

HMIN122M Rendu

TP1

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1 Modèle conceptuel : UML des cahiers des charges

1.1 Cahier des charges #1 : les photos

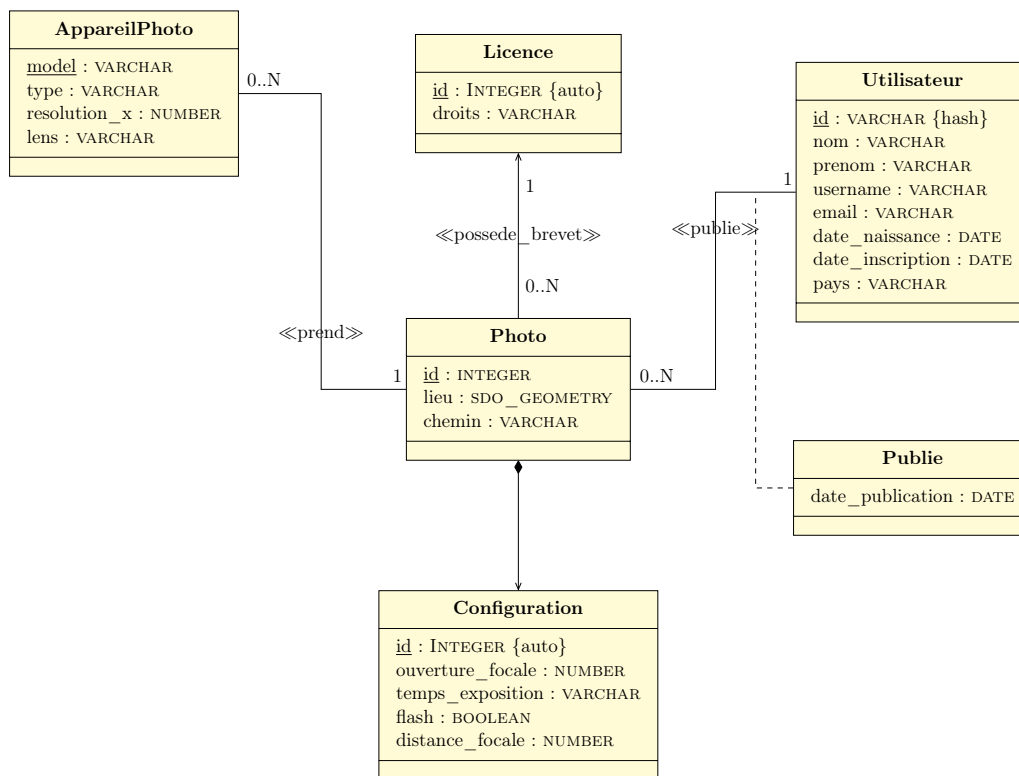


FIGURE 1 – Cahier des charges #1 : les photos

1.2 Cahier des charges #2 : publications, albums, et galleries

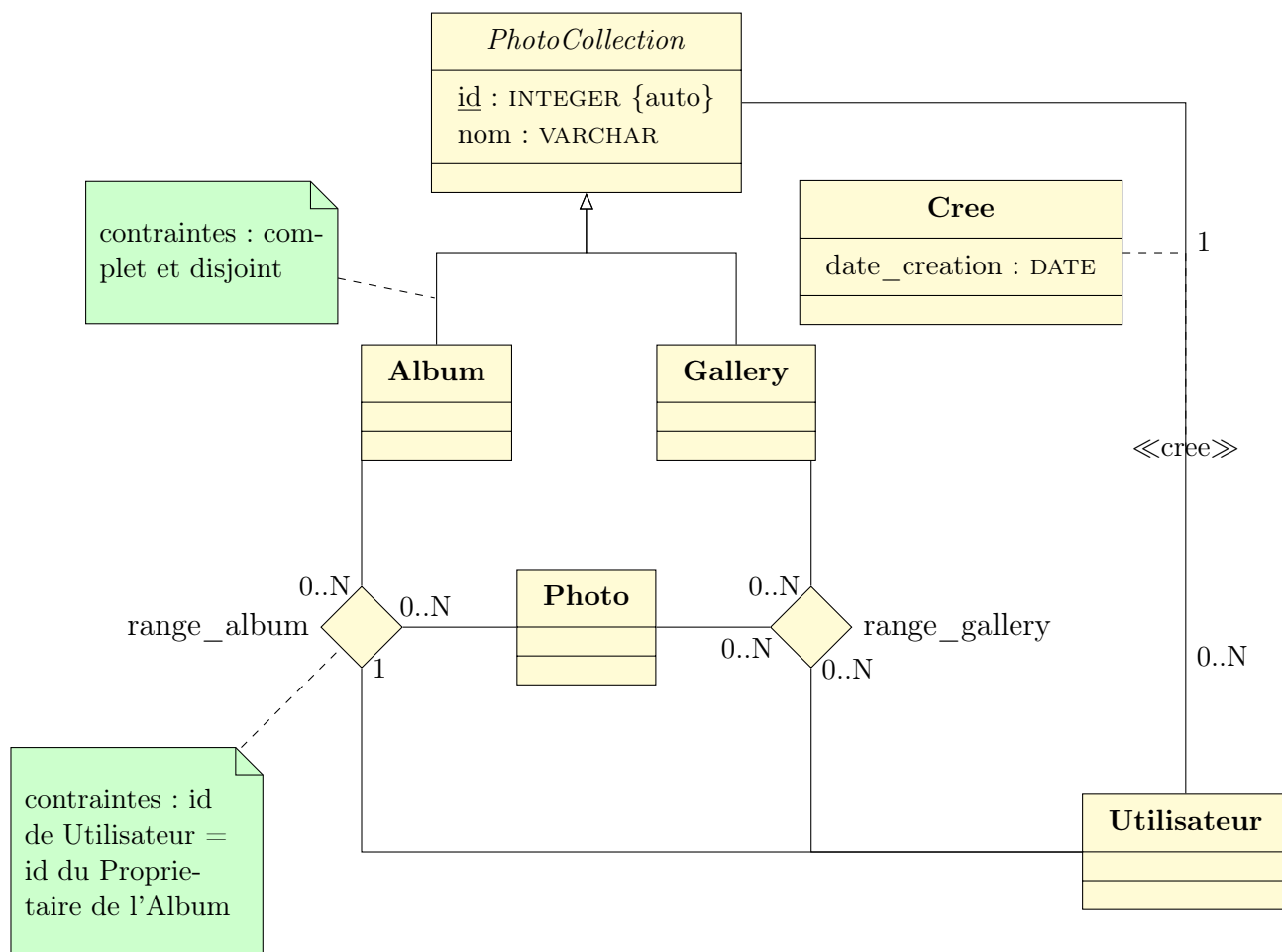


FIGURE 2 – Cahier des charges #2 : publications, albums, et galeries

1.3 Cahier des charges #3 : les interactions entre utilisateurs

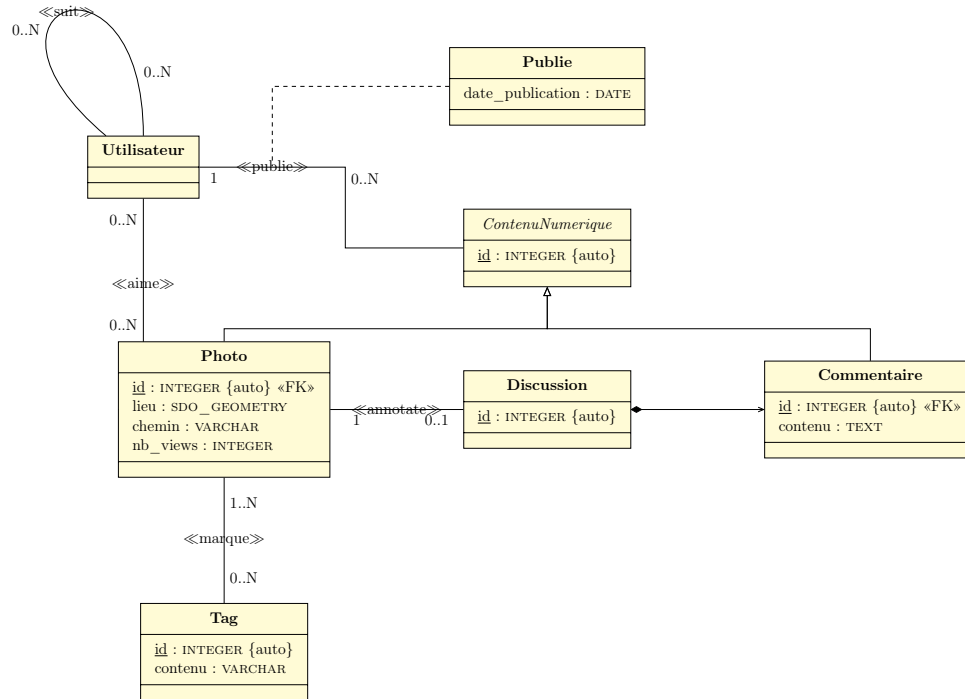


FIGURE 3 – Cahier des charges #3 : les interactions entre utilisateurs

2 Modèle relationnel

- **AppareilPhoto**(model, type, resolution_x, lens)
- **Licence**(id, droits)
- **Configuration**(id, ouverture_focale, temps_exposition, flash, distance_focale)
- **Utilisateur**(id, nom, prenom, username, email, date_naissance, date_inscription, pays)
- **ContenuNumerique**(id, id_utilisateur, date_publication)
- **PhotoCollection**(id, nom, id_utilisateur, date_creation)
- **Album**(id)
- **Gallery**(id)
- **Photo**(id, lieu, chemin, nb_views, id_appareil, id_licence, id_configuration)
- **Discussion**(id, id_photo)
- **Commentaire**(id, contenu, id_discussion)
- **Tag**(id, contenu)
- **range_gallery**(id_gallery, id_utilisateur, id_photo)

