

DBMS administration

Lab sheet 2

Database Schema Management: Creation, Definition, and Manipulation

The following DB will be used throughout the labs during this semester.

Consider the "Management of Mechanical Interventions" database, the relational schema of which is given below:

CUSTOMER (CUSTOMERNUMBER, CIV, CLIENTFIRSTNAME, CLIENTLASTNAME, BIRTHDATE, ADDRESS, TELPROF, TELPRIV, FAX)

EMPLOYEE (EMPLOYEENUMBER, LASTNAMEEMP, FIRSTNAMEEMP, CATEGORY, SALARY)

BRAND (BRANDNUMBER, BRAND, COUNTRY)

MODEL (MODELNUMBER, BRANDNUMBER*, MODEL)

VEHICLE (VEHICLENUMBER, CUSTOMERNUMBER*, MODELNUMBER*, REGISTRATIONNUMBER, YEAR)

INTERVENTIONS (INTERVENTIONNUMBER, VEHICLENUMBER*, INTERVENTIONTYPE, INTERVSTARTDATE, INTERVENDDATE, INTERVCOST)

PARTICIPANTS (INTERVENTIONNUMBER*, EMPLOYEENUMBER*, STARTDATE, ENDDATE)

In this schema :

- Attributes beginning with date are of type Date; those starting with NUM are integers, and all others are strings, except SALARY and COUTINTERV which are reals.
- The CATEGORY of an employee is a string taken from the domain {'Mechanic', 'Assistant'}.
- The CIV attribute is a character string taken from the domain {'Mr', 'Miss', 'Mrs'}.

The instances of the different tables are shown in the following tables:

CUSTOMER TABLE

CUSTOMERNUMBER	CIV	FIRSTNAME	LASTNAME	BIRTHDATE	ADDRESS	TELPROF	TELPRIV	FAX
1	Mme	Cherifa	MAHBOUBA	08/08/1957	CITE 1013 LOGTS BT 61 Alger	561381813	562458714	
2	Mme	Lamia	TAHMI	31/12/1955	CITE BACHEDJARAH BATIMENT 38 -Bach Djerrah-Alger	0562467849	0561392487	
3	Mle	Ghania	DIAF AMROUNI	31/12/1955	43, RUE ABDERRAHMANE SBAA BELLE VUE-EL HARRACH-ALGER	0523894562	0619430945	0562784254
4	Mle	Chahinaz	MELEK	27/06/1955	HLM AISSAT IDIR CAGE 9 3EME ETAGE-EL HARRACH ALGER	0634613493	0562529463	
5	Mme	Noura	TECHTACHE	22/03/1949	16, ROUTE EL DJAMILA-AIN BENIAN-ALGER	0562757834		0562757843
6	Mme	Widad	TOUATI	14/08/1965	14 RUE DES FRERES AOUDIA-EL MOURADIA-ALGER	0561243967	0561401836	
7	Mle	Faiza	ABLOUL	28/10/1967	CITE DIPLOMATIQUE BT BLEU 14B N 3 DERGANA- ALGER	0562935427	0561486203	
8	Mme	Assia	HORRA	08/12/1963	32 RUE AHMED OUAKED-DELY BRAHIM-ALGER	0561038500		0562466733
9	Mle	Souad	MESBAH	30/08/1972	RESIDENCE CHABANI-HYDRA- ALGER	0561024358		
10	Mme	Houda	GROUDA	20/02/1950	EPSP THNIET ELABED BATNA	562939495	561218456	
11	Mle	Saida	FENNICHE		CITE DE L'INDEPENDANCE LARBAA BLIDA	0645983165	0562014784	
12	Mme	Samia	OUALI	17/11/1966	CITE 200 LOGEMENTS BT1 N1- JIJEL	0561374812	0561277013	
13	Mme	Fatiha	HADDAD	20/09/1980	RUE BOUFADA LAKHDARAT-AIN OULMANE-SETIF	0647092453	0562442700	
14	M.	Djamel	MATI		DRAA KEBILA HAMMAM GUERGOUR SETIF	0561033663	0561484259	
15	M.	Mohamed	GHRAIR	24/06/1950	CITE JEANNE D'ARC ECRAN B5-GAMBETTA-ORAN	0561390288		0562375849
16	M.	Ali	LAAOUAR		CITE 1ER MAI EX 137 LOGEMENTS-ADRAR	0639939410	0561255412	
17	M.	Messoud	AOUIZ	24/11/1958	RUE SAIDANI ABDESSLAM -AIN BESSEM-BOUIRA	0561439256	0561473625	
18	M.	Farid	AKIL	06/05/1961	3 RUE LARBI BEN M'HIDI-DRAA EL MIZAN-TIZI OUZOU	0562349254	0561294268	
19	Mme	Dalila	MOUHTADI		6, BD TRIPOLI ORAN	506271459	506294186	
20	M.	Younes	CHALAH		CITE DES 60 LOGTS BT D N 48-NACIRIA-BOUMERDES		0561358279	
21	M.	Boubeker	BARKAT	08/11/1935	CITE MENTOURI N 71 BT AB SMK Constantine	0561824538	0561326179	
22	M.	Seddik	HMIA		25 RUE BEN YAHIIYA-JIJEL	562379513		562493627
23	M.	Lamine	MERABAT	09/13/1965	CITE JEANNE D'ARC ECRAN B2-GAMBETTA-ORAN	0561724538	0561724538	

