomas', 'Dwller', 5554449999, 'tw@gmail.com', 'http://www.google.com', 'Forbes', 'Pittsburgh', 'PA', 15216);
INSERT INTO CLIENT
VALUES (7, 'Dwayne', 'Johnson', 5556669999, 'drock@gmail.com', Null, 'Woodwind', 'Nowhere', 'OH', 15156);
INSERT INTO CLIENT
VALUES (21, 'Jessica', 'Zhang', 4129371203, 'jessi@gmail.com', 'http://www.heinz.cmu.edu', '5000 Forbes', 'Pittsburgh', 'PA', 15213);
INSERT INTO CLIENT
VALUES (22, 'Jason', 'Brown', 3120730449, 'jsbrown@gmail.com', 'http://www.chicago.gov', '9501 S King Dr', 'Chicago', 'IL', 60628);
INSERT INTO CLIENT
VALUES (23, 'Bonita', 'Morales', 2089964356, 'boni@outlook.com', 'http://www.apple.com', '69821 South Avenue', 'Boise', 'ID', 83707);
INSERT INTO CLIENT
VALUES (24, 'Ryan', 'Thompson', 3104588411, 'ryan2@outlook.com', 'http://thenew.org', 'P.O. BOX 9835', 'Santa Monica', 'CA', 90404);
INSERT INTO CLIENT
VALUES (25, 'Meshia', 'Cruz', 5184588676, 'meshia@gmail.com', null, '82 Dirt Road', 'Albany', 'NY', 12211);
INSERT INTO CLIENT
VALUES (26, 'Thomas', 'Pierson', 4123722977, 'thomas1@outlook.com', 'http://fertilityspace.io', '7477 Elm St', 'Monroeville', 'PA', 15146);
```

6. Insert into table RAGREEMENT
```sql
INSERT INTO RAGREEMENT VALUES (1, '01-Nov-22 09:22:09 AM', '12-Nov-22 11:55:32 AM', 0, 300, 'Full', 1, 'ABC1234');
INSERT INTO RAGREEMENT VALUES (2, '13-Nov-22 12:21:24 PM', '21-Nov-22 08:59:42 PM', 300, 1600, 'Full', 4, 'ABC1234');
INSERT INTO RAGREEMENT VALUES (3, '01-Jun-22 10:23:44 AM', '23-Jul-22 09:25:45 PM', 200, 1800, 'Full', 2, 'ABC9876');
INSERT INTO RAGREEMENT VALUES (4, '01-Nov-22 02:19:29 PM', '18-Nov-22 03:23:45 PM', 2200, 2500, 'Full', 2, 'ABC9877');
INSERT INTO RAGREEMENT VALUES (5, '01-Mar-22 08:32:53 AM', '15-Apr-22 01:11:32 PM', 500, 700, 'Partial', 3, 'XYZ1234');
INSERT INTO RAGREEMENT VALUES (6, '12-Sep-22 10:52:24 AM', '13-Sep-22 06:30:23 PM', 200, 220, 'Full', 5, 'XYZ9876');
```

