



- L3 MIASHS/Ingémath/METIS
- Université Paris Cité
- Année 2024-2025
- Course Homepage
- Moodle

⚠ Toutes les questions portent sur les schémas `pagila` et `world` rappelés ci-dessous.  
Pour chaque question, proposer une requête écrite en algèbre relationnelle *OU* en SQL.

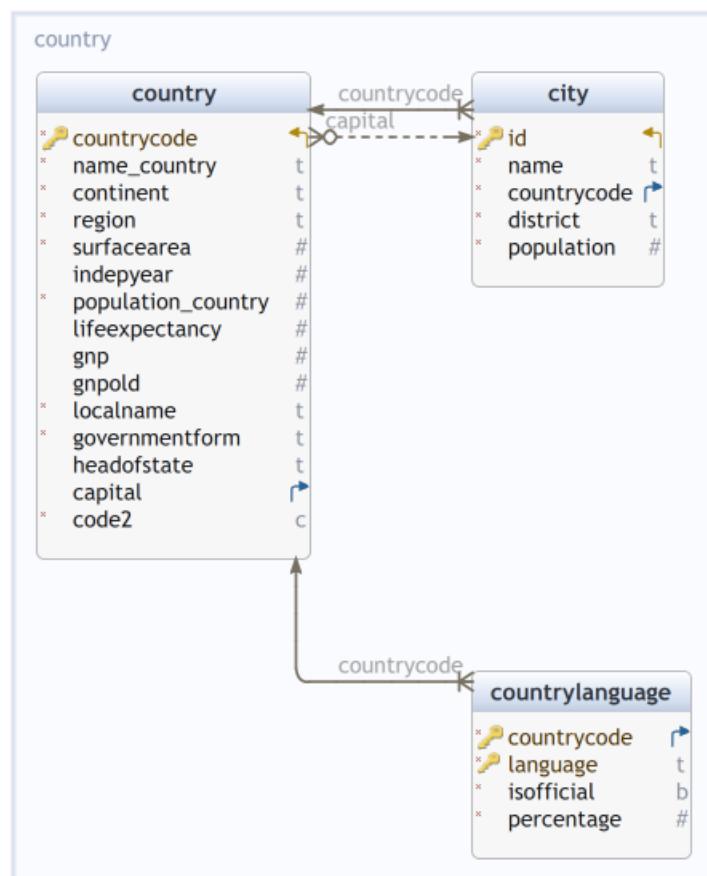


FIG. 1 : Schéma `world`

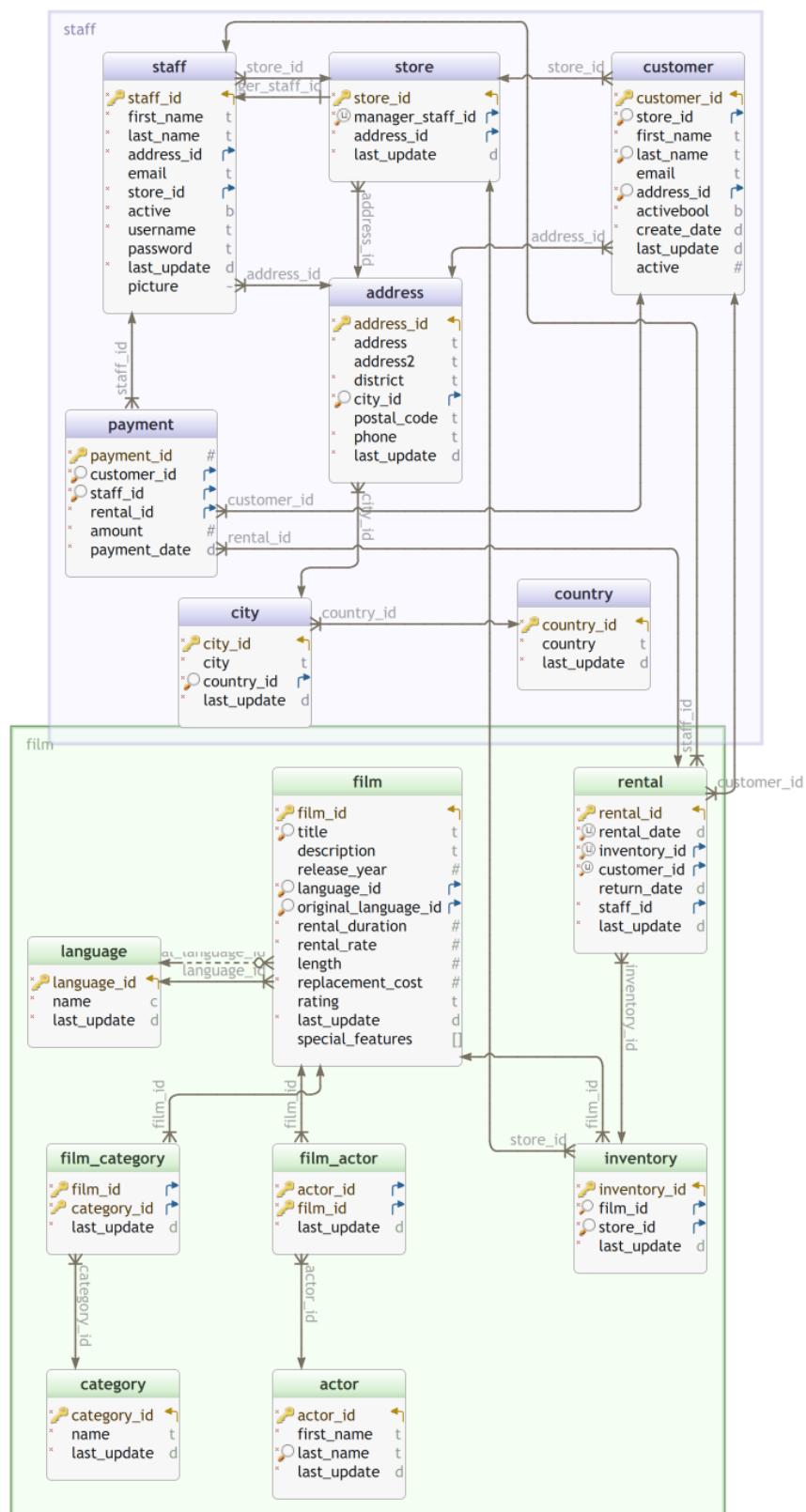


FIG. 2 : Schéma pagila, films

## Schéma pagila

1. Lister la somme des paiements encaissés par année et par magasin.

💡 En PostgreSQL, on obtient le (numéro du) mois à partir d'une valeur de type `timestamp` avec la fonction `EXTRACT()`. On peut extraire les autres éléments de l'estampille de façon semblable, par exemple :

```
SELECT
    EXTRACT(YEAR FROM rental_date) AS annee
FROM
    pagila.rental;
```

### 💡 Solution

```
SELECT
    st.store_id,
    EXTRACT(YEAR FROM pay.payment_date) AS annee,
    SUM(amount) AS payments
FROM
    pagila.payment pay
JOIN
    pagila.staff st USING(staff_id)
GROUP BY
    st.store_id,
    EXTRACT(YEAR FROM pay.payment_date)
; ;
```

2. Lister l'identifiant, le nom, le prénom, de chaque employé ainsi que le total des paiements perçus par cet employé, et sa part dans le revenu de son magasin.

### 💡 Solution

```
SELECT
    st.store_id,
    st.staff_id,
    SUM(pay.amount) AS encaisse
FROM
    pagila.staff st
JOIN
    pagila.payment pay USING(staff_id)
GROUP BY ROLLUP(st.store_id, st.staff_id) ;
```

3. Lister par catégorie de film, les cinq titres qui ont engendré le plus gros chiffre d'affaire/revenu (somme des paiements perçus)

### 💡 Solution

```
WITH film_payment AS (
    SELECT
        film_id,
        fi.title,
        SUM(amount) AS caffaires
    FROM
        pagila.payment pay
    JOIN
        pagila.rental re USING(rental_id)
    JOIN
        pagila.inventory inv USING(inventory_id)
    JOIN
        pagila.film fi USING(film_id)
    GROUP BY
        film_id, fi.title
), rank_per_cat AS (
    SELECT
        category_id,
        ca.name,
        film_id,
        title,
        caffaires,
        RANK() OVER win AS rnk
    FROM
        film_payment fp
    JOIN
        pagila.film_category fc USING(film_id)
    JOIN
        pagila.category ca USING(category_id)
    WINDOW win AS (PARTITION BY category_id ORDER BY caffaires DESC)
)

SELECT
    name,
    title,
    caffaires,
    rnk
FROM rank_per_cat