- `range_album(id_album, id_utilisateur, id_photo)`¹
- `aime(id_utilisateur, id_photo)`
- `suit(id_utilisateur1, id_utilisateur2)`²
- `marque(id_tag, id_photo)`

Appendices

SQL

.1 Requêtes de création des tables de la base de données

```

1  /*
2  * @brief Creates the tables of the database without
      filling them
3  * @author Bachar RIMA
4  * @author Joseph SABA
5  */
6
7  CREATE TABLE AppareilPhoto (
8      model VARCHAR2(50),
9      type VARCHAR2(50) NOT NULL,
10     resolution_x NUMBER,
11     lens VARCHAR2(50),
12     CONSTRAINT PK_APPAREIL_PHOTO
13         PRIMARY KEY(model)
14 );
15
16 CREATE TABLE Licence (
17     licence_id NUMBER,
18     droits VARCHAR2(40) UNIQUE NOT NULL CHECK (
19         droits in ('tous droits réservés', 'utilisation
                commerciale autorisée', 'modifications de
                l''image autorisées')),
20     CONSTRAINT PK_LICENCE
21         PRIMARY KEY(licence_id)
22 );
23

```

1. un *trigger* est requis pour vérifier la contrainte d'intégrité désignant l'unicité du propriétaire des photos dans un album

2. Contrainte d'intégrité : $id_utilisateur_1 \neq id_utilisateur_2$

```

24 CREATE TABLE Configuration (
25     conf_id NUMBER,
26     ouverture_focale NUMBER,
27     temps_exposition VARCHAR2(10),