EMPLOYEE TABLE

EMPLOYEENUMBER	LASTNAMEEMP	FIRSTNAMEEMP	CATEGORY	SALARY
53	LACHEMI	Bouzid	Mécanicien	25000
54	BOUCHEMLA	Elias	Assistant	10000
55	HADJ	Zouhir	Assistant	12000
56	OUSSEDIK	Hakim	Mécanicien	20000
57	ABAD	Abdelhamid	Assistant	13000
58	BABACI	Tayeb	Mécanicien	21300
59	BELHAMIDI	Mourad	Mécanicien	19500
60	IGOUDJIL	Redouane	Assistant	15000
61	KOULA	Bahim	Mécanicien	23100
62	RAHALI	Ahcene	Mécanicien	24000
63	CHAOUI	Ismail	Assistant	13000
64	BADI	Hatem	Assistant	14000
65	MOHAMMEDI	Mustapha	Mécanicien	24000
66	FEKAR	Abdelaziz	Assistant	13500
67	SAIDOUNI	Wahid	Mécanicien	25000
68	BOULARAS	Farid	Assistant	14000
69	CHAKER	Nassim	Mécanicien	26000
71	TERKI	Yacine	Mécanicien	23000
72	TEBIBEL	Ahmed	Assistant	17000
80	LARDJOUNE	Karim		25000

MODEL TABLE

MODELNUMBER	BRANDNUMBER	MODEL
2	1	Diablo
3	2	Série 5
4	10	NSX
5	14	Classe C
6	17	Safrane
7	20	400 GT
8	12	Esprit
9	15	605
10	19	Prévia
11	7	550 Maranello
12	3	Bentley-Continental
13	10	Spider
14	13	Evoluzione
15	16	Carrera
16	16	Boxter
17	21	S 80
18	6	300 M
19	4	M 3
20	9	XJ 8
21	15	406 Coupé
22	20	300 Atlantic
23	14	Classe E
24	11	GS 300

25	5	Séville
26	18	95 Cabriolet
27	2	TT Coupé
28	7	F 355
29	45	POLO

BRAND TABLE

BRANDNUMBER	BRAND	COUNTRY
1	LAMBORGHINI	ITALIE
2	AUDI	ALLEMAGNE
3	ROLLS-ROYCE	GRANDE-BRETAGNE
4	BMW	ALLEMAGNE
5	CADILLAC	ETATS-UNIS
6	CHRYSLER	ETATS-UNIS
7	FERRARI	ITALIE
8	HONDA	JAPON
9	JAGUAR	GRANDE-BRETAGNE
10	ALFA-ROMEO	ITALIE
11	LEXUS	JAPON
12	LOTUS	GRANDE-BRETAGNE
13	MASERATI	ITALIE
14	MERCEDES	ALLEMAGNE
15	PEUGEOT	FRANCE
16	PORSCHE	ALLEMAGNE
17	RENAULT	FRANCE
18	SAAB	SUEDE
19	TOYOTA	JAPON
20	VENTURI	FRANCE
21	VOLVO	SUEDE

