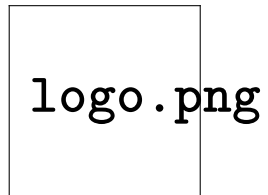# SQL3 ASSIGNMENT

logo.png

Tecnologias de Bases de Dados

4° **ano** 2° **semestre**
Mestrado Integrado em Engenharia Informática e Computação

Hugo Drumond   201102900   up201102900@fe.up.pt
Rui Gonçalves   201201775   up201201775@fe.up.pt

4 de Maio de 2017

Conteúdo

1 Design an object-relational data model for this situation, exploiting the SQL3 extensions

1.1 Diagrama de classes uml

Este diagrama descreve a estrutura high-level do problema. Foram acrescentadas restrições, informação de tipos e ids. Os ids podem ou não representar chaves primárias. Tal acontece na nossa transformação para o modelo relacional. No caso do modelo objeto-relacional usamos o id como identificador único para os items poderem ser encontrados facilmente numa página web, por exemplo: /clients/1, /images/1, /**/:id.
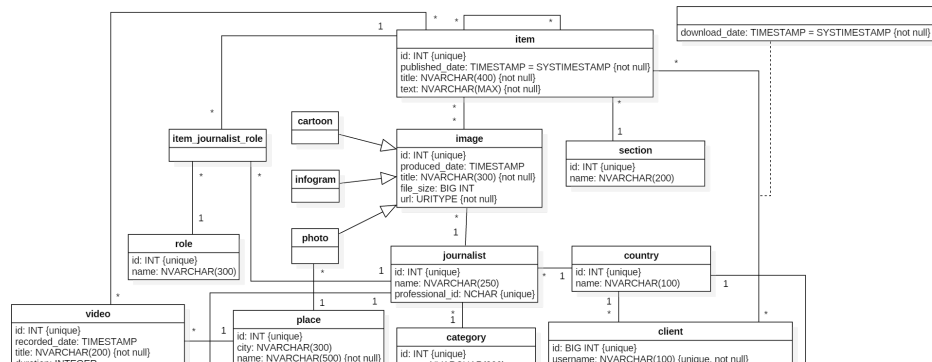

Figura 1: Uml Class Diagram

1.2 Modelo Relacional

```
item(id, section_id -> section(id), published_date,
   title, text)
item_image(item_id -> item(id), image_id -> image(id))
item_video(item_id -> item(id), video_id -> video(id))
item_client(item_id -> item(id), client_id ->
   client(id), download_date)
related_item(item_id -> item(id), related_item_id ->
   item(id))
section(id, name)

image(id, journalist_id -> journalist(id),
   produced_date, title, file_size, url, place_id ->
   place(id), image_type_id -> image_type(id))
image_type(id, name)
```

```
video(id, journalist_id -> journalist(id), place_id
    -> place(id), recorded_date, title, duration, url)

role(id, name)
category(id, name)
journalist(id, category_id -> category(id),
    country_id -> country(id), professional_id, name)
item_journalist_role(item_id -> item(id),
    journalist_id -> journalist(id), role_id ->
    role(id))

client(id, country_id -> country(id), username,
    joining_date, paid_date, item_counter)
country(id, name)
place(id, country_id -> country(id), city, name)
```