28     flash NUMBER(1) NOT NULL,
29     distance_focale NUMBER,
30     CONSTRAINT PK_CONFIGURATION
31         PRIMARY KEY(conf_id)
32 );
33
34 CREATE TABLE Utilisateur (
35     utilisateur_id VARCHAR2(50),
36     nom VARCHAR2(50) NOT NULL,
37     prenom VARCHAR2(50) NOT NULL,
38     username VARCHAR2(50) NOT NULL UNIQUE,
39     email VARCHAR2(50) NOT NULL UNIQUE,
40     date_naissance DATE,
41     date_inscription DATE DEFAULT SYSDATE NOT NULL,
42     pays VARCHAR2(50),
43     CONSTRAINT PK_UTILISATEUR
44         PRIMARY KEY(utilisateur_id)
45 );
46
47 CREATE TABLE ContenuNumerique (
48     contenu_id NUMBER,
49     utilisateur_id VARCHAR2(50) NOT NULL,
50     date_publication DATE DEFAULT SYSDATE NOT NULL,
51     CONSTRAINT PK_CONTENU_NUMERIQUE
52         PRIMARY KEY(contenu_id),
53     CONSTRAINT FK_CONTENU_NUMERIQUE_UTILISATEUR
54         FOREIGN KEY(utilisateur_id) REFERENCES
55             Utilisateur(utilisateur_id) ON DELETE CASCADE
56 );
57
58 CREATE TABLE PhotoCollection (
59     photo_collection_id NUMBER,
60     nom VARCHAR2(50) NOT NULL,
61     utilisateur_id VARCHAR2(50) NOT NULL,
62     date_creation DATE DEFAULT SYSDATE NOT NULL,
63     CONSTRAINT PK_PHOTO_COLLECTION
64         PRIMARY KEY(photo_collection_id),
65     CONSTRAINT FK_PHOTO_COLLECTION