```
INSERT INTO RAGREEMENT VALUES (7, '02-May-22 04:11:35 PM', '08-May-22 09:15:48 AM', 400, 450, 'Partial', 6, 'XYZ9877');
INSERT INTO RAGREEMENT VALUES (8, '01-Aug-22 05:12:47 PM', '23-Aug-22 11:23:54 AM', 1800, 2100, 'Full', 2, 'ABC9876');
INSERT INTO RAGREEMENT VALUES (9, '02-May-22 09:12:52 AM', '05-May-22 03:25:27 PM', 0, 200, 'Partial', 6, 'XYZ9876');
INSERT INTO RAGREEMENT VALUES (10, '07-Apr-22 02:12:43 PM', '09-Apr-22 04:14:22 PM', 0, 200, 'Partial', 2, 'ABC9877');
INSERT INTO RAGREEMENT VALUES (11, '01-Jan-22 11:22:31 AM', '27-Jan-22 06:45:23 PM', 0, 400, 'Partial', 7, 'XYZ9877');
INSERT INTO RAGREEMENT VALUES (12, '05-Jan-22 10:47:12 AM', '15-Feb-22 12:14:55 PM', 10152, 12652, 'Full', 22, 'UVW1001');
INSERT INTO RAGREEMENT VALUES (13, '23-May-22 02:15:35 PM', '01-Jun-22 03:24:45 PM', 27899, 30870, 'Liability', 23, 'UVW1002');
INSERT INTO RAGREEMENT VALUES (14, '22-Jul-22 01:15:53 PM', '29-Jul-22 02:15:32 PM', 5990, 7340, 'Full', 25, 'UVW1004');
INSERT INTO RAGREEMENT VALUES (15, '18-Sep-22 04:32:45 PM', '30-Sep-22 10:08:35 AM', 30870, 34865, 'Collision', 24, 'UVW1002');
INSERT INTO RAGREEMENT VALUES (16, '30-Sep-22 05:33:25 PM', '05-Oct-22 10:11:43 AM', 44250, 44400, 'Collision', 26, 'UVW1005');
INSERT INTO RAGREEMENT VALUES (17, '08-Oct-22 03:23:40 PM', '10-Oct-22 09:05:27 AM', 5211, 5389, 'Liability', 25, 'UVW1000');
INSERT INTO RAGREEMENT VALUES (18, '01-Nov-22 12:13:25 PM', '01-Nov-22 07:30:44 PM', 5389, 5476, 'Collision', 21, 'UVW1000');
INSERT INTO RAGREEMENT VALUES (19, '15-Nov-22 09:10:37 AM', '20-Nov-22 06:10:33 PM', 4395, 5545, 'Liability', 21, 'UVW1003');
```

7. **Insert into table FAULTREPORT**

