

# Project Εργαστηρίου Βάσεων Δεδομένων 2021-2022

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Ημερομηνία: 30/08/2022

Μέλη Ομάδας : 2

Στοιχεία Βάσης:

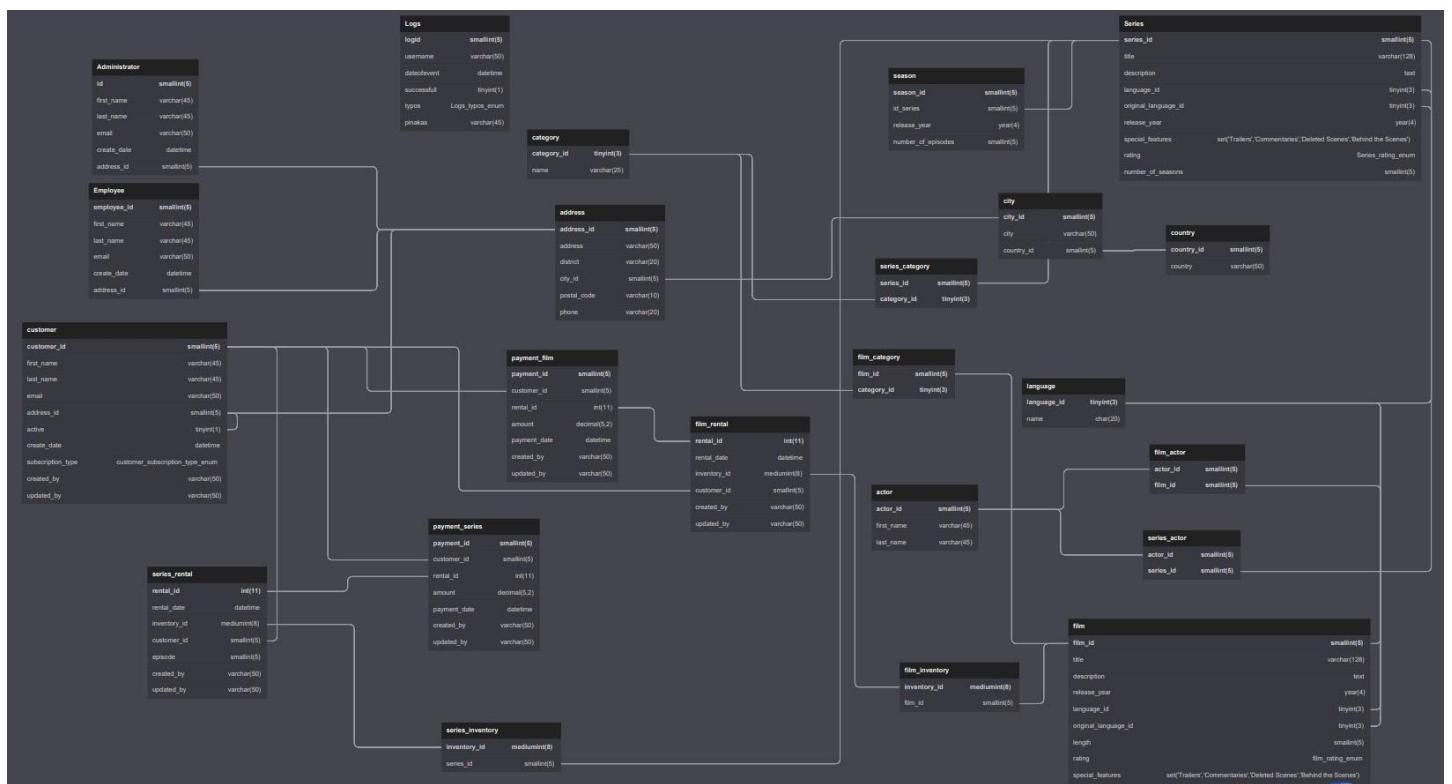
Username:root

password=""

## Μέρος Α: Σχεδιασμός ΒΔ και SQL

1)

### α. Σχεσιακό Διάγραμμα Βάσης



<https://dbdiagram.io/d/6308bd97f1a9b01b0fce8e2>

### β. Περιγραφή Νέας Βάσης

Στην νέα βάση προσθέσαμε τους παρακάτω πίνακες:

#### 1. Administrator

```
CREATE TABLE Administrator (
    id smallint(5) unsigned NOT NULL AUTO_INCREMENT,
    first_name varchar(45) NOT NULL,
    last_name varchar(45) NOT NULL,
    email varchar(50) NOT NULL,
    create_date datetime NOT NULL,
    address_id smallint(5) unsigned NOT NULL,
    PRIMARY KEY (id),
```

```

KEY address_id (address_id),
CONSTRAINT Administrator_ibfk_1 FOREIGN KEY (address_id) REFERENCES address (address_id) ON UPDATE
CASCADE
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

```

## 2. Employee

```

CREATE TABLE Employee (
employee_id smallint(5) unsigned NOT NULL AUTO_INCREMENT,
first_name varchar(45) NOT NULL,
last_name varchar(45) NOT NULL,
email varchar(50) NOT NULL,
create_date datetime NOT NULL,
address_id smallint(5) unsigned NOT NULL,
PRIMARY KEY (employee_id),
KEY address_id (address_id),
CONSTRAINT Employee_ibfk_1 FOREIGN KEY (address_id) REFERENCES address (address_id) ON UPDATE
CASCADE
) ENGINE=InnoDB AUTO_INCREMENT=3 DEFAULT CHARSET=utf8mb4;