```

```

65     FOREIGN KEY(utilisateur_id) REFERENCES
        Utilisateur(utilisateur_id) ON DELETE CASCADE
66 );
67
68 CREATE TABLE Album (
69     album_id NUMBER,
70     CONSTRAINT PK_ALBUM
71     PRIMARY KEY(album_id),
72     CONSTRAINT FK_ALBUM_PHOTO_COLLECTION
73     FOREIGN KEY(album_id) REFERENCES
        PhotoCollection(photo_collection_id) ON DELETE
        CASCADE
74 );
75
76 CREATE TABLE Gallery (
77     gallery_id NUMBER,
78     CONSTRAINT PK_GALLERY
79     PRIMARY KEY(gallery_id),
80     CONSTRAINT FK_GALLERY_PHOTO_COLLECTION
81     FOREIGN KEY(gallery_id) REFERENCES
        PhotoCollection(photo_collection_id) ON DELETE
        CASCADE
82 );
83
84 CREATE TABLE Photo (
85     photo_id NUMBER,
86     lieu VARCHAR2(50) NOT NULL,
87     chemin VARCHAR2(200) NOT NULL,
88     nb_views NUMBER DEFAULT 0,
89     model_appareil VARCHAR2(50),
90     licence_id NUMBER,
91     conf_id NUMBER,
92     CONSTRAINT PK_PHOTO
93     PRIMARY KEY(photo_id),
94     CONSTRAINT FK_PHOTO_CONTENU_NUMERIQUE
95     FOREIGN KEY(photo_id) REFERENCES
        ContenuNumerique(contenu_id) ON DELETE CASCADE,
96     CONSTRAINT FK_PHOTO_APPAREIL_PHOTO
97     FOREIGN KEY(model_appareil) REFERENCES
        AppareilPhoto(model) ON DELETE SET NULL,
98     CONSTRAINT FK_PHOTO_LICENCE
99     FOREIGN KEY(licence_id) REFERENCES
        Licence(licence_id) ON DELETE SET NULL,

```

```

100     CONSTRAINT FK_PHOTO_CONFIGURATION
101     FOREIGN KEY(conf_id) REFERENCES
102         Configuration(conf_id) ON DELETE SET NULL
103 );
104 CREATE TABLE Discussion (
105     discussion_id NUMBER,
106     photo_id NUMBER NOT NULL,
107     CONSTRAINT PK_DISCUSSION
108     PRIMARY KEY(discussion_id),
109     CONSTRAINT FK_DISCUSSION_PHOTO
110     FOREIGN KEY(photo_id) REFERENCES Photo(photo_id) ON
111         DELETE CASCADE
112 );
113 CREATE TABLE Commentaire (
114     comment_id NUMBER,
115     contenu VARCHAR2(500),
116     discussion_id NUMBER NOT NULL,
117     CONSTRAINT PK_COMMENTAIRE
118     PRIMARY KEY(comment_id),
119     CONSTRAINT FK_COMMENTAIRE_DISCUSSION
120     FOREIGN KEY(discussion_id) REFERENCES
121         Discussion(discussion_id) ON DELETE CASCADE
122 );
123 CREATE TABLE Aime (
124     utilisateur_id varchar(50),
125     photo_id NUMBER,
126     CONSTRAINT PK_AIME
127     PRIMARY KEY (utilisateur_id, photo_id),
128     CONSTRAINT FK_AIME_UTILISATEUR
129     FOREIGN KEY(utilisateur_id) REFERENCES
130         Utilisateur(utilisateur_id) ON DELETE CASCADE,
131     CONSTRAINT FK_AIME_PHOTO
132     FOREIGN KEY(photo_id) REFERENCES Photo(photo_id) ON
133         DELETE CASCADE
134 );
135 CREATE TABLE Tag (
136     tag_id NUMBER,
137     contenu VARCHAR2(50) NOT NULL,
138     CONSTRAINT PK_TAG