```
INSERT INTO FAULTREPORT VALUES (1, '24-Jul-22 10:32:54 AM', 'Windshield wipers replaced', 7, 'ABC9876',3);
INSERT INTO FAULTREPORT VALUES (2, '25-Aug-22 10:13:22 AM', 'Windshield wiper motor replaced', 7, 'ABC9876',8);
INSERT INTO FAULTREPORT VALUES (3, '14-Sep-22 09:54:19 AM', 'Breaks replaced', 8, 'XYZ9876', 6);
INSERT INTO FAULTREPORT VALUES (4, '09-May-22 02:25:12 PM', 'Lights replaced', 8, 'XYZ9877', 7);
INSERT INTO FAULTREPORT VALUES (5, '23-Apr-22 11:23:45 AM', 'Break fluid replaced', 6, 'XYZ1234', 5);
INSERT INTO FAULTREPORT VALUES (6, '10-May-22 04:23:52 PM', 'Breaks replaced', 8, 'XYZ9877', 9);
INSERT INTO FAULTREPORT VALUES (7, '15-Feb-22 04:40:23 PM', 'One car door has minor scratch', 9, 'UVW1001', 12);
INSERT INTO FAULTREPORT VALUES (8, '02-Jun-22 01:55:05 PM', 'Warning lights do not work', 10, 'UVW1002', 13);
INSERT INTO FAULTREPORT VALUES (9, '05-Oct-22 03:13:15 PM', 'Wiper blade fail to work', 11, 'UVW1005', 16);
INSERT INTO FAULTREPORT VALUES (10, '10-Oct-22 01:12:14 PM', 'One car window has minor scratch', 12, 'UVW1000', 17);
INSERT INTO FAULTREPORT VALUES (11, '02-Nov-22 12:32:41 PM', 'The left rear tire has a slow leak', 12, 'UVW1000', 18);
```

Table Contents

1. EMPLOYEE

EMPNO	FNAME	LNAME	POSITION	PHONE	EMAIL	DOB	GENDER	SALARY	HIREDATE	OUTNO	SUPER_NO
1	Thomas	Thompson	Manager	5551235978	tcanch@company.com	14-APR-87	Male	70000	01-JAN-20	1	
2	Sarah	Wilkins	Manager	5551231234	swilk@company.com	12-MAY-95	Female	60000	15-JAN-20	2	1
3	Avery	Austin	Manager	5553455678	aaust@company.com	17-JUN-96	Male	60000	01-FEB-20	3	1
4	James	Eherts	Manager	5559876543	jeherts@company.com	15-SEP-97	Male	60000	20-JAN-20	4	1
5	Samantha	West	Mechanic	5551112222	swest@company.com	11-MAY-95	Female	48000	15-JAN-20	1	1
6	Gerald	Shoemaker	Mechanic	5551113333	gshoe@company.com	11-APR-20	Male	48000	17-MAY-21	2	2
7	Adam	Smith	Mechanic	5551114444	asmith@company.com	21-JUN-92	Male	48000	15-JAN-21	3	3
8	John	Smith	Mechanic	5551115555	jsmith@company.com	11-MAY-95	Male	48000	03-APR-21	4	4
9	Fred	Johnson	Staff	4129572382	fred1112@company.com	12-NOV-96	Male	45000	17-OCT-20	5	5
10	John	Holin	Staff	3104240238	jh2@company.com	28-JUL-98	Male	45000	15-AUG-21	6	5
11	Anna	Tavernier	Staff	5182393230	annat@company.com	08-MAR-98	Female	45000	07-JUL-21	7	6
12	Emma	Mayo	Staff	2089431234	emma2@company.com	18-SEP-97	Female	45000	08-MAY-21	8	6
13	Emily	Carey	Staff	4123425342	ec@company.com	25-APR-98	Female	45000	28-MAY-22	6	7
14	Chris	Martin	Staff	2089102234	chris1@company.com	29-JUN-97	Male	45000	30-MAR-22	7	8

2. FAULTREPORT

REPORTNUM	DATECHECKED	COMMENTS	EMPNO	LICENSENO	RENTALNO
1	24-JUL-22 10.32.54.000000 AM	Windshield wipers replaced	7	ABC9876	3
2	25-AUG-22 10.13.22.000000 AM	Windshield wiper motor replaced	7	ABC9876	8
3	14-SEP-22 09.54.19.000000 AM	Breaks replaced	8	XYZ9876	6
4	09-MAY-22 02.25.12.000000 PM	Lights replaced	8	XYZ9877	7
5	23-APR-22 11.23.45.000000 AM	Break fluid replaced	6	XYZ1234	5
6	10-MAY-22 04.23.52.000000 PM	Breaks replaced	8	XYZ9877	9
7	15-FEB-22 04.40.23.000000 PM	One car door has minor scratch	9	UVW1001	12
8	02-JUN-22 01.55.05.000000 PM	Warning lights do not work	10	UVW1002	13
9	05-OCT-22 03.13.15.000000 PM	Wiper blade fail to work	11	UVW1005	16
10	10-OCT-22 01.12.14.000000 PM	One car window has minor scratch	12	UVW1000	17
11	02-NOV-22 12.32.41.000000 PM	The left rear tire has a slow leak	12	UVW1000	18

3. OUTLET

OUTNO	STREET	CITY	STATE	ZIPCODE	PHONE	MANAGERNO
1	Alquire	Hayward	CA	94544	5551235978	1
2	Forbs	Pittsburgh	PA	15217	5551231234	2
3	West Street	New York	NY	55555	5553455678	3
4	Nowhere	Ohio City	OH	15156	5559876543	4
5	23 Oak Ln	Pittsburgh	PA	15210	4125762329	1
6	767 View Dr	Rockville	MD	20847	2403140558	2