1.3 Modelo Objeto-Relacional

1.3.1 Esquema

Figura 2: Uml Class Diagram

1.3.2 Implementação

—— ITEM ——
CREATE TYPE ITEM_T **AS** OBJECT (

3

```sql
   id              INTEGER,
   published_date  TIMESTAMP,
   title           NVARCHAR2(400),
   text            CLOB
);

CREATE TYPE ITEM_REF_TAB_T AS TABLE OF REF ITEM_T;

ALTER TYPE ITEM_T ADD ATTRIBUTE ( related_items
    ITEM_REF_TAB_T ) CASCADE;

-- SECTION --
CREATE TYPE SECTION_T AS OBJECT (
   id   INTEGER,
   name NVARCHAR2(200)
);

ALTER TYPE ITEM_T ADD ATTRIBUTE ( section REF
    SECTION_T ) CASCADE;

-- IMAGE --
CREATE TYPE IMAGE_T AS OBJECT (
   id              INTEGER,
   produced_date   TIMESTAMP,
   title           NVARCHAR2(300),
   file_size       NUMBER,
   url             URITYPE
) NOT FINAL;

CREATE TYPE IMAGE_REF_TAB_T AS TABLE OF REF IMAGE_T;

ALTER TYPE ITEM_T ADD ATTRIBUTE ( images
    IMAGE_REF_TAB_T ) CASCADE;

-- CARTOON --
CREATE TYPE CARTOON_T UNDER IMAGE_T();

-- INFOGRAM --
CREATE TYPE INFOGRAM_T UNDER IMAGE_T();

-- PHOTO --
CREATE TYPE PHOTO_T UNDER IMAGE_T();

-- VIDEO --
```

```
CREATE TYPE VIDEO_T AS OBJECT (
    id              INTEGER,
    recorded_date TIMESTAMP,
    title           NVARCHAR2(200),
    duration        NUMBER,
    url             URITYPE
);

CREATE TYPE VIDEO_REF_TAB_T AS TABLE OF REF VIDEO_T;

ALTER TYPE ITEM_T ADD ATTRIBUTE (videos
    VIDEO_REF_TAB_T ) CASCADE;

-- JOURNALIST --
CREATE TYPE JOURNALIST_T AS OBJECT (
    id              INTEGER,
    name            NVARCHAR2(250),
    professional_id NCHAR(30)
);

ALTER TYPE IMAGE_T ADD ATTRIBUTE (journalist REF
    JOURNALIST_T ) CASCADE;
ALTER TYPE VIDEO_T ADD ATTRIBUTE (journalist REF
    JOURNALIST_T ) CASCADE;

-- PLACE --
CREATE TYPE PLACE_T AS OBJECT (
    id   INTEGER,
    city NVARCHAR2(300),
    name NVARCHAR2(500)
);

ALTER TYPE VIDEO_T ADD ATTRIBUTE (place REF PLACE_T )
    CASCADE;
ALTER TYPE PHOTO_T ADD ATTRIBUTE (place REF PLACE_T )
    CASCADE;

-- CATEGORY --
CREATE TYPE CATEGORY_T AS OBJECT (
    id   INTEGER,
    name NVARCHAR2(200)
);

ALTER TYPE JOURNALIST_T ADD ATTRIBUTE (category REF
```

```
    CATEGORY_T ) CASCADE;

-- ROLE --
CREATE TYPE ROLE_T AS OBJECT (
   id    INTEGER,
   name NVARCHAR2(300)
);

CREATE TYPE JOURNALIST_ROLE_T AS OBJECT (
   journalist       REF JOURNALIST_T,
   journalist_role REF ROLE_T
);

CREATE TYPE JOURNALIST_ROLE_TAB_T AS TABLE OF
   JOURNALIST_ROLE_T;

ALTER TYPE ITEM_T ADD ATTRIBUTE (journalist_role_set
   JOURNALIST_ROLE_TAB_T ) CASCADE;

-- CLIENT --
CREATE TYPE CLIENT_T AS OBJECT (
   id             INTEGER,
   username       NVARCHAR2(100),
   joining_date TIMESTAMP,
   paid_date     TIMESTAMP,
   item_counter INTEGER
);

-- DOWNLOADED_ITEM --
CREATE TYPE DOWNLOADED_ITEM_T AS OBJECT (
   downloaded_item REF ITEM_T,
   download_date    TIMESTAMP
);

CREATE TYPE DOWNLOADED_ITEM_TAB_T AS TABLE OF
   DOWNLOADED_ITEM_T;

ALTER TYPE CLIENT_T ADD ATTRIBUTE (downloaded_items
   DOWNLOADED_ITEM_TAB_T ) CASCADE;

-- COUNTRY --
CREATE TYPE COUNTRY_T AS OBJECT (
   id    INTEGER,
   name NVARCHAR2(100)
```

```
);

ALTER TYPE PLACE_T ADD ATTRIBUTE (country REF
    COUNTRY_T ) CASCADE;
ALTER TYPE JOURNALIST_T ADD ATTRIBUTE (country REF
    COUNTRY_T ) CASCADE;
ALTER TYPE CLIENT_T ADD ATTRIBUTE (country REF
    COUNTRY_T ) CASCADE;


————— TABLES —————
CREATE TABLE item_table OF ITEM_T
  NESTED TABLE related_items STORE AS
      item_related_items_nt
  NESTED TABLE images STORE AS item_images_nt
  NESTED TABLE videos STORE AS item_videos_nt
  NESTED TABLE journalist_role_set STORE AS
      item_journalist_role_set_nt;

CREATE TABLE section_table OF SECTION_T;

CREATE TABLE image_table OF IMAGE_T;

CREATE TABLE video_table OF VIDEO_T;

CREATE TABLE journalist_table OF JOURNALIST_T;

CREATE TABLE category_table OF CATEGORY_T;

CREATE TABLE place_table OF PLACE_T;

CREATE TABLE country_table OF COUNTRY_T;

CREATE TABLE role_table OF ROLE_T;

CREATE TABLE client_table OF CLIENT_T
  NESTED TABLE downloaded_items STORE AS
      client_downloaded_items_nt;
```