```



```

138     PRIMARY KEY(tag_id)
139 );
140
141 CREATE TABLE Range_gallery (
142     gallery_id NUMBER,
143     utilisateur_id VARCHAR2(50),
144     photo_id NUMBER,
145     CONSTRAINT PK_RANGE_GALLERY
146     PRIMARY KEY(gallery_id, utilisateur_id, photo_id),
147     CONSTRAINT FK_RANGE_GALLERY_GALLERY
148     FOREIGN KEY(gallery_id) REFERENCES
149         Gallery(gallery_id) ON DELETE CASCADE,
150     CONSTRAINT FK_RANGE_GALLERY_UTILISATEUR
151     FOREIGN KEY(utilisateur_id) REFERENCES
152         Utilisateur(utilisateur_id) ON DELETE CASCADE,
153     CONSTRAINT FK_RANGE_GALLERY_PHOTO
154     FOREIGN KEY(photo_id) REFERENCES Photo(photo_id) ON
155         DELETE CASCADE
156 );
157
158 CREATE TABLE Range_album (
159     album_id NUMBER,
160     utilisateur_id VARCHAR2(50),
161     photo_id NUMBER,
162     CONSTRAINT PK_RANGE_ALBUM
163     PRIMARY KEY(album_id, utilisateur_id, photo_id),
164     CONSTRAINT FK_RANGE_ALBUM_ALBUM
165     FOREIGN KEY(album_id) REFERENCES Album(album_id) ON
166         DELETE CASCADE,
167     CONSTRAINT FK_RANGE_ALBUM_UTILISATEUR
168     FOREIGN KEY(utilisateur_id) REFERENCES
169         Utilisateur(utilisateur_id) ON DELETE CASCADE,
170     CONSTRAINT FK_RANGE_ALBUM_PHOTO
171     FOREIGN KEY(photo_id) REFERENCES Photo(photo_id) ON
172         DELETE CASCADE
173 );
174
175 CREATE TABLE Suit (
176     utilisateur_id1 VARCHAR2(50),
177     utilisateur_id2 VARCHAR2(50),
178     CONSTRAINT PK_SUIT
179     PRIMARY KEY(utilisateur_id1, utilisateur_id2),
180     CONSTRAINT FK_SUIT_UTILISATEUR1

```

```

175     FOREIGN KEY(utilisateur_id1) REFERENCES
        Utilisateur(utilisateur_id) ON DELETE CASCADE,
176 CONSTRAINT FK_SUIT_UTILISATEUR2
177     FOREIGN KEY(utilisateur_id2) REFERENCES
        Utilisateur(utilisateur_id) ON DELETE CASCADE
178 );
179
180 CREATE TABLE Marque (
181     tag_id NUMBER,
182     photo_id NUMBER,
183     CONSTRAINT PK_MARQUE
184     PRIMARY KEY(tag_id, photo_id),
185     CONSTRAINT FK_MARQUE_TAG
186     FOREIGN KEY(tag_id) REFERENCES Tag(tag_id) ON DELETE
        CASCADE,
187     CONSTRAINT FK_MARQUE_PHOTO
188     FOREIGN KEY(photo_id) REFERENCES Photo(photo_id) ON
        DELETE CASCADE
189 );
190 /

```

```

1  /*
2  * @brief Creates the triggers for some tables of the
        database
3  * @author Bachar RIMA
4  * @author Joseph SABA
5  */
6
7  /*
8  Album is not a gallery
9  */
10 CREATE OR REPLACE TRIGGER album_inheritance_trigger
11 BEFORE INSERT OR UPDATE ON Album
12 FOR EACH ROW
13 BEGIN
14     for gallery in (SELECT gallery_id
15                     FROM Gallery) loop
16         if :new.album_id = gallery.gallery_id THEN
17             RAISE_APPLICATION_ERROR(-20505, 'album_id is
                already used as a gallery_id');
18         END IF;
19     END loop;
20 END;