WHERE rnk <= 5
ORDER BY name, rnk
;
```

### Schéma world

4. Lister pour chaque pays, la proportion de la population qui utilise l'une des deux langues les plus populaires du pays,

### 💡 Solution

```
WITH ranking AS (
    SELECT
        countrycode, name_country, language, percentage,
        RANK() OVER win AS rnk
    FROM
        world.country co
    JOIN
        world.countrylanguage cl USING(countrycode)
    WINDOW
        win AS (PARTITION by countrycode ORDER BY percentage DESC)
)

SELECT
    countrycode, name_country,
    SUM(percentage) AS prop
FROM
    ranking
WHERE
    rnk <= 2
GROUP BY countrycode, name_country
ORDER BY prop DESC;
```

### 💡 Solution

5. Lister pour chaque région (attribut `region` de `country`) les 10 villes les plus peuplées.

### 💡 Solution

```
WITH R AS (
    SELECT
        co.countrycode, co.name_country,
        ci.name,
        RANK() OVER win AS rnk
    FROM
        world.country co
    JOIN
        world.city ci USING(countrycode)
    WINDOW win AS (PARTITION BY co.countrycode ORDER BY ci.population DESC)
)

SELECT
    name_country,
    string_agg(name, ', ')
FROM
    R
WHERE rnk <= 2
GROUP BY countrycode, name_country
;
```

6. Lister pour chaque langue, les deux pays où on trouve le plus grand nombre d'utilisateurs.

### 💡 Solution

```
WITH R AS (
    SELECT
        language,
        name_country,
        percentage*population_country/100.0 AS pop_loc,
        RANK() OVER win AS rnk
    FROM
        world.countrylanguage cl
    NATURAL JOIN
        world.country
    WHERE
        population_country IS NOT NULL
    WINDOW win AS (PARTITION BY language ORDER BY percentage*population_country DESC)
)

SELECT
    language,
    string_agg(name_country, ', ') AS pays, SUM(pop_loc) AS loc
FROM
    R
WHERE rnk <= 2
GROUP BY language ;
```

7. Lister les pays en donnant leur rang par gnp (pnb) par habitant décroissant et leur rang par espérance de vie à la naissance (lifeexpectancy) décroissante.

### 💡 Solution

```
SELECT
    name_country,
    lifeexpectancy ,
    RANK() OVER win_gnp AS rnk_gnppercap,
    RANK() OVER win_life AS rnk_lifeexp
FROM
    world.country
WHERE
    gnp IS NOT NULL AND
    population_country IS NOT NULL AND
    lifeexpectancy IS NOT NULL
WINDOW
    win_gnp AS (ORDER BY gnp/population_country DESC),
    win_life AS (ORDER BY lifeexpectancy DESC)
ORDER BY lifeexpectancy DESC ;
```