```

## 3. Series

```

CREATE TABLE Series (
series_id smallint(5) unsigned NOT NULL AUTO_INCREMENT,
title varchar(128) NOT NULL,
description text DEFAULT NULL,
language_id tinyint(3) unsigned DEFAULT NULL,
original_language_id tinyint(3) unsigned DEFAULT NULL,
release_year year(4) DEFAULT NULL,
special_features set('Trailers','Commentaries','Deleted Scenes','Behind the Scenes') DEFAULT NULL,
rating enum('G','PG','PG-13','R','NC-17') DEFAULT NULL,
number_of_seasons smallint(5) NOT NULL,
PRIMARY KEY (series_id),
KEY language_id (language_id),
KEY original_language_id (original_language_id),
CONSTRAINT Series_ibfk_1 FOREIGN KEY (language_id) REFERENCES language (language_id) ON UPDATE
CASCADE,
CONSTRAINT Series_ibfk_2 FOREIGN KEY (original_language_id) REFERENCES language (language_id) ON
UPDATE CASCADE
) ENGINE=InnoDB AUTO_INCREMENT=122 DEFAULT CHARSET=utf8mb4;

```

## 4. series\_inventory

```

CREATE TABLE series_inventory (
inventory_id mediumint(8) unsigned NOT NULL AUTO_INCREMENT,
series_id smallint(5) unsigned NOT NULL,
PRIMARY KEY (inventory_id),
KEY series_id (series_id),
CONSTRAINT series_inventory_ibfk_1 FOREIGN KEY (series_id) REFERENCES Series (series_id) ON UPDATE
CASCADE
) ENGINE=InnoDB AUTO_INCREMENT=412 DEFAULT CHARSET=utf8mb4;

```

## 5. series\_rental

```

CREATE TABLE series_rental (
rental_id int(11) NOT NULL AUTO_INCREMENT,
rental_date datetime NOT NULL,

```

```

inventory_id mediumint(8) unsigned NOT NULL,
customer_id smallint(5) unsigned NOT NULL,
episode smallint(5) NOT NULL,
created_by varchar(50) DEFAULT NULL,
updated_by varchar(50) DEFAULT NULL,
PRIMARY KEY (rental_id),
KEY customer_id (customer_id),
KEY inventory_id (inventory_id),
CONSTRAINT series_rental_ibfk_1 FOREIGN KEY (customer_id) REFERENCES customer (customer_id) ON
UPDATE CASCADE,
CONSTRAINT series_rental_ibfk_2 FOREIGN KEY (inventory_id) REFERENCES series_inventory (inventory_id) ON
UPDATE CASCADE
) ENGINE=InnoDB AUTO_INCREMENT=301 DEFAULT CHARSET=utf8mb4;

```

## **6. payment\_series**

```

CREATE TABLE payment_series (
payment_id smallint(5) unsigned NOT NULL AUTO_INCREMENT,
customer_id smallint(5) unsigned NOT NULL,
rental_id int(11) DEFAULT NULL,
amount decimal(5,2) NOT NULL,
payment_date datetime NOT NULL,
created_by varchar(50) DEFAULT NULL,
updated_by varchar(50) DEFAULT NULL,
PRIMARY KEY (payment_id),
KEY fk_payment_rental2 (rental_id),
KEY fk_payment_customer2 (customer_id),
CONSTRAINT fk_payment_customer2 FOREIGN KEY (customer_id) REFERENCES customer (customer_id) ON
UPDATE CASCADE,
CONSTRAINT fk_payment_rental2 FOREIGN KEY (rental_id) REFERENCES series_rental (rental_id) ON DELETE SET
NULL ON UPDATE CASCADE
) ENGINE=InnoDB AUTO_INCREMENT=161 DEFAULT CHARSET=utf8mb4;

```

## **7. film\_inventory**

```

CREATE TABLE film_inventory (
inventory_id mediumint(8) unsigned NOT NULL AUTO_INCREMENT,
film_id smallint(5) unsigned NOT NULL,
PRIMARY KEY (inventory_id),
KEY film_id (film_id),
CONSTRAINT film_inventory_ibfk_1 FOREIGN KEY (film_id) REFERENCES film (film_id) ON UPDATE CASCADE
) ENGINE=InnoDB AUTO_INCREMENT=3975 DEFAULT CHARSET=utf8mb4;

```

## **8. film\_rental**

```

CREATE TABLE film_rental (
rental_id int(11) NOT NULL AUTO_INCREMENT,
rental_date datetime NOT NULL,
inventory_id mediumint(8) unsigned NOT NULL,
customer_id smallint(5) unsigned NOT NULL,
created_by varchar(50) DEFAULT NULL,
updated_by varchar(50) DEFAULT NULL,
PRIMARY KEY (rental_id),
KEY customer_id (customer_id),
KEY inventory_id (inventory_id),
CONSTRAINT film_rental_ibfk_1 FOREIGN KEY (customer_id) REFERENCES customer (customer_id) ON UPDATE
CASCADE,
CONSTRAINT film_rental_ibfk_2 FOREIGN KEY (inventory_id) REFERENCES film_inventory (inventory_id) ON
UPDATE CASCADE
) ENGINE=InnoDB AUTO_INCREMENT=11061 DEFAULT CHARSET=utf8mb4;