```

```

21 /
22
23 /*
24 Gallery is not an album
25 */
26 CREATE OR REPLACE TRIGGER gallery_inheritance_trigger
27 BEFORE INSERT OR UPDATE ON Gallery
28 FOR EACH ROW
29 BEGIN
30     for album in (SELECT album_id
31         FROM Album) loop
32         if :new.gallery_id = album.album_id THEN
33             RAISE_APPLICATION_ERROR(-20506, 'gallery_id is
34                 already used as an album_id');
35         END IF;
36     END loop;
37 END;
38 /
39
40 /*
41 photo is not a comment
42 */
43 CREATE OR REPLACE TRIGGER photo_inheritance_trigger
44 BEFORE INSERT OR UPDATE ON Photo
45 FOR EACH ROW
46 BEGIN
47     for comment in (SELECT comment_id
48         FROM Commentaire) loop
49         if :new.photo_id = comment.comment_id THEN
50             RAISE_APPLICATION_ERROR(-20507, 'photo_id is
51                 already used as a comment_id');
52         END IF;
53     END loop;
54 END;
55 /
56
57 /*
58 comment is not a photo
59 */
60 CREATE OR REPLACE TRIGGER commentaire_inheritance_trigger
61 BEFORE INSERT OR UPDATE ON Commentaire
62 FOR EACH ROW
63 BEGIN

```

```

62   for photo in (SELECT photo_id
63   FROM Photo) loop
64       if :new.comment_id = photo.photo_id THEN
65           RAISE_APPLICATION_ERROR(-20508, 'comment_id is
              already used as a photo_id');
66       END IF;
67   END loop;
68 END;
69 /
70
71 /*
72 Users can't follow their own account
73 */
74 CREATE OR REPLACE TRIGGER suit_trigger
75 BEFORE INSERT OR UPDATE ON Suit
76 FOR EACH ROW
77 BEGIN
78     IF :new.utilisateur_id1 = :new.utilisateur_id2 THEN
79         RAISE_APPLICATION_ERROR(-20509, 'users must have
              different ids: a user cannot follow the
              publications of himself');
80     END IF;
81 END;
82 /
83
84 /*
85 Any photo of an album must belong to the album's owner
86 */
87 CREATE OR REPLACE TRIGGER range_album_trigger
88 BEFORE INSERT OR UPDATE ON Range_album
89 FOR EACH ROW
90 DECLARE
91     owner_id varchar(50);
92 BEGIN
93     SELECT utilisateur_id INTO owner_id
94     FROM ContenuNumerique
95     WHERE contenu_id = :new.photo_id;
96     IF :new.utilisateur_id <> owner_id THEN
97         RAISE_APPLICATION_ERROR(-20510, 'the owner of the
              album is not the owner of the photo having
              photo_id');
98     END IF;
99 END;

```

.2 Requêtes de population des tables de la base de données

```

1  INSERT INTO AppareilPhoto VALUES ('D850', 'Nikon',
    '28', '18.0-105.0 mm');
2  INSERT INTO AppareilPhoto VALUES ('EOS 5D Mark IV',
    'Canon', '32', '61-point AF, 41');
3  INSERT INTO AppareilPhoto VALUES ('D500', 'Nikon',
    31, '153-point AF, 99');
4  INSERT INTO AppareilPhoto VALUES ('T 260', 'Aigo',
    23, '15.0-96.0 mm');
5  INSERT INTO AppareilPhoto VALUES ('X320', 'Sony',
    30, '19.0-115.0 mm');
6
7  INSERT INTO Configuration VALUES (1, 5.3, '1/40', 1, 62);
8  INSERT INTO Configuration VALUES (2, 6.1, '1/10', 0, 58);
9  INSERT INTO Configuration VALUES (3, 6.3, '1/25', 0, 64);
10 INSERT INTO Configuration VALUES (4, 5.7, '1/5', 1, 61);
11 INSERT INTO Configuration VALUES (5, 5.9, '1/30', 1, 55);
12
13 INSERT INTO Licence VALUES (1, 'tous droits réservés');
14 INSERT INTO Licence VALUES (2, 'utilisation commerciale
    autorisée');
15 INSERT INTO Licence VALUES (3, 'modifications de l''image
    autorisées');
16
17 INSERT INTO Utilisateur VALUES (1, 'Saba', 'Joseph',
    'joseph.saba', 'joseph.saba@gmail.com', '01-OCT-1993', '05-NOV-18',
    'LIBAN');
18 INSERT INTO Utilisateur VALUES (2, 'RIMA', 'BACHAR',
    'bachar.rima', 'bachar.rima@gmail.com', '13-JUN-1992', '12-JAN-12',
    'LIBAN');
19 INSERT INTO Utilisateur VALUES (3, 'MUSTAPHA', 'DIMA',
    'dima.m', 'dima.m@gmail.com', '23-AUG-1995', '09-MAR-16',
    'FRANCE');
20 INSERT INTO Utilisateur VALUES (4, 'PANGARY',
    'Pratyusha',
    'ppangari', 'ppamgari@gmail.com', '23-JUL-1994', '15-JAN-17',
    'INDE');