2   Prepare an instance for the DB

```
-- SECTION
INSERT INTO section_table VALUES (1, 'World');
INSERT INTO section_table VALUES (2, 'Politics');
INSERT INTO section_table VALUES (3, 'Business');
```

```sql
INSERT INTO section_table VALUES (4, 'Opinion');
INSERT INTO section_table VALUES (5, 'Technology');
INSERT INTO section_table VALUES (6, 'Science');
INSERT INTO section_table VALUES (7, 'Health');
INSERT INTO section_table VALUES (8, 'Sports');
INSERT INTO section_table VALUES (9, 'Arts');

-- CATEGORY
INSERT INTO category_table VALUES (1, 'Freelance␣
    journalism');
INSERT INTO category_table VALUES (2, 'Analytic␣
    journalism');
INSERT INTO category_table VALUES (3, 'Comedic␣
    journalism');
INSERT INTO category_table VALUES (4, 'Community␣
    journalism');
INSERT INTO category_table VALUES (5, 'Computational␣
    journalism');
INSERT INTO category_table VALUES (6, 'Enterprise␣
    journalism');

-- ROLE
INSERT INTO role_table VALUES (1, 'Main␣Reporter');
INSERT INTO role_table VALUES (2, 'Editor');
INSERT INTO role_table VALUES (3, 'Columnist');
INSERT INTO role_table VALUES (4, 'Blogger');
INSERT INTO role_table VALUES (5, 'Photographer');
INSERT INTO role_table VALUES (6, 'Collaborator,');

-- COUNTRY
INSERT INTO country_table VALUES (1, 'Portugal');
INSERT INTO country_table VALUES (2, 'Spain');
INSERT INTO country_table VALUES (3, 'France');
INSERT INTO country_table VALUES (4, 'Germany');
INSERT INTO country_table VALUES (5, 'United␣
    Kingdom');
INSERT INTO country_table VALUES (6, 'Belgium');
INSERT INTO country_table VALUES (7, 'The␣
    Netherlands');
INSERT INTO country_table VALUES (8, 'Russia');
INSERT INTO country_table VALUES (9, 'United␣States␣
    of␣America');

-- JOURNALIST
```

```sql
INSERT INTO journalist_table VALUES (1, 'José␣Nunes␣
    Lopes', '385649285174209', (SELECT REF(p) FROM
    category_table p WHERE id=6), (SELECT REF(p) FROM
    country_table p WHERE id=2));
INSERT INTO journalist_table VALUES (2, 'Clara␣Silva␣
    Lima', '403748039483245', (SELECT REF(p) FROM
    category_table p WHERE id=3), (SELECT REF(p) FROM
    country_table p WHERE id=5));
INSERT INTO journalist_table VALUES (3, 'Hugo␣
    Fernandes␣Almeida', '582064401853729', (SELECT
    REF(p) FROM category_table p WHERE id=1), (SELECT
    REF(p) FROM country_table p WHERE id=8));
INSERT INTO journalist_table VALUES (4, 'Guilherme␣
    Ribeiro␣Dias', '401358289582293', (SELECT REF(p)
    FROM category_table p WHERE id=2), (SELECT REF(p)
    FROM country_table p WHERE id=6));
INSERT INTO journalist_table VALUES (5, 'Filipe␣
    Martins␣Rodrigues', '382387596342312', (SELECT
    REF(p) FROM category_table p WHERE id=4), (SELECT
    REF(p) FROM country_table p WHERE id=1));
INSERT INTO journalist_table VALUES (6, 'Igor␣Sousa␣
    Cunha', '295062196039212', (SELECT REF(p) FROM
    category_table p WHERE id=1), (SELECT REF(p) FROM
    country_table p WHERE id=4));
INSERT INTO journalist_table VALUES (7, 'Margarida␣
    PINTO␣Barbosa', '045872348942372', (SELECT REF(p)
    FROM category_table p WHERE id=3), (SELECT REF(p)
    FROM country_table p WHERE id=5));
INSERT INTO journalist_table VALUES (8, 'Rodrigo␣
    Araújo␣Gonçalves', '560480293484723', (SELECT
    REF(p) FROM category_table p WHERE id=3), (SELECT
    REF(p) FROM country_table p WHERE id=9));
INSERT INTO journalist_table VALUES (9, 'Daniela␣Lima␣
    Costa', '593295810321850', (SELECT REF(p) FROM
    category_table p WHERE id=5), (SELECT REF(p) FROM
    country_table p WHERE id=2));


-- PLACE
INSERT INTO place_table VALUES (1, 'Lisbon', 'Parque␣
    florestal␣de␣Monsanto', (SELECT REF(p) FROM
    country_table p WHERE id=1));
INSERT INTO place_table VALUES (2, 'Porto',
    'Clerigos', (SELECT REF(p) FROM country_table p
```

```sql
WHERE id=1));
INSERT INTO place_table VALUES (3, 'Berlin',
    'Cora-Berliner-Straße', (SELECT REF(p) FROM
    country_table p WHERE id=4));
INSERT INTO place_table VALUES (4, 'London', 'Big␣
    Ben', (SELECT REF(p) FROM country_table p WHERE
    id=5));
INSERT INTO place_table VALUES (5, 'Brussels',
    'Avenue␣de␣Atomium', (SELECT REF(p) FROM
    country_table p WHERE id=6));
INSERT INTO place_table VALUES (6, 'Amsterdam',
    'Grachtengordel', (SELECT REF(p) FROM
    country_table p WHERE id=7));
INSERT INTO place_table VALUES (7, 'Chicago', 'Willis␣
    Tower', (SELECT REF(p) FROM country_table p WHERE
    id=9));
INSERT INTO place_table VALUES (8, 'Moscow',
    'Kremlin', (SELECT REF(p) FROM country_table p
    WHERE id=8));
INSERT INTO place_table VALUES (9, 'Paris',
    'Champs-Élysées␣Avenue', (SELECT REF(p) FROM
    country_table p WHERE id=3));


-- IMAGE
INSERT INTO image_table VALUES (photo_t(1,
    TO_TIMESTAMP('2017-05-03␣23:55:00', 'YYYY-MM-DD␣
    HH24:MI:SS'), 'Flowers␣during␣Spring', 42351,
    httpuritype.createuri('http://www.sitedenoticias.com/images/flowers_du
    (SELECT REF(p) FROM journalist_table p WHERE
    id=3), (SELECT REF(p) FROM place_table p WHERE
    id=1)));
INSERT INTO image_table VALUES (photo_t(2,
    TO_TIMESTAMP('2017-04-26␣20:30:00', 'YYYY-MM-DD␣
    HH24:MI:SS'), 'Big␣Ben␣at␣Summer', 63427,
    httpuritype.createuri('http://www.sitedenoticias.com/images/big_ben_at_
    (SELECT REF(p) FROM journalist_table p WHERE
    id=6), (SELECT REF(p) FROM place_table p WHERE
    id=4)));
INSERT INTO image_table VALUES (photo_t(3,
    TO_TIMESTAMP('2017-02-18␣14:20:00', 'YYYY-MM-DD␣
    HH24:MI:SS'), 'The␣lovely␣canals', 14549,
    httpuritype.createuri('http://www.sitedenoticias.com/images/the_lovely
```

```
                      (SELECT REF(p) FROM journalist_table p WHERE
   id=2), (SELECT REF(p) FROM place_table p WHERE
   id=6)));
INSERT INTO image_table VALUES (photo_t(4,
   TO_TIMESTAMP('2017-02-11 17:15:00', 'YYYY-MM-DD
   HH24:MI:SS'), 'Willis Tower covered in snow',
   23495,
   httpuritype.createuri('http://www.sitedenoticias.com/images/willis_towe
   (SELECT REF(p) FROM journalist_table p WHERE
   id=7), (SELECT REF(p) FROM place_table p WHERE
   id=7)));
INSERT INTO image_table VALUES (cartoon_t(5,
   TO_TIMESTAMP('2017-02-09 09:50:00', 'YYYY-MM-DD