7	987 Count Dr	Cleveland	OH	44101	2169243850	5
8	3766 Blue Way	Arlington	VA	22201	8176533663	6

4. VEHICLE

LICENSENO	MAKE	MODEL	COLOR	YEAR	NODOORS	CAPACITY	DAILYRATE	INSPECTIONDATE	OUTNO
ABC1234	Toyota	Prius	Black	2003	4	5	100.12	19-SEP-22	1
ABC1235	Honda	Covic	White	2008	4	5	150	23-OCT-22	1
XYZ1234	Toyota	Prius	Black	2003	4	5	100.12	23-NOV-22	2
XYZ1235	Honda	Covic	White	2008	4	5	150	23-NOV-22	2
ABC9876	Toyota	Prius	Black	2003	4	5	100.12	18-MAY-22	3
ABC9877	Honda	Covic	White	2008	4	5	150	12-JUL-22	3
XYZ9876	Toyota	Prius	Black	2003	4	5	100.12	01-DEC-22	4
XYZ9877	Honda	Covic	White	2008	4	5	150	15-SEP-22	4
UVW1000	Ford	Ecosport	Blue	2021	4	5	60.1	02-NOV-22	5
UVW1001	Nissan	Sentra	Silver	2019	4	5	37.71	15-FEB-22	5
UVW1002	Toyota	Camry	Black	2020	4	5	40.43	02-OCT-22	6
UVW1003	Chevrolet	Express	White	2022	3	12	106	21-NOV-22	7
UVW1004	Chrysler	Pacifica	Red	2021	4	8	60.1	30-JUL-22	7
UVW1005	Nissan	Kick	White	2017	4	5	37.71	05-OCT-22	8

5. CLIENT

CLIENTNO	FNAME	LNAME	PHONE	EMAIL	WEBADDRESS	STREET	CITY	STATE	ZIPCODE

1	Sam	Purdue	5559995555	spurdue@gmail.com	http://www.google.com	51E	Norwich	CA	55555
2	Amanda	Hall	5559994444	ahall@gmail.com	https://www.government.gov	98W	New York	NY	55566
3	Sam	Dobler	5559993333	sdobler@gmail.com	http://www.ngo.org	Wilkins	Pittsburgh	PA	55577
4	Jonathan	DeWitt	5559992222	jdw@gmail.com	https://www.space.org	Industrial	Hayward	CA	94544
5	Alison	Hall	5559991111	ahall2@gmail.com	https://www.government.gov	Woodwind	Nowhere	OH	15156
6	Thomas	Dwller	5554449999	tw@gmail.com	http://www.google.com	Forbes	Pittsburgh	PA	15216
7	Dwayne	Johnson	5556669999	drock@gmail.com		Woodwind	Nowhere	OH	15156
21	Jessica	Zhang	4129371203	jessi@gmail.com	http://www.heinz.cmu.edu	5000 Forbes	Pittsburgh	PA	15213
22	Jason	Brown	3120730449	jsbrown@gmail.com	http://www.chicago.gov	9501 S King Dr	Chicago	IL	60628
23	Bonita	Morales	2089964356	boni@outlook.com	http://www.apple.com	69821 South Avenue	Boise	ID	83707
24	Ryan	Thompson	3104588411	ryan2@outlook.com	http://thenew.org	P.O. BOX 9835	Santa Monica	CA	90404
25	Meshia	Cruz	5184588676	meshia@gmail.com		82 Dirt Road	Albany	NY	12211
26	Thomas	Pierson	4123722977	thomas1@outlook.com	http://fertilityspace.io	7477 Elm St	Monroeville	PA	15146

6. RAGREEMENT

RENTALNO	STARTDATE	RETURNDATE	MILEAGEBEFORE	MILEAGEAFTER	INSURANCETYPE	CLIENTNO	LICENSENO
1	01-NOV-22 09.22.09.000000 AM	12-NOV-22 11.55.32.000000 AM	0	300	Full	1	ABC1234
2	13-NOV-22 12.21.24.000000 PM	21-NOV-22 08.59.42.000000 PM	300	1600	Full	4	ABC1234
3	01-JUN-22 10.23.44.000000 AM	23-JUL-22 09.25.45.000000 PM	200	1800	Full	2	ABC9876
4	01-NOV-22 02.19.29.000000 PM	18-NOV-22 03.23.45.000000 PM	2200	2500	Full	2	ABC9877
5	01-MAR-22 08.32.53.000000 AM	15-APR-22 01.11.32.000000 PM	500	700	Partial	3	XYZ1234
6	12-SEP-22 10.52.24.000000 AM	13-SEP-22 06.30.23.000000 PM	200	220	Full	5	XYZ9876
7	02-MAY-22 04.11.35.000000 PM	08-MAY-22 09.15.48.000000 AM	400	450	Partial	6	XYZ9877
8	01-AUG-22 05.12.47.000000 PM	23-AUG-22 11.23.54.000000 AM	1800	2100	Full	2	ABC9876
9	02-MAY-22 09.12.52.000000 AM	05-MAY-22 03.25.27.000000 PM	0	200	Partial	6	XYZ9876
10	07-APR-22 02.12.43.000000 PM	09-APR-22 04.14.22.000000 PM	0	200	Partial	2	ABC9877
11	01-JAN-22 11.22.31.000000 AM	27-JAN-22 06.45.23.000000 PM	0	400	Partial	7	XYZ9877
12	05-JAN-22 10.47.12.000000 AM	15-FEB-22 12.14.55.000000 PM	10152	12652	Full	22	UVW1001
13	23-MAY-22 02.15.35.000000 PM	01-JUN-22 03.24.45.000000 PM	27899	30870	Liability	23	UVW1002
14	22-JUL-22 01.15.53.000000 PM	29-JUL-22 02.15.32.000000 PM	5990	7340	Full	25	UVW1004
15	18-SEP-22 04.32.45.000000 PM	30-SEP-22 10.08.35.000000 AM	30870	34865	Collision	24	UVW1002
16	30-SEP-22 05.33.25.000000 PM	05-OCT-22 10.11.43.000000 AM	44250	44400	Collision	26	UVW1005