```

## **9. payment\_film**

```
CREATE TABLE payment_film (
    payment_id smallint(5) unsigned NOT NULL AUTO_INCREMENT,
    customer_id smallint(5) unsigned NOT NULL,
    rental_id int(11) DEFAULT NULL,
    amount decimal(5,2) NOT NULL,
    payment_date datetime NOT NULL,
    created_by varchar(50) DEFAULT NULL,
    updated_by varchar(50) DEFAULT NULL,
    PRIMARY KEY (payment_id),
    KEY fk_payment_rental (rental_id),
    KEY fk_payment_customer (customer_id),
    CONSTRAINT fk_payment_customer FOREIGN KEY (customer_id) REFERENCES customer (customer_id) ON
    UPDATE CASCADE,
    CONSTRAINT fk_payment_rental FOREIGN KEY (rental_id) REFERENCES film_rental (rental_id) ON DELETE SET
    NULL ON UPDATE CASCADE
) ENGINE=InnoDB AUTO_INCREMENT=66 DEFAULT CHARSET=utf8mb4;
```

## **10. Logs**

```
CREATE TABLE Logs (
    logid smallint(5) NOT NULL AUTO_INCREMENT,
    username varchar(50) NOT NULL,
    dateofevent datetime NOT NULL,
    successfull tinyint(1) NOT NULL,
    typos enum('Eisagogi','Enimerosi','Diagrafi') DEFAULT NULL,
    pinakas varchar(45) NOT NULL,
    PRIMARY KEY (logid)
) ENGINE=InnoDB AUTO_INCREMENT=71 DEFAULT CHARSET=utf8mb4;
```

## **11. season**

```
CREATE TABLE season (
    season_id smallint(5) unsigned NOT NULL AUTO_INCREMENT,
    id_series smallint(5) unsigned NOT NULL,
    release_year year(4) DEFAULT NULL,
    number_of_episodes smallint(5) NOT NULL,
    PRIMARY KEY (season_id),
    KEY id_series (id_series),
    CONSTRAINT season_ibfk_1 FOREIGN KEY (id_series) REFERENCES Series (series_id) ON UPDATE CASCADE
) ENGINE=InnoDB AUTO_INCREMENT=36 DEFAULT CHARSET=utf8mb4;
```

## **12. film\_category**

```
CREATE TABLE film_category (
    film_id smallint(5) unsigned NOT NULL,
    category_id tinyint(3) unsigned NOT NULL,
    PRIMARY KEY (film_id,category_id),
    KEY fk_film_category_category (category_id),
    CONSTRAINT fk_film_category_category FOREIGN KEY (category_id) REFERENCES category (category_id) ON
    UPDATE CASCADE,
    CONSTRAINT fk_film_category_film FOREIGN KEY (film_id) REFERENCES film (film_id) ON UPDATE CASCADE
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;
```

## **13. series\_category**

```
CREATE TABLE series_category (
    series_id smallint(5) unsigned NOT NULL,
```

```

category_id tinyint(3) unsigned NOT NULL,
PRIMARY KEY (series_id,category_id),
KEY category_id (category_id),
CONSTRAINT series_category_ibfk_1 FOREIGN KEY (series_id) REFERENCES Series (series_id) ON UPDATE CASCADE,
CONSTRAINT series_category_ibfk_2 FOREIGN KEY (category_id) REFERENCES category (category_id) ON UPDATE CASCADE
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

```

## 14. film\_actor

```

CREATE TABLE film_actor (
actor_id smallint(5) unsigned NOT NULL,
film_id smallint(5) unsigned NOT NULL,
PRIMARY KEY (actor_id,film_id),
KEY fk_film_actor_film (film_id),
CONSTRAINT fk_film_actor_actor FOREIGN KEY (actor_id) REFERENCES actor (actor_id) ON UPDATE CASCADE,
CONSTRAINT fk_film_actor_film FOREIGN KEY (film_id) REFERENCES film (film_id) ON UPDATE CASCADE
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

```

## 15. series\_actor

```

CREATE TABLE series_actor (
actor_id smallint(5) unsigned NOT NULL,
series_id smallint(5) unsigned NOT NULL,
PRIMARY KEY (actor_id,series_id),
KEY series_id (series_id),
CONSTRAINT series_actor_ibfk_1 FOREIGN KEY (actor_id) REFERENCES actor (actor_id) ON UPDATE CASCADE,
CONSTRAINT series_actor_ibfk_2 FOREIGN KEY (series_id) REFERENCES Series (series_id) ON UPDATE CASCADE
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

```

Επίσης προσθέσαμε κάποια επιπλέον πεδία σε πίνακες που υπήρχαν ήδη.

customer

```

CREATE TABLE customer (
customer_id smallint(5) unsigned NOT NULL AUTO_INCREMENT,
first_name varchar(45) NOT NULL,
last_name varchar(45) NOT NULL,
email varchar(50) DEFAULT NULL,
address_id smallint(5) unsigned NOT NULL,
active tinyint(1) NOT NULL DEFAULT 1,
create_date datetime NOT NULL,
subscription_type enum('Film','Series','Both') DEFAULT NULL, (προσδιορίζει τον τύπο εγγραφής(τανίες, οειρές ή και τα δύο)
created_by varchar(50) DEFAULT NULL,
updated_by varchar(50) DEFAULT NULL,
PRIMARY KEY (customer_id),
KEY fk_customer_address (address_id),
CONSTRAINT fk_customer_address FOREIGN KEY (address_id) REFERENCES address (address_id) ON UPDATE CASCADE
) ENGINE=InnoDB AUTO_INCREMENT=6971 DEFAULT CHARSET=utf8mb4;

```

Τα πεδία `created\_by` και `updated\_by` υπάρχουν και σε άλλους πίνακες όπως film\_rental, series\_rental, payment\_series, payment\_film και χρησιμεύουν στο να προσδιορίζεται ποιος κάνει κάποιες αλλαγές, ουσιαστικά είναι emails είτε ενός customer, employee ή Administrator. Με την βοήθεια των triggers φαίνεται ποιος έχει δικαίωμα να κάνει αλλαγές και αν δεν επιτρέπεται η αλλαγή τότε εμφανίζεται error(όπως για παράδειγμα ένας πελάτης να επεξεργαστεί/δημιουργήσει πληρωμή ή ενοικίαση ταινίας ή επεισοδίου σειράς για κάποιον άλλο πελάτη).