   HH24:MI:SS'), 'Cartoon of Marcelo Rebelo de
   Sousa', 93012,
   httpuritype.createuri('http://www.sitedenoticias.com/images/cartoon_of_
   (SELECT REF(p) FROM journalist_table p WHERE
   id=1)));
INSERT INTO image_table VALUES (cartoon_t(6,
   TO_TIMESTAMP('2017-02-03 08:35:00', 'YYYY-MM-DD
   HH24:MI:SS'), 'Cartoon of Agir', 29143,
   httpuritype.createuri('http://www.sitedenoticias.com/images/cartoon_of
   (SELECT REF(p) FROM journalist_table p WHERE
   id=7)));
INSERT INTO image_table VALUES (cartoon_t(7,
   TO_TIMESTAMP('2017-01-28 12:25:00', 'YYYY-MM-DD
   HH24:MI:SS'), 'Cartoon of Cristiano Ronaldo',
   73012,
   httpuritype.createuri('http://www.sitedenoticias.com/images/cartoon_of
   (SELECT REF(p) FROM journalist_table p WHERE
   id=8)));
INSERT INTO image_table VALUES (infogram_t(8,
   TO_TIMESTAMP('2017-01-19 19:45:00', 'YYYY-MM-DD
   HH24:MI:SS'), 'Infogram about demographics',
   93012,
   httpuritype.createuri('http://www.sitedenoticias.com/images/infogram_a
   (SELECT REF(p) FROM journalist_table p WHERE
   id=5)));
INSERT INTO image_table VALUES (infogram_t(9,
   TO_TIMESTAMP('2017-01-03 21:05:00', 'YYYY-MM-DD
   HH24:MI:SS'), 'Infogram about Horror Movies',
   93012,
   httpuritype.createuri('http://www.sitedenoticias.com/images/infogram_a
   (SELECT REF(p) FROM journalist_table p WHERE
```

```
        id=9)));


      −− VIDEO
      INSERT INTO video_table VALUES (1 ,
          TO_TIMESTAMP( '2017−05−03␣23:55:00 ' , 'YYYY−MM−DD␣
          HH24:MI:SS ' ) , 'Kids␣dancing ' , 312 ,
          httpuritype.createuri ( 'http://www.sitedenoticias.com/videos/kids_danci
          (SELECT REF(p) FROM journalist_table p WHERE
          id=3) , (SELECT REF(p) FROM place_table p WHERE
          id=7));
      INSERT INTO video_table VALUES (2 ,
          TO_TIMESTAMP( '2017−04−26␣20:30:00 ' , 'YYYY−MM−DD␣
          HH24:MI:SS ' ) , 'Man␣jumping ' , 278 ,
          httpuritype.createuri ( 'http://www.sitedenoticias.com/videos/man_jumpin
          (SELECT REF(p) FROM journalist_table p WHERE
          id=6) , (SELECT REF(p) FROM place_table p WHERE
          id=2));
      INSERT INTO video_table VALUES (3 ,
          TO_TIMESTAMP( '2017−02−18␣14:20:00 ' , 'YYYY−MM−DD␣
          HH24:MI:SS ' ) , 'Car␣speeding ' , 180 ,
          httpuritype.createuri ( 'http://www.sitedenoticias.com/videos/car_speedi
          (SELECT REF(p) FROM journalist_table p WHERE
          id=2) , (SELECT REF(p) FROM place_table p WHERE
          id=4));
      INSERT INTO video_table VALUES (4 ,
          TO_TIMESTAMP( '2017−02−11␣17:15:00 ' , 'YYYY−MM−DD␣
          HH24:MI:SS ' ) , 'Football␣match ' , 19000 ,
          httpuritype.createuri ( 'http://www.sitedenoticias.com/videos/football_m
          (SELECT REF(p) FROM journalist_table p WHERE
          id=7) , (SELECT REF(p) FROM place_table p WHERE
          id=1));
      INSERT INTO video_table VALUES (5 ,
          TO_TIMESTAMP( '2017−02−09␣09:50:00 ' , 'YYYY−MM−DD␣
          HH24:MI:SS ' ) , 'Albert␣Einstein␣interview ' , 234 ,
          httpuritype.createuri ( 'http://www.sitedenoticias.com/videos/albert_ein
          (SELECT REF(p) FROM journalist_table p WHERE
          id=1) , (SELECT REF(p) FROM place_table p WHERE
          id=3));
      INSERT INTO video_table VALUES (6 ,
          TO_TIMESTAMP( '2017−02−03␣08:35:00 ' , 'YYYY−MM−DD␣
          HH24:MI:SS ' ) , 'Guy␣programming ' , 540 ,
          httpuritype.createuri ( 'http://www.sitedenoticias.com/videos/guy_progra
          (SELECT REF(p) FROM journalist_table p WHERE
```

```sql
    id=7), (SELECT REF(p) FROM place_table p WHERE
    id=8));
INSERT INTO video_table VALUES (7,
    TO_TIMESTAMP('2017-01-28 12:25:00', 'YYYY-MM-DD
    HH24:MI:SS'), 'Woman writting', 207,
    httpuritype.createuri('http://www.sitedenoticias.com/videos/woman_wri
    (SELECT REF(p) FROM journalist_table p WHERE
    id=8), (SELECT REF(p) FROM place_table p WHERE
    id=9));
INSERT INTO video_table VALUES (8,
    TO_TIMESTAMP('2017-01-19 19:45:00', 'YYYY-MM-DD
    HH24:MI:SS'), 'People eating', 731,
    httpuritype.createuri('http://www.sitedenoticias.com/videos/people_eat
    (SELECT REF(p) FROM journalist_table p WHERE
    id=5), (SELECT REF(p) FROM place_table p WHERE
    id=5));
INSERT INTO video_table VALUES (9,
    TO_TIMESTAMP('2017-01-03 21:05:00', 'YYYY-MM-DD
    HH24:MI:SS'), 'Enya singing', 239,
    httpuritype.createuri('http://www.sitedenoticias.com/videos/enya_singi
    (SELECT REF(p) FROM journalist_table p WHERE
    id=9), (SELECT REF(p) FROM place_table p WHERE
    id=4));


-- ITEM
INSERT INTO item_table VALUES (
     1,
     TO_TIMESTAMP('2017-05-01 23:55:00', 'YYYY-MM-DD
        HH24:MI:SS'),
     'Trump Says the Government Needs a "Good
        Shutdown"',
     'President Trump said on Tuesday that the United
        States needed "a good shutdown" this fall to
        force a partisan confrontation over federal
        spending, and suggested that he might move to
        reverse longstanding Senate rules that
        effectively require a supermajority to approve
        most major pieces of legislation.',
     ITEM_REF_TAB_T(),
     (SELECT REF(p) FROM section_table p WHERE id=2),
     IMAGE_REF_TAB_T((SELECT REF(d) FROM image_table d
        WHERE d.id=4), (SELECT REF(d) FROM image_table
        d WHERE d.id=6)),
```

```sql
      VIDEO_REF_TAB_T((SELECT REF(d) FROM video_table d
         WHERE d.id=2)),
      JOURNALIST_ROLE_TAB_T(JOURNALIST_ROLE_T((SELECT
         REF(d) FROM journalist_table d WHERE d.id=3),
         (SELECT REF(d) FROM role_table d WHERE
         d.id=1)))
);
INSERT INTO item_table VALUES (
      2,
      TO_TIMESTAMP('2017-04-26 20:30:00', 'YYYY-MM-DD
         HH24:MI:SS'),
      'Majority of Mélenchon supporters will not back
         Emmanuel Macron',
      'Poll suggests 65% of those who backed hard-left
         candidate will not vote for centrist fighting
         Marine Le Pen for French presidency',
      ITEM_REF_TAB_T(),
      (SELECT REF(p) FROM section_table p WHERE id=1),
      IMAGE_REF_TAB_T((SELECT REF(d) FROM image_table d
         WHERE d.id=7)),
      VIDEO_REF_TAB_T((SELECT REF(d) FROM video_table d