```
17 08-OCT-22 03.23.40.000000 PM    10-OCT-22 09.05.27.000000 AM         5211         5389 Liability                    25 UVW1000
18 01-NOV-22 12.13.25.000000 PM    01-NOV-22 07.30.44.000000 PM         5389         5476 Collision                    21 UVW1000
19 15-NOV-22 09.10.37.000000 AM    20-NOV-22 06.10.33.000000 PM         4395         5545 Liability                    21 UVW1003
```

SQL Queries

Assumption: When calculating the revenue, we assume that the company calculates how many days there are between start date and return date. If the gap is more than D days but less than D+1 days, then still charge customers for D+1 days.

```
SET LINESIZE 200;
SET PAGESIZE 50;
```

Q1

```
SQL> COLUMN StartDate format A30
SQL> COLUMN ReturnDate format A30
SQL> COLUMN DateChecked format A30
SQL> select RentalNo, StartDate, ReturnDate, VEHICLE.LicenseNo, outNo, Make, Model, Year,
  2          nvl2(DateChecked,to_char(DateChecked), '-------') as DateChecked
  3  from    RAGREEMENT join VEHICLE on VEHICLE.LicenseNo = RAGREEMENT.LicenseNo
  4                    left outer join FAULTREPORT using(RentalNo)
  5  where extract(month from StartDate) = extract(month from sysdate) - 1
  6  and   extract(year from StartDate) = extract(year from sysdate);


  RENTALNO STARTDATE                      RETURNDATE                     LICENSENO  OUTNO MAKE           MODEL      YEAR DATECHECKED
---------- ------------------------------ ------------------------------ ---------- ---------- -------------- ---------- ---------- ------------------------------
         1 01-NOV-22 09.22.09.000000 AM   12-NOV-22 11.55.32.000000 AM   ABC1234         1 Toyota         Prius      2003 -------
         2 13-NOV-22 12.21.24.000000 PM   21-NOV-22 08.59.42.000000 PM   ABC1234         1 Toyota         Prius      2003 -------
         4 01-NOV-22 02.19.29.000000 PM   18-NOV-22 03.23.45.000000 PM   ABC9877         3 Honda          Covic      2008 -------
        18 01-NOV-22 12.13.25.000000 PM   01-NOV-22 07.30.44.000000 PM   UVW1000         5 Ford           Ecosport   2021 02-NOV-22 12.32.41.000000 PM
        19 15-NOV-22 09.10.37.000000 AM   20-NOV-22 06.10.33.000000 PM   UVW1003         7 Chevrolet      Express    2022 -------
```

Q2

```sql
SQL> select to_char(outNo) as outNo, July, August, September, July + August + September as "Outlet Total"
  2  from    (select outNo, RentalNo, extract(month from StartDate) as StartMonth
  3            from    RAGREEMENT join VEHICLE using (LicenseNo)
  4            where EXTRACT(YEAR FROM StartDate)= EXTRACT(YEAR FROM sysdate))
  5  pivot (count(RentalNo) for StartMonth in (7 as July, 8 as August, 9 as September))
  6  union
  7  select 'Month Total', July, August, September, July + August + September
  8  from    (select RentalNo, extract(month from StartDate) as StartMonth
  9            from    RAGREEMENT
 10            where EXTRACT(YEAR FROM StartDate)= EXTRACT(YEAR FROM sysdate))
 11  pivot (count(RentalNo) for StartMonth in (7 as July, 8 as August, 9 as September))
 12  ORDER BY outNo;
```

OUTNO	JULY	AUGUST	SEPTEMBER	Outlet Total
1	0	0	0	0
2	0	0	0	0
3	0	1	0	1
4	0	0	1	1
5	0	0	0	0
6	0	0	1	1
7	1	0	0	1
8	0	0	1	1
Month Total	1	1	3	5

Q3