```

```

21 INSERT INTO Utilisateur VALUES (5, 'KHOURY', 'Jill',
    'jillkhoury', 'jillkhoury@gmail.com', '26-JUL-1988', '19-MAY-15',
    'AUSTRALIE');
22
23 INSERT INTO ContenuNumerique VALUES (1, 1, '10-NOV-18');
24 INSERT INTO ContenuNumerique VALUES (2, 1, '11-NOV-18');
25 INSERT INTO ContenuNumerique VALUES (3, 1, '16-NOV-18');
26 INSERT INTO ContenuNumerique VALUES (4, 2, '10-OCT-17');
27 INSERT INTO ContenuNumerique VALUES (5, 3, '01-JUL-18');
28 INSERT INTO ContenuNumerique VALUES (6, 2, '11-NOV-18');
29 INSERT INTO ContenuNumerique VALUES (7, 4, '11-OCT-17');
30 INSERT INTO ContenuNumerique VALUES (8, 5, '12-JAN-18');
31 INSERT INTO ContenuNumerique VALUES (9, 2, '01-FEB-18');
32 INSERT INTO ContenuNumerique VALUES (10, 3, '11-JUL-18');
33
34 INSERT INTO Photo VALUES (1, 'LIBAN',
    'https://c1.staticflickr.com/9/8768/27869512383_ce5deed625_b.jpg',
    538, 'EOS 5D Mark IV', 1, 1);
35 INSERT INTO Photo VALUES (2, 'FRANCE',
    'https://c2.staticflickr.com/4/3668/10089150975_13c3dbb0ca_b.jpg',
    3893, 'T 260', 2, 2);
36 INSERT INTO Photo VALUES (3, 'FRANCE',
    'https://c2.staticflickr.com/8/7487/15532262769_3fd027f319_b.jpg',
    13744, 'D500', 1, 2);
37 INSERT INTO Photo VALUES (4, 'BRASIL',
    'https://c2.staticflickr.com/4/3844/32846030723_9ff438c689_b.jpg',
    124, 'EOS 5D Mark IV', 3, 4);
38 INSERT INTO Photo VALUES (5, 'Brasil',
    'https://c2.staticflickr.com/6/5523/9098371098_fbaf434821_b.jpg',
    2857, 'D850', 1, 5);
39
40 INSERT INTO Aime VALUES (1,1);
41 INSERT INTO Aime VALUES (2,3);
42 INSERT INTO Aime VALUES (1,2);
43 INSERT INTO Aime VALUES (4,3);
44
45 INSERT INTO Tag VALUES (1, 'flag');
46 INSERT INTO Tag VALUES (2, 'nature');
47 INSERT INTO Tag VALUES (3, 'country');
48 INSERT INTO Tag VALUES (4, 'views');
49 INSERT INTO Tag VALUES (5, 'rock');
50
51 INSERT INTO Discussion VALUES (1,1);