         WHERE d.id=3), (SELECT REF(d) FROM video_table
         d WHERE d.id=7)),
      JOURNALIST_ROLE_TAB_T(JOURNALIST_ROLE_T((SELECT
         REF(d) FROM journalist_table d WHERE d.id=6),
         (SELECT REF(d) FROM role_table d WHERE
         d.id=3)), JOURNALIST_ROLE_T((SELECT REF(d)
         FROM journalist_table d WHERE d.id=7), (SELECT
         REF(d) FROM role_table d WHERE d.id=5)))
);
INSERT INTO item_table VALUES (
      3,
      TO_TIMESTAMP('2017-02-18 14:20:00', 'YYYY-MM-DD
         HH24:MI:SS'),
      'Merkel presses Putin over anti-gay purge in
         Chechnya',
      'German chancellor raises reports of torture and
         persecution of gay men during joint press
         conference with Russian president',
      ITEM_REF_TAB_T(),
      (SELECT REF(p) FROM section_table p WHERE id=4),
      IMAGE_REF_TAB_T((SELECT REF(d) FROM image_table d
         WHERE d.id=1), (SELECT REF(d) FROM image_table
         d WHERE d.id=5)),
```

```sql
        VIDEO_REF_TAB_T((SELECT REF(d) FROM video_table d
            WHERE d.id=9), (SELECT REF(d) FROM video_table
            d WHERE d.id=1)),
        JOURNALIST_ROLE_TAB_T(JOURNALIST_ROLE_T((SELECT
            REF(d) FROM journalist_table d WHERE d.id=2),
            (SELECT REF(d) FROM role_table d WHERE
            d.id=5)))
);
INSERT INTO item_table VALUES (
        4,
        TO_TIMESTAMP('2017-02-11 17:15:00', 'YYYY-MM-DD
            HH24:MI:SS'),
        '"Exercise pill" could deliver benefits of
            fitness in tablet form',
        'Drug could transform lives of those who are
            unable to exercise because of obesity or
            serious physical disability, mouse study
            suggests',
        ITEM_REF_TAB_T(),
        (SELECT REF(p) FROM section_table p WHERE id=7),
        IMAGE_REF_TAB_T(),
        VIDEO_REF_TAB_T((SELECT REF(d) FROM video_table d
            WHERE d.id=6)),
        JOURNALIST_ROLE_TAB_T(JOURNALIST_ROLE_T((SELECT
            REF(d) FROM journalist_table d WHERE d.id=7),
            (SELECT REF(d) FROM role_table d WHERE
            d.id=1)))
);
INSERT INTO item_table VALUES (
        5,
        TO_TIMESTAMP('2017-02-09 09:50:00', 'YYYY-MM-DD
            HH24:MI:SS'),
        'FBI translator married Isis recruiter she was
            meant to be investigating',
        'Daniela Greene moved to Syria to be with her
            jihadi groom, a former German rapper, before
            realising she was involved "way over her
            head"',
        ITEM_REF_TAB_T(),
        (SELECT REF(p) FROM section_table p WHERE id=6),
        IMAGE_REF_TAB_T((SELECT REF(d) FROM image_table d
            WHERE d.id=2)),
        VIDEO_REF_TAB_T((SELECT REF(d) FROM video_table d
            WHERE d.id=5)),
```

```
JOURNALIST_ROLE_TAB_T(JOURNALIST_ROLE_T((SELECT
    REF(d) FROM journalist_table d WHERE d.id=8),
    (SELECT REF(d) FROM role_table d WHERE
    d.id=2)))
);
INSERT INTO item_table VALUES (
    6,
    TO_TIMESTAMP( '2017−02−03 08:35:00 ', 'YYYY−MM−DD
        HH24:MI:SS '),
    'May: Juncker will find me "bloody difficult
        woman" in Brexit talks ',
    'Comment comes as cabinet source brands decision
        to leak details of PMs dinner with European
        commission chief a "miscalculation " ',
    ITEM_REF_TAB_T(),
    (SELECT REF(p) FROM section_table p WHERE id=7),
    IMAGE_REF_TAB_T(),
    VIDEO_REF_TAB_T(),
    JOURNALIST_ROLE_TAB_T(JOURNALIST_ROLE_T((SELECT
        REF(d) FROM journalist_table d WHERE d.id=8),
        (SELECT REF(d) FROM role_table d WHERE
        d.id=2)), JOURNALIST_ROLE_T((SELECT REF(d)
        FROM journalist_table d WHERE d.id=5), (SELECT
        REF(d) FROM role_table d WHERE d.id=6)))
);
INSERT INTO item_table VALUES (
    7,
    TO_TIMESTAMP( '2017−01−28 12:25:00 ', 'YYYY−MM−DD
        HH24:MI:SS '),
    'Jaber Abdullah: how I set up a REFugee football
        team in Barnsley ',
    'The Sudanese asylum seeker has created a
        50−strong squad to help men stuck in
        immigration limbo in a town that has faced
        anti−immigration marches ',
    ITEM_REF_TAB_T(),
    (SELECT REF(p) FROM section_table p WHERE id=9),
    IMAGE_REF_TAB_T((SELECT REF(d) FROM image_table d
        WHERE d.id=8)),
    VIDEO_REF_TAB_T((SELECT REF(d) FROM video_table d
        WHERE d.id=2)),
    JOURNALIST_ROLE_TAB_T(JOURNALIST_ROLE_T((SELECT
        REF(d) FROM journalist_table d WHERE d.id=2),
        (SELECT REF(d) FROM role_table d WHERE
```

```sql
            d.id=2)))
);
INSERT INTO item_table VALUES (
    8,
    TO_TIMESTAMP('2017-01-19 19:45:00', 'YYYY-MM-DD
        HH24:MI:SS'),
    'Erdoan rejoins Turkeys ruling party in wake of
        REFerendum on new powers',
    'President returns to Justice and Development
        party a fortnight after voters narrowly
        approved constitutional amendments',
    ITEM_REF_TAB_T(),
    (SELECT REF(p) FROM section_table p WHERE id=5),
    IMAGE_REF_TAB_T((SELECT REF(d) FROM image_table d
        WHERE d.id=3)),
    VIDEO_REF_TAB_T((SELECT REF(d) FROM video_table d
        WHERE d.id=8), (SELECT REF(d) FROM video_table
        d WHERE d.id=4)),
    JOURNALIST_ROLE_TAB_T(JOURNALIST_ROLE_T((SELECT
        REF(d) FROM journalist_table d WHERE d.id=3),
        (SELECT REF(d) FROM role_table d WHERE
        d.id=1)), JOURNALIST_ROLE_T((SELECT REF(d)
        FROM journalist_table d WHERE d.id=8), (SELECT
        REF(d) FROM role_table d WHERE d.id=3)))
);
INSERT INTO item_table VALUES (
    9,
    TO_TIMESTAMP('2017-01-03 21:05:00', 'YYYY-MM-DD
        HH24:MI:SS'),
    '"Oldest human" dies in Indonesia aged 146',
    'Indonesia says deceased man was born in December
        1870, although his age was never verified',
    ITEM_REF_TAB_T(),
    (SELECT REF(p) FROM section_table p WHERE id=3),
    IMAGE_REF_TAB_T((SELECT REF(d) FROM image_table d
        WHERE d.id=9), (SELECT REF(d) FROM image_table
        d WHERE d.id=7)),
    VIDEO_REF_TAB_T(),
    JOURNALIST_ROLE_TAB_T(JOURNALIST_ROLE_T((SELECT
        REF(d) FROM journalist_table d WHERE d.id=5),
        (SELECT REF(d) FROM role_table d WHERE
        d.id=4)))
);
```