```sql
SQL> select VEHICLE.LicenseNo, Make, Model, extract(year from sysdate) - Year as Age,
  2          sum(MileageAfter - MileageBefore) as MilesDriven, max(MileageAfter) as CurrentReading,
  3          count(ReportNum) as FaultReports#
  4  from    VEHICLE join RAGREEMENT           on RAGREEMENT.LicenseNo = VEHICLE.LicenseNo
  5                  left outer join FAULTREPORT on FAULTREPORT.RentalNo = RAGREEMENT.RentalNo
  6  where extract(year from sysdate) - Year >= 5
```

```
  7  group by VEHICLE.LicenseNo, Make, Model, Year;


LICENSENO  MAKE             MODEL            AGE MILESDRIVEN CURRENTREADING FAULTREPORTS#
---------- ---------------- ---------- ---------- ----------- -------------- -------------
ABC9876    Toyota           Prius              19        1900           2100             2
XYZ9876    Toyota           Prius              19         220            220             2
XYZ9877    Honda            Covic              14         450            450             1
XYZ1234    Toyota           Prius              19         200            700             1
UVW1005    Nissan           Kick                5         150          44400             1
ABC1234    Toyota           Prius              19        1600           1600             0
ABC9877    Honda            Covic              14         500           2500             0
```

Q4
```
column quarter format A10
column FaultProb format A10
select Quarter, Rank() over(partition by Quarter order by Fault nulls last) as rank,
       Make, "# Rentals", decode(Fault, null, 'No Rental', to_char(Fault,'999') || '%') as FaultProb
from
(select b as Quarter,
        T2.Make,
        cast(decode(count(T1.RentalNo), 0, null, 100*count(ReportNum)/count(T1.RentalNo)) AS DECIMAL(4,0)) as Fault,
       count(T1.RentalNo) as "# Rentals"
from
(select case when extract(month from StartDate) in (1,2,3) then 'Q1'
             when extract(month from StartDate) in (4,5,6) then 'Q2'
             when extract(month from StartDate) in (7,8,9) then 'Q3'
             when extract(month from StartDate) in (10,11,12) then 'Q4'
             end as a,
        Make,
        ReportNum,
        RAGREEMENT.RentalNo
from    RAGREEMENT left outer join FAULTREPORT on FAULTREPORT.RentalNo = RAGREEMENT.RentalNo
```

```
                    join VEHICLE on VEHICLE.LicenseNo = RAGREEMENT.LicenseNo
where   extract(year from StartDate) = extract(year from sysdate)) T1
right outer join (select * from (select (case when rownum = 1 then 'Q1'
                                              when rownum = 2 then 'Q2'
                                              when rownum = 3 then 'Q3'
                                              when rownum = 4 then 'Q4' end) b
                      from dual
                      connect by rownum <=4), (select distinct make from vehicle)) T2 ON a=b AND T1.make = T2.make
group by T2.Make, b)
ORDER BY Quarter, Fault nulls last;
```

QUARTER	RANK	MAKE	# Rentals	FAULTPROB
Q1	1	Honda	1	0%
Q1	2	Toyota	1	100%
Q1	2	Nissan	1	100%
Q1	4	Chrysler	0	No Rental
Q1	4	Ford	0	No Rental
Q1	4	Chevrolet	0	No Rental
Q2	1	Honda	2	50%
Q2	2	Toyota	3	100%
Q2	3	Chevrolet	0	No Rental
Q2	3	Ford	0	No Rental
Q2	3	Nissan	0	No Rental
Q2	3	Chrysler	0	No Rental
Q3	1	Chrysler	1	0%
Q3	2	Toyota	3	67%
Q3	3	Nissan	1	100%
Q3	4	Ford	0	No Rental
Q3	4	Chevrolet	0	No Rental
Q3	4	Honda	0	No Rental
Q4	1	Honda	1	0%
Q4	1	Toyota	2	0%

```
Q4                    1 Chevrolet              1    0%
Q4                    4 Ford                   2  100%
Q4                    5 Chrysler               0 No Rental
Q4                    5 Nissan                 0 No Rental
```

Q5