Λόγω των πολλών insert και delete που κάναμε κατά τη διάρκεια των δοκιμών της βάσης μας δεν τα επισυνάπτουμε στην αναφορά αλλά υπάρχουν όλα στο αρχείο .sql δηλαδή την εξαγώμενη βάση που υπάρχει στο .zip αρχείο που θα στείλουμε.

### 3) Stored Procedures(Πάντού ως delimiter χρησιμοποιείται το σύμβολο \$)

1.

```
CREATE PROCEDURE N_th_most_rentals(IN option CHAR(1),IN orio INT(5),IN first DATE,IN second DATE)
BEGIN
IF option='m' THEN
SELECT film_id,count(film_id) as TOTAL FROM film_rental INNER JOIN film_inventory ON
film_rental.inventory_id=film_inventory.inventory_id
WHERE DATE(rental_date) BETWEEN first AND second
GROUP BY film_id ORDER BY TOTAL DESC LIMIT orio;
ELSEIF option='s' THEN
SELECT series_id,count(series_id) as TOTAL FROM series_rental INNER JOIN series_inventory ON
series_rental.inventory_id=series_inventory.inventory_id
WHERE DATE(rental_date) BETWEEN first AND second
GROUP BY series_id ORDER BY TOTAL DESC LIMIT orio;
END IF;
END$
```

#### Παράδειγμα:

α) 4 πρώτες ταινίες με τις περισσότερες ενοικιάσεις τον αύγουστο του 2022:

rental_id	rental_date	inventory_id	customer_id	created_by	updated_by
11015	2010-01-01 10:01:00	3456	3	NULL	NULL
11016	2010-02-01 10:01:00	1	3	NULL	NULL
11017	2010-03-01 10:01:00	3774	3	NULL	NULL
11018	2010-01-01 10:01:00	1	596	NULL	NULL
11019	2010-02-01 10:01:00	3774	596	NULL	NULL
11020	2010-03-01 10:01:00	187	596	NULL	NULL
11024	2010-01-01 23:50:00	1299	3	NULL	NULL
11025	2010-02-01 12:00:01	1	596	NULL	NULL
11026	2010-02-01 12:00:01	3774	596	NULL	NULL
11040	2010-02-01 00:00:00	1	596	NULL	NULL
11041	2010-02-01 00:00:00	1	596	NULL	NULL
11042	2010-02-01 00:00:00	1	596	NULL	NULL
11043	2010-02-01 00:00:00	1	596	NULL	NULL
11044	2010-02-01 00:00:00	1	596	NULL	NULL
11045	2010-02-01 00:00:00	1	596	NULL	NULL
11046	2010-02-01 00:00:00	1	596	NULL	NULL
11047	2010-02-01 00:00:00	1	596	NULL	NULL
11048	2010-02-01 00:00:00	1	596	NULL	NULL
11049	2022-08-24 16:48:20	1	3	NULL	NULL
11050	2022-08-24 19:25:50	1	3	Ioannischatzigeorgiou@gmail.com	NULL
11051	2022-08-24 19:27:18	1	3	LINDA.WILLIAMS@sakilacustomer.org	NULL
11053	2022-08-24 19:36:18	1	3	LINDA.WILLIAMS@sakilacustomer.org	NULL
11054	2022-08-24 19:38:05	1	3	LINDA.WILLIAMS@sakilacustomer.org	NULL
11055	2022-08-24 19:40:04	1	3	Ioannischatzigeorgiou@gmail.com	NULL
11056	2022-08-24 20:45:33	1	3	LINDA.WILLIAMS@sakilacustomer.org	NULL
11057	2022-08-24 20:48:24	1	3	LINDA.WILLIAMS@sakilacustomer.org	NULL
11058	2022-08-24 20:48:57	1	3	LINDA.WILLIAMS@sakilacustomer.org	NULL
11059	2022-08-24 21:04:35	3774	596	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL
11060	2022-08-24 21:04:37	3774	596	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL
11061	2022-08-28 00:00:00	3773	3	LINDA.WILLIAMS@sakilacustomer.org	NULL
11062	2022-08-28 00:00:00	3774	3	LINDA.WILLIAMS@sakilacustomer.org	NULL
11063	2022-08-28 00:00:00	1	3	LINDA.WILLIAMS@sakilacustomer.org	NULL
11064	2022-08-28 00:00:00	1	3	LINDA.WILLIAMS@sakilacustomer.org	NULL
11065	2022-08-28 00:00:00	1	3	LINDA.WILLIAMS@sakilacustomer.org	NULL
11066	2022-08-28 00:00:00	3774	3	LINDA.WILLIAMS@sakilacustomer.org	NULL
11067	2022-08-28 00:00:00	3774	3	LINDA.WILLIAMS@sakilacustomer.org	NULL
11068	2022-08-28 00:00:00	1	596	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL
11069	2022-08-28 00:00:00	3774	596	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL

38 rows in set (0,00 sec)

```
mysql> call N_th_most_rentals('m',4,'2022-08-01','2022-08-31');
+-----+-----+
| film_id | TOTAL |
+-----+-----+
|      1 |    13 |
|     826 |     7 |
+-----+-----+
2 rows in set (0,00 sec)

Query OK, 0 rows affected (0,00 sec)

mysql>
```

b) 3 πρώτες σειρές με τις περισσότερες ενοικιάσεις τον αύγουστο του 2022:

rental_id	rental_date	inventory_id	customer_id	episode	created_by	updated_by
215	2010-01-01 10:01:00	400	251	10	NULL	NULL
216	2010-02-01 10:01:00	401	251	119	NULL	NULL
217	2010-03-01 10:01:00	402	251	249	NULL	NULL
221	2010-01-01 10:01:00	400	596	10	NULL	NULL
222	2010-02-01 10:01:00	401	596	119	NULL	NULL
223	2010-03-01 10:01:00	402	596	249	NULL	NULL
230	2010-01-01 12:00:01	400	251	7	NULL	NULL
231	2010-01-01 12:00:01	400	251	9	NULL	NULL
232	2010-01-01 12:00:01	401	251	9	NULL	NULL
233	2010-01-01 12:00:01	401	251	119	NULL	NULL
234	2010-02-01 12:00:01	401	596	119	NULL	NULL
235	2010-02-01 12:00:01	401	596	118	NULL	NULL
236	2010-02-01 12:00:01	401	596	117	NULL	NULL
237	2010-02-01 12:00:01	400	596	1	NULL	NULL
238	2010-02-01 12:00:01	402	596	1	NULL	NULL
239	2010-01-01 00:00:00	400	251	49	NULL	NULL
240	2010-01-01 00:00:00	400	251	49	NULL	NULL
241	2010-01-01 00:00:00	400	251	49	NULL	NULL
242	2010-01-01 00:00:00	400	251	49	NULL	NULL
243	2010-01-01 00:00:00	400	251	49	NULL	NULL
244	2010-01-01 00:00:00	400	251	49	NULL	NULL
245	2010-01-01 00:00:00	400	251	49	NULL	NULL
246	2010-02-01 00:00:00	400	596	49	NULL	NULL
247	2010-02-01 00:00:00	400	596	49	NULL	NULL
248	2010-02-01 00:00:00	400	596	49	NULL	NULL
249	2022-08-24 16:51:08	400	251	10	NULL	NULL
250	2022-08-24 16:52:34	400	251	10	NULL	NULL
251	2022-08-24 20:01:42	400	251	49	VICKIE.BREWER@sakilacustomer.org	NULL
252	2022-08-24 20:02:32	400	251	48	VICKIE.BREWER@sakilacustomer.org	NULL
253	2022-08-24 20:02:39	400	251	47	VICKIE.BREWER@sakilacustomer.org	NULL
254	2022-08-24 20:02:47	400	251	46	VICKIE.BREWER@sakilacustomer.org	NULL
255	2022-08-24 20:03:20	400	251	46	Ioannischatzigeorgiou@gmail.com	NULL
256	2022-08-24 20:03:25	400	251	46	Ioannischatzigeorgiou@gmail.com	NULL
257	2022-08-24 20:03:29	400	251	46	Ioannischatzigeorgiou@gmail.com	NULL
259	2022-08-24 20:15:33	400	251	49	VICKIE.BREWER@sakilacustomer.org	NULL
260	2022-08-24 20:16:23	400	251	49	VICKIE.BREWER@sakilacustomer.org	NULL
261	2022-08-24 20:16:28	400	251	49	VICKIE.BREWER@sakilacustomer.org	NULL
262	2022-08-24 20:17:18	400	251	49	Ioannischatzigeorgiou@gmail.com	NULL
263	2022-08-24 20:17:34	400	251	49	Ioannischatzigeorgiou@gmail.com	NULL

264	2022-08-24 20:17:37	400	251	49	Ioannischatzigeorgiou@gmail.com	NULL
265	2022-08-24 20:17:39	400	251	49	Ioannischatzigeorgiou@gmail.com	NULL
266	2022-08-24 20:55:46	400	251	49	VICKIE.BREWER@sakilacustomer.org	NULL
274	2022-08-24 21:00:21	400	596	10	Ioannischatzigeorgiou@gmail.com	NULL
275	2022-08-24 21:00:23	400	596	10	Ioannischatzigeorgiou@gmail.com	NULL
276	2022-08-24 21:00:25	400	596	10	Ioannischatzigeorgiou@gmail.com	NULL
277	2022-08-24 21:00:26	400	596	10	Ioannischatzigeorgiou@gmail.com	NULL
278	2022-08-24 21:00:26	400	596	10	Ioannischatzigeorgiou@gmail.com	NULL
279	2022-08-24 21:00:36	400	596	11	Ioannischatzigeorgiou@gmail.com	NULL
280	2022-08-24 21:00:52	401	596	119	Ioannischatzigeorgiou@gmail.com	NULL
283	2022-08-24 21:03:27	400	596	11	Ioannischatzigeorgiou@gmail.com	NULL
284	2022-08-24 21:03:56	400	596	11	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL
285	2022-08-24 21:03:59	400	596	11	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL
286	2022-08-24 21:04:04	400	596	12	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL
287	2022-08-24 21:04:43	400	596	13	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL
290	2022-08-24 21:11:24	402	251	13	VICKIE.BREWER@sakilacustomer.org	NULL
291	2022-08-24 21:11:33	402	251	13	VICKIE.BREWER@sakilacustomer.org	NULL
292	2022-08-24 21:11:35	402	251	13	VICKIE.BREWER@sakilacustomer.org	NULL
293	2022-08-24 21:12:35	402	251	13	VICKIE.BREWER@sakilacustomer.org	NULL
294	2022-08-24 21:13:23	402	251	13	Ioannischatzigeorgiou@gmail.com	NULL
295	2022-08-24 21:13:42	402	251	13	Ioannischatzigeorgiou@gmail.com	NULL
296	2022-08-24 21:13:44	402	251	13	Ioannischatzigeorgiou@gmail.com	NULL
297	2022-08-24 21:13:45	402	251	13	Ioannischatzigeorgiou@gmail.com	NULL
298	2022-08-25 00:43:45	402	251	13	Ioannischatzigeorgiou@gmail.com	NULL
299	2022-08-25 00:44:08	402	251	13	VICKIE.BREWER@sakilacustomer.org	NULL
300	2022-08-25 15:32:58	400	596	10	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL
301	2022-08-28 00:00:00	400	251	25	VICKIE.BREWER@sakilacustomer.org	NULL
302	2022-08-28 00:00:00	400	251	26	VICKIE.BREWER@sakilacustomer.org	NULL
303	2022-08-28 00:00:00	400	251	27	VICKIE.BREWER@sakilacustomer.org	NULL
304	2022-08-28 00:00:00	401	596	100	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL
305	2022-08-28 00:00:00	400	35	1	VIRGINIA.GREEN@sakilacustomer.org	NULL