-- INSERTS NAS TABLEAS DE ITEMS RELACIONADOS EM CADA ITEM
-- ITEM 1
INSERT INTO table(**SELECT** s.related_items **FROM**
    item_table s **WHERE** s.id=1)
(**SELECT** REF(d) **FROM** item_table d **WHERE** d.id=6);
INSERT INTO table(**SELECT** s.related_items **FROM**
    item_table s **WHERE** s.id=1)
(**SELECT** REF(d) **FROM** item_table d **WHERE** d.id=2);
INSERT INTO table(**SELECT** s.related_items **FROM**
    item_table s **WHERE** s.id=1)
(**SELECT** REF(d) **FROM** item_table d **WHERE** d.id=7);
-- ITEM 2
INSERT INTO table(**SELECT** s.related_items **FROM**
    item_table s **WHERE** s.id=2)
(**SELECT** REF(d) **FROM** item_table d **WHERE** d.id=6);
INSERT INTO table(**SELECT** s.related_items **FROM**
    item_table s **WHERE** s.id=2)
(**SELECT** REF(d) **FROM** item_table d **WHERE** d.id=2);
INSERT INTO table(**SELECT** s.related_items **FROM**
    item_table s **WHERE** s.id=2)
(**SELECT** REF(d) **FROM** item_table d **WHERE** d.id=8);
INSERT INTO table(**SELECT** s.related_items **FROM**
    item_table s **WHERE** s.id=2)
(**SELECT** REF(d) **FROM** item_table d **WHERE** d.id=1);
-- ITEM 3
INSERT INTO table(**SELECT** s.related_items **FROM**
    item_table s **WHERE** s.id=3)
(**SELECT** REF(d) **FROM** item_table d **WHERE** d.id=2);
INSERT INTO table(**SELECT** s.related_items **FROM**
    item_table s **WHERE** s.id=3)
(**SELECT** REF(d) **FROM** item_table d **WHERE** d.id=7);
INSERT INTO table(**SELECT** s.related_items **FROM**
    item_table s **WHERE** s.id=3)
(**SELECT** REF(d) **FROM** item_table d **WHERE** d.id=4);
INSERT INTO table(**SELECT** s.related_items **FROM**
    item_table s **WHERE** s.id=3)
(**SELECT** REF(d) **FROM** item_table d **WHERE** d.id=5);
-- ITEM 4
INSERT INTO table(**SELECT** s.related_items **FROM**
    item_table s **WHERE** s.id=4)
(**SELECT** REF(d) **FROM** item_table d **WHERE** d.id=5);
INSERT INTO table(**SELECT** s.related_items **FROM**

```
                item_table s WHERE s.id=4)
 (SELECT REF(d) FROM item_table d WHERE d.id=9);
INSERT INTO table(SELECT s.related_items FROM
     item_table s WHERE s.id=4)
 (SELECT REF(d) FROM item_table d WHERE d.id=1);
-- ITEM 5
INSERT INTO table(SELECT s.related_items FROM
     item_table s WHERE s.id=5)
 (SELECT REF(d) FROM item_table d WHERE d.id=3);
INSERT INTO table(SELECT s.related_items FROM
     item_table s WHERE s.id=5)
 (SELECT REF(d) FROM item_table d WHERE d.id=8);
INSERT INTO table(SELECT s.related_items FROM
     item_table s WHERE s.id=5)
 (SELECT REF(d) FROM item_table d WHERE d.id=7);
INSERT INTO table(SELECT s.related_items FROM
     item_table s WHERE s.id=5)
 (SELECT REF(d) FROM item_table d WHERE d.id=1);
-- ITEM 6
INSERT INTO table(SELECT s.related_items FROM
     item_table s WHERE s.id=6)
 (SELECT REF(d) FROM item_table d WHERE d.id=1);
INSERT INTO table(SELECT s.related_items FROM
     item_table s WHERE s.id=6)
 (SELECT REF(d) FROM item_table d WHERE d.id=4);
INSERT INTO table(SELECT s.related_items FROM
     item_table s WHERE s.id=6)
 (SELECT REF(d) FROM item_table d WHERE d.id=2);
-- ITEM 7
INSERT INTO table(SELECT s.related_items FROM
     item_table s WHERE s.id=7)
 (SELECT REF(d) FROM item_table d WHERE d.id=9);
INSERT INTO table(SELECT s.related_items FROM
     item_table s WHERE s.id=7)
 (SELECT REF(d) FROM item_table d WHERE d.id=2);
INSERT INTO table(SELECT s.related_items FROM
     item_table s WHERE s.id=7)
 (SELECT REF(d) FROM item_table d WHERE d.id=6);
-- ITEM 8
INSERT INTO table(SELECT s.related_items FROM
     item_table s WHERE s.id=8)
 (SELECT REF(d) FROM item_table d WHERE d.id=2);
INSERT INTO table(SELECT s.related_items FROM
     item_table s WHERE s.id=8)
```

```sql
(SELECT REF(d) FROM item_table d WHERE d.id=5);
INSERT INTO table(SELECT s.related_items FROM
    item_table s WHERE s.id=8)
(SELECT REF(d) FROM item_table d WHERE d.id=1);
INSERT INTO table(SELECT s.related_items FROM
    item_table s WHERE s.id=8)
(SELECT REF(d) FROM item_table d WHERE d.id=3);
INSERT INTO table(SELECT s.related_items FROM
    item_table s WHERE s.id=8)
(SELECT REF(d) FROM item_table d WHERE d.id=9);
-- ITEM 9
INSERT INTO table(SELECT s.related_items FROM
    item_table s WHERE s.id=9)
(SELECT REF(d) FROM item_table d WHERE d.id=1);
INSERT INTO table(SELECT s.related_items FROM
    item_table s WHERE s.id=9)
(SELECT REF(d) FROM item_table d WHERE d.id=7);
INSERT INTO table(SELECT s.related_items FROM
    item_table s WHERE s.id=9)
(SELECT REF(d) FROM item_table d WHERE d.id=5);


-- CLIENT
INSERT INTO client_table VALUES (
    1,
    'clarita12',
    TO_TIMESTAMP('2016-12-03 23:55:00', 'YYYY-MM-DD
        HH24:MI:SS'),
    TO_TIMESTAMP('2017-04-15 12:25:00', 'YYYY-MM-DD
        HH24:MI:SS'),
    13,
    DOWNLOADED_ITEM_TAB_T(DOWNLOADED_ITEM_T((SELECT
        REF(d) FROM item_table d WHERE d.id=5),
        TO_TIMESTAMP('2017-02-10 09:50:00',
        'YYYY-MM-DD HH24:MI:SS')),
                            DOWNLOADED_ITEM_T((SELECT
                                REF(d) FROM item_table d
                                WHERE d.id=8),
                                TO_TIMESTAMP('2017-01-20
                                19:45:00', 'YYYY-MM-DD
                                HH24:MI:SS')),
                            DOWNLOADED_ITEM_T((SELECT
                                REF(d) FROM item_table d
                                WHERE d.id=1),
```

```
                                              TO_TIMESTAMP( '2017−05−02␣
                                              23:55:00 ', 'YYYY−MM−DD␣