```
SQL> column EarningPct format A12
SQL> select Model, c "# vehicles",
  2          rank() over (order by nvl(EarningPct,0) desc) as rank,
  3          to_char(nvl(EarningPct,0),'990.99') || '%' as EarningPct
  4  from    (select Model, c , (Revenue/sum(Revenue) over())*100 as EarningPct
  5            from   (select Model, count(LicenseNo) c
  6                     from VEHICLE
  7              group by Model) T1 left outer join (select Model, sum(DailyRate * (extract(DAY from ReturnDate - StartDate)+1)) as Revenue
  8                                                   from   RAGREEMENT join VEHICLE on VEHICLE.LicenseNo = RAGREEMENT.LicenseNo
  9                                                   where extract(month from StartDate) in (7,8,9)
 10                                                   and   extract(year from StartDate) = extract(year from sysdate)
 11                                                   group by Model) T2 using (Model))
 12  order by EarningPct desc nulls last;


MODEL        # vehicles      RANK EARNINGPCT
---------- ---------- ---------- ------------
Prius               4         1   67.55%
Camry               1         2   13.64%
Pacifica            1         3   13.52%
Kick                1         4    5.30%
Sentra              1         5    0.00%
Covic               4         5    0.00%
Ecosport            1         5    0.00%
Express             1         5    0.00%
```

Q6

```
SQL> column "Employee" format a30
SQL> select LEVEL, LPAD(' ', 3*(level-1)) || EMPLOYEE.EmpNo|| ' - '|| FName|| ' ' ||LName Employee,
  2         Position, OUTLET.Street, nvl(x,0) "Fault Reports#"
  3  from   EMPLOYEE left outer join (select count(ReportNum) x, EmpNo
  4                                   from FAULTREPORT
  5                                   where extract(day from sysdate - DateChecked) + 1 <= 90
  6                                   group by (EmpNo)) T on EMPLOYEE.EmpNo = T.EmpNo
  7             join OUTLET on  OUTLET.outNo = EMPLOYEE.OutNo
  8  start with EMPLOYEE.EmpNo = 1
  9  connect by prior EMPLOYEE.EmpNo = Super_No;
```

LEVEL	EMPLOYEE	POSITION	STREET	Fault Reports#
1	1 - Thomas Thompson	Manager	Alquire	0
2	2 - Sarah Wilkins	Manager	Forbs	0
3	6 - Gerald Shoemaker	Mechanic	Forbs	0
4	11 - Anna Tavernier	Staff	987 Count Dr	1
4	12 - Emma Mayo	Staff	3766 Blue Way	2
2	3 - Avery Austin	Manager	West Street	0
3	7 - Adam Smith	Mechanic	West Street	0
4	13 - Emily Carey	Staff	767 View Dr	0
2	4 - James Eherts	Manager	Nowhere	0
3	8 - John Smith	Mechanic	Nowhere	1
4	14 - Chris Martin	Staff	987 Count Dr	0
2	5 - Samantha West	Mechanic	Alquire	0
3	9 - Fred Johnson	Staff	23 Oak Ln	0
3	10 - John Holin	Staff	767 View Dr	0

Q7
```
SQL> column "Rentals Per Employee 60" format 990.99
SQL> select t1.outNo, Vehicle#, nvl(Rental60#, 0) as Rental60#,
  2         nvl2(DistPerRental60, to_char(DistPerRental60), 'No Rental') as "Distance Per Rental 60",
```

```
  3         Employees#,
  4         nvl(Rental60#, 0) / Employees# as "Rentals Per Employee 60"
  5  from (select outNo, count(VEHICLE.LicenseNo) as Vehicle#
  6        from    OUTLET join VEHICLE using(outNo)
  7        group by outNo) t1
  8  join (select OutNo, count(EmpNo) as Employees#
  9        from    EMPLOYEE
 10        group by OutNo) t2 on t1.outNo = t2.OutNo
 11  left outer join (select outNo,
 12                        count(RentalNo) as Rental60#,
 13                        avg(MileageAfter - MileageBefore) as DistPerRental60
 14                   from    OUTLET join VEHICLE using(outNo)
 15                            join RAGREEMENT using(LicenseNo)
 16                   where extract(day from sysdate - RAGREEMENT.StartDate) + 1 <=60
 17                   group by outNo) t3 on t3.outNo = t1.outNo
 18  ORDER BY t1.outno;
```

OUTNO	VEHICLE#	RENTAL60#	Distance Per Rental 60	EMPLOYEES#	Rentals Per Employee 60
1	2	2	800	2	1.00
2	2	0	No Rental	2	0.00
3	2	1	300	2	0.50
4	2	0	No Rental	2	0.00
5	2	2	132.5	1	2.00
6	1	0	No Rental	2	0.00
7	2	1	1150	2	0.50
8	1	0	No Rental	1	0.00

Q8