70 rows in set (0.01 sec)

```

mysql> call N_th_most_rentals('s',3,'2022-08-01','2022-08-31');
+-----+-----+
| series_id | TOTAL |
+-----+-----+
|       110 |    33 |
|       112 |    10 |
|       111 |     2 |
+-----+-----+
3 rows in set (0.00 sec)

Query OK, 0 rows affected (0.00 sec)

mysql>

```

2.

```

CREATE PROCEDURE Number_of_rentals(IN mail VARCHAR(50),IN imerominia DATE)
BEGIN
DECLARE id SMALLINT(5);
DECLARE sub_type ENUM('Film','Series','Both');
DECLARE sum1 INT;
DECLARE sum2 INT;
SELECT customer_id INTO id from customer where email=mail;
SELECT subscription_type INTO sub_type from customer where email=mail;
IF sub_type='Film' THEN
  SELECT COUNT(*) FROM film_rental WHERE DATE(rental_date)=imerominia AND customer_id=id;
ELSEIF sub_type='Series' THEN
  SELECT COUNT(*) FROM series_rental WHERE DATE(rental_date)=imerominia AND customer_id=id;
ELSE
  SELECT COUNT(*) INTO sum1 FROM film_rental WHERE DATE(rental_date)=imerominia AND customer_id=id;
  SELECT COUNT(*) INTO sum2 FROM series_rental WHERE DATE(rental_date)=imerominia AND customer_id=id;
  SELECT sum1 as count_of_film_rentals;
  SELECT sum2 as count_of_series_rentals;
  SELECT sum1+sum2 as all_rentals;
END IF;
END$
```

### **Παράδειγμα:**

α) Παράδειγμα για πελάτη που νοικιάζει μόνο ταινίες:

```

mysql> select * from film_rental;
+-----+-----+-----+-----+-----+-----+
| rental_id | rental_date | inventory_id | customer_id | created_by | updated_by |
+-----+-----+-----+-----+-----+-----+
| 11015 | 2010-01-01 10:01:00 | 3456 | 3 | NULL | NULL |
| 11016 | 2010-02-01 10:01:00 | 1 | 3 | NULL | NULL |
| 11017 | 2010-03-01 10:01:00 | 3774 | 3 | NULL | NULL |
| 11018 | 2010-01-01 10:01:00 | 1 | 596 | NULL | NULL |
| 11019 | 2010-02-01 10:01:00 | 3774 | 596 | NULL | NULL |
| 11020 | 2010-03-01 10:01:00 | 187 | 596 | NULL | NULL |
| 11024 | 2010-01-01 23:50:00 | 1299 | 3 | NULL | NULL |
| 11025 | 2010-02-01 12:00:01 | 1 | 596 | NULL | NULL |
| 11026 | 2010-02-01 12:00:01 | 3774 | 596 | NULL | NULL |
| 11040 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11041 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11042 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11043 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11044 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11045 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11046 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11047 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11048 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11049 | 2022-08-24 16:48:20 | 1 | 3 | NULL | NULL |
| 11050 | 2022-08-24 19:25:50 | 1 | 3 | Ioannischatzigeorgiou@gmail.com | NULL |
| 11051 | 2022-08-24 19:27:18 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11053 | 2022-08-24 19:36:18 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11054 | 2022-08-24 19:38:05 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11055 | 2022-08-24 19:40:04 | 1 | 3 | Ioannischatzigeorgiou@gmail.com | NULL |
| 11056 | 2022-08-24 20:45:33 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11057 | 2022-08-24 20:48:24 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11058 | 2022-08-24 20:48:57 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11059 | 2022-08-24 21:04:35 | 3774 | 596 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
| 11060 | 2022-08-24 21:04:37 | 3774 | 596 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
| 11061 | 2022-08-28 00:00:00 | 3773 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11062 | 2022-08-28 00:00:00 | 3774 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11063 | 2022-08-28 00:00:00 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11064 | 2022-08-28 00:00:00 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11065 | 2022-08-28 00:00:00 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11066 | 2022-08-28 00:00:00 | 3774 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11067 | 2022-08-28 00:00:00 | 3774 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11068 | 2022-08-28 00:00:00 | 1 | 596 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
| 11069 | 2022-08-28 00:00:00 | 3774 | 596 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
+-----+-----+-----+-----+-----+-----+
38 rows in set (0,00 sec)