                                              HH24:MI:SS'))),
      (SELECT REF(p) FROM country_table p WHERE p.id=3)
);
INSERT INTO client_table VALUES (
      2,
      'sialoquent74 ',
      TO_TIMESTAMP( '2016−09−16␣14:48:00 ', 'YYYY−MM−DD␣
          HH24:MI:SS'),
      TO_TIMESTAMP( '2017−04−19␣10:39:00 ', 'YYYY−MM−DD␣
          HH24:MI:SS'),
      4,
      DOWNLOADED_ITEM_TAB_T(DOWNLOADED_ITEM_T((SELECT
          REF(d) FROM item_table d WHERE d.id=3),
          TO_TIMESTAMP( '2017−02−18␣14:20:00 ',
          'YYYY−MM−DD␣HH24:MI:SS')),
                                    DOWNLOADED_ITEM_T((SELECT
                                        REF(d) FROM item_table d
                                        WHERE d.id=7),
                                        TO_TIMESTAMP( '2017−01−28␣
                                        12:25:00 ', 'YYYY−MM−DD␣
                                        HH24:MI:SS'))),
      (SELECT REF(p) FROM country_table p WHERE p.id=8)
);
INSERT INTO client_table VALUES (
      3,
      'lugubrious46 ',
      TO_TIMESTAMP( '2016−08−31␣06:37:00 ', 'YYYY−MM−DD␣
          HH24:MI:SS'),
      TO_TIMESTAMP( '2017−04−12␣19:28:00 ', 'YYYY−MM−DD␣
          HH24:MI:SS'),
      9,
      DOWNLOADED_ITEM_TAB_T(DOWNLOADED_ITEM_T((SELECT
          REF(d) FROM item_table d WHERE d.id=1),
          TO_TIMESTAMP( '2017−05−03␣10:35:00 ',
          'YYYY−MM−DD␣HH24:MI:SS')),
                                    DOWNLOADED_ITEM_T((SELECT
                                        REF(d) FROM item_table d
                                        WHERE d.id=6),
                                        TO_TIMESTAMP( '2017−02−04␣
                                        08:35:00 ', 'YYYY−MM−DD␣
                                        HH24:MI:SS')),
                                    DOWNLOADED_ITEM_T((SELECT
```

```sql
                                    REF(d) FROM item_table d
                                    WHERE d.id=3),
                                    TO_TIMESTAMP('2017-02-19
                                    14:20:00', 'YYYY-MM-DD
                                    HH24:MI:SS'))),
        (SELECT REF(p) FROM country_table p WHERE p.id=6)
);
INSERT INTO client_table VALUES (
        4,
        'filibuster89',
        TO_TIMESTAMP('2016-11-12 23:11:00', 'YYYY-MM-DD
            HH24:MI:SS'),
        TO_TIMESTAMP('2017-03-09 17:05:00', 'YYYY-MM-DD
            HH24:MI:SS'),
        14,
        DOWNLOADED_ITEM_TAB_T(DOWNLOADED_ITEM_T((SELECT
            REF(d) FROM item_table d WHERE d.id=4),
            TO_TIMESTAMP('2017-02-12 17:15:00',
            'YYYY-MM-DD HH24:MI:SS')),
                            DOWNLOADED_ITEM_T((SELECT
                                REF(d) FROM item_table d
                                WHERE d.id=9),
                                TO_TIMESTAMP('2017-01-04
                                21:05:00', 'YYYY-MM-DD
                                HH24:MI:SS'))),
        (SELECT REF(p) FROM country_table p WHERE p.id=4)
);
INSERT INTO client_table VALUES (
        5,
        'ranivorous69',
        TO_TIMESTAMP('2016-03-05 21:58:00', 'YYYY-MM-DD
            HH24:MI:SS'),
        TO_TIMESTAMP('2017-04-20 15:05:00', 'YYYY-MM-DD
            HH24:MI:SS'),
        19,
        DOWNLOADED_ITEM_TAB_T(DOWNLOADED_ITEM_T((SELECT
            REF(d) FROM item_table d WHERE d.id=3),
            TO_TIMESTAMP('2017-02-20 14:20:00',
            'YYYY-MM-DD HH24:MI:SS')),
                            DOWNLOADED_ITEM_T((SELECT
                                REF(d) FROM item_table d
                                WHERE d.id=7),
                                TO_TIMESTAMP('2017-01-29
                                12:25:00', 'YYYY-MM-DD
```

```
                                HH24:MI:SS')),
                        DOWNLOADED_ITEM_T((SELECT
                            REF(d) FROM item_table d
                            WHERE d.id=5),
                            TO_TIMESTAMP('2017-02-11
                            09:50:00', 'YYYY-MM-DD
                            HH24:MI:SS')))),
        (SELECT REF(p) FROM country_table p WHERE p.id=1)
);
INSERT INTO client_table VALUES (
        6,
        'nambypamby14',
        TO_TIMESTAMP('2016-05-19 18:29:00', 'YYYY-MM-DD
            HH24:MI:SS'),
        TO_TIMESTAMP('2017-04-25 11:43:00', 'YYYY-MM-DD
            HH24:MI:SS'),
        3,
        DOWNLOADED_ITEM_TAB_T(DOWNLOADED_ITEM_T((SELECT
            REF(d) FROM item_table d WHERE d.id=6),
            TO_TIMESTAMP('2017-02-05 08:35:00',
            'YYYY-MM-DD HH24:MI:SS')),
                        DOWNLOADED_ITEM_T((SELECT
                            REF(d) FROM item_table d
                            WHERE d.id=2),
                            TO_TIMESTAMP('2017-04-27
                            20:30:00', 'YYYY-MM-DD
                            HH24:MI:SS'))),
        (SELECT REF(p) FROM country_table p WHERE p.id=9)
);
INSERT INTO client_table VALUES (
        7,
        'troglodyte36',
        TO_TIMESTAMP('2016-11-17 18:47:00', 'YYYY-MM-DD
            HH24:MI:SS'),
        TO_TIMESTAMP('2017-03-10 09:18:00', 'YYYY-MM-DD
            HH24:MI:SS'),
        7,
        DOWNLOADED_ITEM_TAB_T(DOWNLOADED_ITEM_T((SELECT
            REF(d) FROM item_table d WHERE d.id=5),
            TO_TIMESTAMP('2017-02-12 09:50:00',
            'YYYY-MM-DD HH24:MI:SS')),
                        DOWNLOADED_ITEM_T((SELECT
                            REF(d) FROM item_table d
                            WHERE d.id=2),
```