```

```

52 INSERT INTO Discussion VALUES (2,2);
53 INSERT INTO Discussion VALUES (3,3);
54 INSERT INTO Discussion VALUES (4,4);
55 INSERT INTO Discussion VALUES (5,5);
56
57 INSERT INTO Commentaire VALUES (6, 'nice photo', 1);
58 INSERT INTO Commentaire VALUES (7, 'where did you take
    this?', 2);
59 INSERT INTO Commentaire VALUES (8, 'amazing!', 3);
60 INSERT INTO Commentaire VALUES (9, 'follow my page', 4);
61 INSERT INTO Commentaire VALUES (10, 'nice photo', 5);
62
63 INSERT INTO PhotoCollection VALUES (1, 'ma collection',
    1, '13-JAN-2018');
64 INSERT INTO PhotoCollection VALUES (2, 'été', 1,
    '19-OCT-2018');
65 INSERT INTO PhotoCollection VALUES (3, 'paysages', 2,
    '23-JUL-2018');
66 INSERT INTO PhotoCollection VALUES (4, 'pays', 3,
    '03-FEB-2018');
67 INSERT INTO PhotoCollection VALUES (5, 'album 2', 4,
    '03-JUN-2018');
68 INSERT INTO PhotoCollection VALUES (6, 'hiver', 5,
    '13-MAR-2017');
69 INSERT INTO PhotoCollection VALUES (7, 'maisons', 1,
    '18-MAY-2016');
70 INSERT INTO PhotoCollection VALUES (8, 'famille', 2,
    '13-JAN-2018');
71 INSERT INTO PhotoCollection VALUES (9, 'universite', 5,
    '11-AUG-2018');
72 INSERT INTO PhotoCollection VALUES (10, 'arbres', 4,
    '09-DEC-2017');
73
74 INSERT INTO Album VALUES (1);
75 INSERT INTO Album VALUES (2);
76 INSERT INTO Album VALUES (3);
77 INSERT INTO Album VALUES (4);
78 INSERT INTO Album VALUES (5);
79
80 INSERT INTO Gallery VALUES (6);
81 INSERT INTO Gallery VALUES (7);
82 INSERT INTO Gallery VALUES (8);
83 INSERT INTO Gallery VALUES (9);

```

```

84 INSERT INTO Gallery VALUES (10);
85
86 INSERT INTO Range_gallery VALUES (6,1,1);
87 INSERT INTO Range_gallery VALUES (6,1,2);
88 INSERT INTO Range_gallery VALUES (6,1,3);
89 INSERT INTO Range_gallery VALUES (7,2,4);
90 INSERT INTO Range_gallery VALUES (7,2,5);
91 INSERT INTO Range_gallery VALUES (8,3,1);
92 INSERT INTO Range_gallery VALUES (7,2,1);
93
94 INSERT INTO Range_album VALUES (1,1,1);
95 INSERT INTO Range_album VALUES (2,1,2);
96 INSERT INTO Range_album VALUES (3,1,3);
97 INSERT INTO Range_album VALUES (4,2,4);
98 INSERT INTO Range_album VALUES (5,3,5);
99
100 INSERT INTO Suit VALUES (1,2);
101 INSERT INTO Suit VALUES (1,3);
102 INSERT INTO Suit VALUES (2,3);
103 INSERT INTO Suit VALUES (3,4);
104 INSERT INTO Suit VALUES (3,5);
105
106 INSERT INTO Marque VALUES (1,2);
107 INSERT INTO Marque VALUES (2,1);
108 INSERT INTO Marque VALUES (3,5);
109 INSERT INTO Marque VALUES (1,3);
110 INSERT INTO Marque VALUES (2,3);

```

.3 Requêtes d'interrogation de la base de données

```

1  /*
2  * @brief Queries to test the tables of the database
3  * @author Bachar RIMA
4  * @author Joseph SABA
5  */
6
7  /*"les photos de France*/
8  SELECT *
9  FROM Photo
10 WHERE lieu LIKE '%FRANCE%';
11
12 /*les utilisateurs ayant pris des photos de France*/

```



```

13 SELECT *
14 FROM Utilisateur, Photo, ContenuNumerique
15 WHERE contenu_id = photo_id
16 AND Utilisateur.utilisateur_id =
    ContenuNumerique.utilisateur_id
17 AND lieu LIKE '%FRANCE%';
18
19 /*les appareils utilisés pour prendre des photos de
    France*/
20 SELECT *
21 FROM AppareilPhoto, Photo
22 WHERE model = model_appareil
23 AND lieu LIKE '%FRANCE%';
24
25 /*les photos les plus appréciées avec la licence de
    distribution 'tous droits réservés'*/
26 SELECT Aime.photo_id, chemin, lieu, count(*) AS likes
27 FROM Photo, Aime, Licence
28 WHERE droits = 'tous droits réservés'
29 AND Photo.licence_id = Licence.licence_id
30 AND Photo.photo_id = Aime.photo_id
31 GROUP BY Aime.photo_id, chemin, lieu
32 ORDER BY likes DESC;
33
34 /*les photos incluses dans le plus grand nombre de
    galleries*/
35 SELECT Range_gallery.photo_id, chemin, lieu, count(*) AS
    nb_galleries
36 FROM Photo, Range_gallery
37 WHERE Photo.photo_id = Range_gallery.photo_id
38 GROUP BY Range_gallery.photo_id, chemin, lieu
39 ORDER BY nb_galleries DESC;

```