```

```

mysql> call Number_of_rentals('LINDA.WILLIAMS@sakilacustomer.org', '2022-08-24');
+-----+
| COUNT(*) |
+-----+
|      9 |
+-----+
1 row in set (0,00 sec)

```

β) Παράδειγμα για πελάτη που νοικιάζει μόνο σειρές:

rental_id	rental_date	inventory_id	customer_id	episode	created_by	updated_by
215	2010-01-01 10:01:00	400	251	10	NULL	NULL
216	2010-02-01 10:01:00	401	251	119	NULL	NULL
217	2010-03-01 10:01:00	402	251	249	NULL	NULL
221	2010-01-01 10:01:00	400	596	10	NULL	NULL
222	2010-02-01 10:01:00	401	596	119	NULL	NULL
223	2010-03-01 10:01:00	402	596	249	NULL	NULL
230	2010-01-01 12:00:01	400	251	7	NULL	NULL
231	2010-01-01 12:00:01	400	251	9	NULL	NULL
232	2010-01-01 12:00:01	401	251	9	NULL	NULL
233	2010-01-01 12:00:01	401	251	119	NULL	NULL
234	2010-02-01 12:00:01	401	596	119	NULL	NULL
235	2010-02-01 12:00:01	401	596	118	NULL	NULL
236	2010-02-01 12:00:01	401	596	117	NULL	NULL
237	2010-02-01 12:00:01	400	596	1	NULL	NULL
238	2010-02-01 12:00:01	402	596	1	NULL	NULL
239	2010-01-01 00:00:00	400	251	49	NULL	NULL
240	2010-01-01 00:00:00	400	251	49	NULL	NULL
241	2010-01-01 00:00:00	400	251	49	NULL	NULL
242	2010-01-01 00:00:00	400	251	49	NULL	NULL
243	2010-01-01 00:00:00	400	251	49	NULL	NULL
244	2010-01-01 00:00:00	400	251	49	NULL	NULL
245	2010-01-01 00:00:00	400	251	49	NULL	NULL
246	2010-02-01 00:00:00	400	596	49	NULL	NULL
247	2010-02-01 00:00:00	400	596	49	NULL	NULL
248	2010-02-01 00:00:00	400	596	49	NULL	NULL
249	2022-08-24 16:51:08	400	251	10	NULL	NULL
250	2022-08-24 16:52:34	400	251	10	NULL	NULL
251	2022-08-24 20:01:42	400	251	49	VICKIE.BREWER@sakilacustomer.org	NULL
252	2022-08-24 20:02:32	400	251	48	VICKIE.BREWER@sakilacustomer.org	NULL
253	2022-08-24 20:02:39	400	251	47	VICKIE.BREWER@sakilacustomer.org	NULL
254	2022-08-24 20:02:47	400	251	46	VICKIE.BREWER@sakilacustomer.org	NULL
255	2022-08-24 20:03:20	400	251	46	Ioannischatzigeorgiou@gmail.com	NULL
256	2022-08-24 20:03:25	400	251	46	Ioannischatzigeorgiou@gmail.com	NULL
257	2022-08-24 20:03:29	400	251	46	Ioannischatzigeorgiou@gmail.com	NULL
259	2022-08-24 20:15:33	400	251	49	VICKIE.BREWER@sakilacustomer.org	NULL
260	2022-08-24 20:16:23	400	251	49	VICKIE.BREWER@sakilacustomer.org	NULL
261	2022-08-24 20:16:28	400	251	49	VICKIE.BREWER@sakilacustomer.org	NULL
262	2022-08-24 20:17:18	400	251	49	Ioannischatzigeorgiou@gmail.com	NULL
263	2022-08-24 20:17:34	400	251	49	Ioannischatzigeorgiou@gmail.com	NULL

```

264 | 2022-08-24 20:17:34 | 400 | 251 | 49 | Ioannischatzigeorgiou@gmail.com | NULL
265 | 2022-08-24 20:17:37 | 400 | 251 | 49 | Ioannischatzigeorgiou@gmail.com | NULL
266 | 2022-08-24 20:17:39 | 400 | 251 | 49 | Ioannischatzigeorgiou@gmail.com | NULL
267 | 2022-08-24 20:55:46 | 400 | 251 | 49 | VICKIE.BREWER@sakilacustomer.org | NULL
274 | 2022-08-24 21:00:21 | 400 | 596 | 10 | Ioannischatzigeorgiou@gmail.com | NULL
275 | 2022-08-24 21:00:23 | 400 | 596 | 10 | Ioannischatzigeorgiou@gmail.com | NULL
276 | 2022-08-24 21:00:25 | 400 | 596 | 10 | Ioannischatzigeorgiou@gmail.com | NULL
277 | 2022-08-24 21:00:26 | 400 | 596 | 10 | Ioannischatzigeorgiou@gmail.com | NULL
278 | 2022-08-24 21:00:26 | 400 | 596 | 10 | Ioannischatzigeorgiou@gmail.com | NULL
279 | 2022-08-24 21:00:36 | 400 | 596 | 11 | Ioannischatzigeorgiou@gmail.com | NULL
280 | 2022-08-24 21:00:52 | 401 | 596 | 119 | Ioannischatzigeorgiou@gmail.com | NULL
283 | 2022-08-24 21:03:27 | 400 | 596 | 11 | Ioannischatzigeorgiou@gmail.com | NULL
284 | 2022-08-24 21:03:56 | 400 | 596 | 11 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL
285 | 2022-08-24 21:03:59 | 400 | 596 | 11 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL
286 | 2022-08-24 21:04:04 | 400 | 596 | 12 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL
287 | 2022-08-24 21:04:43 | 400 | 596 | 13 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL
290 | 2022-08-24 21:11:24 | 402 | 251 | 13 | VICKIE.BREWER@sakilacustomer.org | NULL
291 | 2022-08-24 21:11:33 | 402 | 251 | 13 | VICKIE.BREWER@sakilacustomer.org | NULL
292 | 2022-08-24 21:11:35 | 402 | 251 | 13 | VICKIE.BREWER@sakilacustomer.org | NULL
293 | 2022-08-24 21:12:35 | 402 | 251 | 13 | VICKIE.BREWER@sakilacustomer.org | NULL
294 | 2022-08-24 21:13:23 | 402 | 251 | 13 | Ioannischatzigeorgiou@gmail.com | NULL
295 | 2022-08-24 21:13:42 | 402 | 251 | 13 | Ioannischatzigeorgiou@gmail.com | NULL
296 | 2022-08-24 21:13:44 | 402 | 251 | 13 | Ioannischatzigeorgiou@gmail.com | NULL
297 | 2022-08-24 21:13:45 | 402 | 251 | 13 | Ioannischatzigeorgiou@gmail.com | NULL
298 | 2022-08-25 00:43:45 | 402 | 251 | 13 | Ioannischatzigeorgiou@gmail.com | NULL
299 | 2022-08-25 00:44:08 | 402 | 251 | 13 | VICKIE.BREWER@sakilacustomer.org | NULL
300 | 2022-08-25 15:32:58 | 400 | 596 | 10 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL
301 | 2022-08-28 00:00:00 | 400 | 251 | 25 | VICKIE.BREWER@sakilacustomer.org | NULL
302 | 2022-08-28 00:00:00 | 400 | 251 | 26 | VICKIE.BREWER@sakilacustomer.org | NULL
303 | 2022-08-28 00:00:00 | 400 | 251 | 27 | VICKIE.BREWER@sakilacustomer.org | NULL
304 | 2022-08-28 00:00:00 | 401 | 596 | 100 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL
305 | 2022-08-28 00:00:00 | 400 | 35 | 1 | VIRGINIA.GREEN@sakilacustomer.org | NULL