23

```
                              TO_TIMESTAMP( ' 2017−04−28⎵
                              20:30:00 ' ,  'YYYY–MM-DD⎵
                              HH24:MI:SS ' ) ) ,
                      DOWNLOADED_ITEM_T((SELECT
                          REF( d ) FROM item_table d
                          WHERE d . id =8) ,
                          TO_TIMESTAMP( ' 2017−01−21⎵
                          19:45:00 ' ,  'YYYY–MM-DD⎵
                          HH24:MI:SS ' ) ) ) ,
          (SELECT REF( p ) FROM country_table p WHERE p . id =8)
) ;
```

3 Add an ordering method for the news base on descending date and, for each day, on the of previous downloads, also descending

4 Prepare a query that, given the reader and a day presents the titles of the photos he has seen

```
−− d )
SELECT value( p ) . title as image_title
FROM TABLE (SELECT v . downloaded_item . images
              FROM TABLE (SELECT c . downloaded_items
                            FROM client_table c
                            WHERE c . username =
                                ' lugubrious46 ' ) v
              WHERE v . downloaded_item . published_date =
                  TO_TIMESTAMP( ' 2017−05−01⎵23:55:00 ' ,
                  'YYYY–MM-DD⎵HH24:MI:SS ' ) ) p ;
−−           WHERE v . download_date =
     TO_TIMESTAMP( ' 2017−05−03  10:35:00 ' ,  'YYYY–MM-DD
     HH24:MI:SS ' ) )  p ;
```

5 List the production of each journalist, including statistics