PARTICIPANTS TABLE

INTERVENTIONNUMBER	EMPLOYEEENUMBER	STARTDATE	ENDDATE
1	54	2006-02-26 09:00:00	2006-02-26 12:00:00
1	59	2006-02-25 09:00:00	2006-02-25 18:00:00
2	57	2006-02-24 14:00:00	2006-02-24 18:00:00
2	59	2006-02-23 09:00:00	2006-02-24 12:00:00
3	60	2006-04-09 09:00:00	2006-04-09 12:00:00
3	65	2006-04-06 14:00:00	2006-04-08 18:00:00
4	62	2006-05-14 09:00:00	2006-05-14 12:00:00
4	66	2006-02-14 14:00:00	2006-05-14 18:00:00
5	56	2006-02-22 09:00:00	2006-02-25 12:00:00
5	60	2006-02-23 09:00:00	2006-02-25 18:00:00
6	53	2006-03-03 14:00:00	2006-03-04 12:00:00
6	57	2006-03-04 14:00:00	2006-03-04 18:00:00
7	55	2006-04-09 14:00:00	2006-04-09 18:00:00
7	65	2006-04-09 09:00:00	2006-04-09 12:00:00
8	54	2006-05-12 09:00:00	2006-05-12 18:00:00
8	62	2006-05-11 14:00:00	2006-05-12 12:00:00

9	59	2006-02-22 09:00:00	2006-02-22 12:00:00
9	60	2006-02-22 14:00:00	2006-02-22 18:00:00
10	63	2006-04-09 14:00:00	2006-04-09 18:00:00
10	67	2006-04-08 09:00:00	2006-04-09 12:00:00
11	59	2006-03-09 09:00:00	2006-03-11 18:00:00
11	64	2006-03-09 09:00:00	2006-03-17 12:00:00
11	53	2006-03-08 14:00:00	2006-03-16 18:00:00
12	55	2006-05-05 09:00:00	2006-05-05 18:00:00
12	56	2006-05-03 09:00:00	2006-05-05 12:00:00
13	64	2006-05-12 14:00:00	2006-05-12 18:00:00
14	88	2006-05-07 14:00:00	2006-05-10 18:00:00

VEHICLE TABLE

VEHICLENUMBER	CUSTOMERNUMBER	MODELNUMBER	REGISTRATIONNUMBER	YEAR
1	2	6	12519216	1992
2	9	20	124219316	1993
3	17	8	1452318716	1987
4	6	12	3145219816	1998
5	16	23	1278919816	1998
6	20	6	3853319735	1997
7	7	8	1453119816	1998
8	16	14	8365318601	1986
9	13	15	3087319233	1992
10	20	22	9413119935	1999
11	9	16	1572319801	1998
12	14	20	6025319733	1997
13	19	17	5205319736	1997
14	22	21	7543119207	1992
15	4	19	6254319916	1999
16	16	21	9831419701	1997
17	12	11	4563117607	1976
18	1	2	7973318216	1982
19	18	77	3904318515	1985
20	22	2	1234319707	1997
21	3	19	8429318516	1985
22	8	19	1245619816	1998
23	7	25	1678918516	1985
24	80	9	1789519816	1998
25	13	5	1278919833	1998
26	3	10	1458919316	1993
27	10	7	1256019804	1998
28	10	3	1986219904	1999

INTERVENTION TABLE

INTERVENTIONNUMBER	VEHICLENUMBER	INTERVENTIONTYPE	INTERVSTARTDATE	INTERVENDDATE	INTERVCOST
1	3	Réparation	2006-02-25 09:00:00	2006-02-26 12:00:00	30000
2	21	Réparation	2006-02-23 09:00:00	2006-02-24 18:00:00	10000
3	25	Réparation	2006-04-06 14:00:00	2006-04-09 12:00:00	42000
4	10	Entretien	2006-05-14 09:00:00	2006-05-14 18:00:00	10000
5	6	Réparation	2006-02-22 09:00:00	2006-02-25 18:00:00	40000
6	14	Entretien	2006-03-03 14:00:00	2006-03-04 18:00:00	7500
7	1	Entretien	2006-04-09 09:00:00	2006-04-09 18:00:00	8000
8	17	Entretien	2006-05-11 14:00:00	2006-05-12 18:00:00	9000
9	22	Entretien	2006-02-22 09:00:00	2006-02-22 18:00:00	7960
10	2	Entretien et Réparation	2006-04-08 09:00:00	2006-04-09 18:00:00	45000
11	28	Réparation	2006-03-08 14:00:00	2006-03-17 12:00:00	36000
12	20	Entretien et Réparation	2006-05-03 09:00:00	2006-05-05 18:00:00	27000
13	8	Réparation Système	2006-05-12 14:00:00	2006-05-12 18:00:00	17846
14	1	Réparation	2006-05-10 14:00:00	2006-05-12 12:00:00	39000
15	20	Réparation Système	2006-06-25 09:00:00	2006-06-25 12:00:00	27000
16	77	Réparation	2006-06-27 09:00:00	2006-06-30 12:00:00	25000

Creation and manipulation of a DB

This Lab focuses on the creation, manipulation and querying of a DB as well as static integrity constraints, schema evolution, etc.