```
SQL> column client format A20
SQL> select Client, Revenue
  2  from
```

```
  3  (select RAGREEMENT.clientNo || ' - ' || FName || ' ' || LName Client,
  4          sum(DailyRate * (extract(day from (ReturnDate - StartDate))+1)) Revenue,
  5          rank() over(order by sum(DailyRate * (extract(day from (ReturnDate - StartDate))+1)) desc) as rank
  6   from RAGREEMENT, CLIENT, VEHICLE
  7   where RAGREEMENT.LicenseNo = VEHICLE.LicenseNo
  8   and   CLIENT.clientNo = RAGREEMENT.clientNo
  9   and   extract(year from StartDate) = extract(year from sysdate)
 10   group by RAGREEMENT.clientNo, FName, LName)
 11  where rank = 1;


CLIENT                 REVENUE
-------------------- ----------
2 - Amanda Hall          10659
```

Q9

```
SQL> column state format A6
SQL> column "%Customer in State" format A20
SQL> column "%Rental in State" format A20
SQL> select outno, state, nvl(a, 0) "Number of Clients",
  2          nvl(b, 0) "Number of Rentals at Location",
  3          to_char(nvl(a, 0)*100/nvl(c, 0), '990') || '%'  "%Customer in State",
  4          to_char(nvl(b, 0)*100/nvl(d, 0), '990') || '%' "%Rental in State"
  5  from    outlet left outer join
  6  (select outno, count(distinct clientno) a, count(rentalno) b
  7   from ragreement join vehicle using (licenseno)
  8                   join outlet using (outno)
  9                   join client using (clientno, state)
 10   group by outno) using(outno) left outer join
 11  (select outno, count(distinct clientno) c, count(rentalno) d
 12   from ragreement join vehicle using(licenseno)
 13                   join outlet using(outno)
 14                   join client using(clientno)
```

```
 15    group by outno) using(outno)
 16    order by 1;


      OUTNO STATE   Number of Clients Number of Rentals at Location %Customer in State    %Rental in State
---------- ------ ----------------- ----------------------------- -------------------- --------------------
         1 CA                     2                             2  100%                 100%
         2 PA                     1                             1  100%                 100%
         3 NY                     1                             4  100%                 100%
         4 OH                     2                             2   67%                  50%
         5 PA                     1                             1   33%                  33%
         6 MD                     0                             0    0%                   0%
         7 OH                     0                             0    0%                   0%
         8 VA                     0                             0    0%                   0%
```

Q10

```
SQL> select ClientType, nvl(Client#, 0) Client#, nvl(Rental#, 0) Rental#
  2  from (select
  3          (case when rownum = 1 then 'Educational Institution'
  4                when rownum = 2 then 'Government Agency'
  5                when rownum = 3 then 'Non-Profit Organization'
  6                when rownum = 4 then 'Profit Company'
  7                when rownum = 5 then 'Others'
  8                when rownum = 6 then 'Not Available' end) ClientType
  9       from dual
 10       connect by rownum <=6)
 11  left outer join
 12  (select ClientType, count(RentalNo) Rental#, count(distinct clientNo) Client#
 13  from   (select case when lower(Webaddress) like '%.edu%' then 'Educational Institution'
 14                      when lower(Webaddress) like '%.org%' then 'Government Agency'
 15                      when lower(Webaddress) like '%.gov%' then 'Non-Profit Organization'
 16                      when lower(Webaddress) like '%.com%' then 'Profit Company'
 17                      when Webaddress is not null then 'Others'
```

```
 18                       else 'Not Available' end as ClientType, RentalNo, CLIENT.clientNo
 19          from CLIENT left outer join RAGREEMENT on RAGREEMENT.clientNo = CLIENT.clientNo
 20                      and to_char(StartDate, 'Q') = to_char(sysdate, 'Q') - 1)
 21  group by ClientType) using(ClientType);


CLIENTTYPE                 CLIENT#    RENTAL#
----------------------- ---------- ----------
Non-Profit Organization       3        2
Not Available                 2        1
Government Agency             3        1
Others                        1        1
Profit Company                3        0
Educational Institution       1        0
```