It is advisable to create a user as well as the necessary objects in order to obtain more flexibility in the administration.

Creating a user requires at least two tablespaces, one default and one temporary. These operations must be performed as a DBA (Data Base Administrator).

Some Syntaxes:

- **Tablespace creation**

```
CREATE TABLESPACE xxx_tbs DATAFILE 'C:\tbs_xxx.dat' SIZE 100M AUTOEXTEND ON ONLINE;
```

Description :

CREATE TABLESPACE xxx_tbs	Specifies the name of the database tablespace.
DATAFILE 'C:\tbs_xxx.dat' SIZE 100M	Specifies the full name of the system file and its size in megabytes.
AUTOEXTEND ON	The size is increased automatically in case of saturation
ONLINE	Available immediately upon creation

- **Temporary Tablespace creation**

```
CREATE TEMPORARY TABLESPACE xxx_TempTBS TEMPFILE 'C:\temp_xxx.dat' SIZE 100M AUTOEXTEND ON;
```

- **User creation**

```
Create User Nom_User Identified by Password Default Tablespace Tablespace_Name  
Temporary Tablespace Temp_Tablespace_Name;
```

- **Grant all rights to the user:**

```
GRANT ALL privileges to User_Name
```

- **Table creation**

```
CREATE TABLE [schema.] Table_name  
(column1 type1 [DEFAULT value1] [NOT NULL] [, column2 type2 [DEFAULT value2] [NOT NULL] ]  
[CONSTRAINT constraintName1 constraintType1]);
```

Four types of constraints

- UNIQUE (column1[,column2])
- PRIMARY KEY (column1[,column2])
- FOREIGN KEY (column1 [,column2]) REFERENCES [schma.]parentTableName (column1 [,column2]) [ON DELETE { CASCADE | SET NULL }]
- CHECK (condition)

To modify data without taking into account a constraint, this constraint must be deactivated:

```
ALTER TABLE tableName DISABLE CONSTRAINT constraintName;
```

To Activate a Constraint

```
ALTER TABLE tableName ENABLE CONSTRAINT constraintName [EXCEPTIONS INTO tableErrors];
```

Create the "tableErrors" table to identify the tuples that do not satisfy the constraint.

```
CREATE TABLE TableErrors (address ROWID, user VARCHAR2(30), tableName VARCHAR2(30), constraintName VARCHAR2(30));
```

Required work

Tables and Constraints Creation

Part I: Creating TableSpaces and Users

1. Create two TableSpaces *INTERVENTION_TBS* and *INTERVENTION_TempTBS*
2. Create a **DBAINTERVENTION** user by assigning him the two tablespaces created previously
3. Grant all privileges to this user.

Part II: Data Definition Language

4. Create the basic relationships.
5. Add all constraints
6. List the problems you encountered
7. How did you correct them

Updating the Structure

8. Add the DATEINSTALLATION attribute of Date type to the EMPLOYEE relationship.
9. Add the not null constraint for the CATEGORY, SALARY attributes of the EMPLOYEE relationship.
10. Modify the length of the PRENOMEMP attribute (enlarge, reduce).
11. Delete the DATEINSTALLATION column in the EMPLOYEE table. Verify deletion.
12. Rename the ADDRESS column in the CUSTOMER table to CUSTOMERADDRESS. Check.
13. Add the following constraint: Intervention start date must be less than the intervention end date.

Data manipulation language

14. Fill all the tables by the instances represented above
15. List the problems you encountered
16. How did you correct them
17. Suppose the salary of BADI employee Hatem is increased by 5000DA. What should be done?
18. For interventions in the month of February, add 5 five days to the start date. Disable constraint to allow editing. Reactivate the constraint.
19. Delete all 5 Series model vehicles. What are the problems encountered?
20. How did you correct them