```

70 rows in set (0,01 sec)

```

mysql> call Number_of_rentals('VICKIE.BREWER@sakilacustomer.org','2022-08-24');
+-----+
| COUNT(*) |
+-----+
|      25 |
+-----+
1 row in set (0,00 sec)

Query OK, 2 rows affected (0,00 sec)

mysql>

```

γ) Παράδειγμα από πελάτη που ενοικιάζει και τα δύο(και ταινίες και σειρές):

```
mysql> select * from film_rental;
+-----+-----+-----+-----+-----+-----+
| rental_id | rental_date | inventory_id | customer_id | created_by | updated_by |
+-----+-----+-----+-----+-----+-----+
| 11015 | 2010-01-01 10:01:00 | 3456 | 3 | NULL | NULL |
| 11016 | 2010-02-01 10:01:00 | 1 | 3 | NULL | NULL |
| 11017 | 2010-03-01 10:01:00 | 3774 | 3 | NULL | NULL |
| 11018 | 2010-01-01 10:01:00 | 1 | 596 | NULL | NULL |
| 11019 | 2010-02-01 10:01:00 | 3774 | 596 | NULL | NULL |
| 11020 | 2010-03-01 10:01:00 | 187 | 596 | NULL | NULL |
| 11024 | 2010-01-01 23:50:00 | 1299 | 3 | NULL | NULL |
| 11025 | 2010-02-01 12:00:01 | 1 | 596 | NULL | NULL |
| 11026 | 2010-02-01 12:00:01 | 3774 | 596 | NULL | NULL |
| 11040 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11041 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11042 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11043 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11044 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11045 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11046 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11047 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11048 | 2010-02-01 00:00:00 | 1 | 596 | NULL | NULL |
| 11049 | 2022-08-24 16:48:20 | 1 | 3 | NULL | NULL |
| 11050 | 2022-08-24 19:25:50 | 1 | 3 | Ioannischatzigeorgiou@gmail.com | NULL |
| 11051 | 2022-08-24 19:27:18 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11053 | 2022-08-24 19:36:18 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11054 | 2022-08-24 19:38:05 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11055 | 2022-08-24 19:40:04 | 1 | 3 | Ioannischatzigeorgiou@gmail.com | NULL |
| 11056 | 2022-08-24 20:45:33 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11057 | 2022-08-24 20:48:24 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11058 | 2022-08-24 20:48:57 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11059 | 2022-08-24 21:04:35 | 3774 | 596 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
| 11060 | 2022-08-24 21:04:37 | 3774 | 596 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
| 11061 | 2022-08-28 00:00:00 | 3773 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11062 | 2022-08-28 00:00:00 | 3774 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11063 | 2022-08-28 00:00:00 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11064 | 2022-08-28 00:00:00 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11065 | 2022-08-28 00:00:00 | 1 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11066 | 2022-08-28 00:00:00 | 3774 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11067 | 2022-08-28 00:00:00 | 3774 | 3 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 11068 | 2022-08-28 00:00:00 | 1 | 596 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
| 11069 | 2022-08-28 00:00:00 | 3774 | 596 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
+-----+-----+-----+-----+-----+-----+
38 rows in set (0,00 sec)
```

```
mysql> select * from series_rental;
+-----+-----+-----+-----+-----+-----+
| rental_id | rental_date | inventory_id | customer_id | episode | created_by | updated_by |
+-----+-----+-----+-----+-----+-----+
| 215 | 2010-01-01 10:01:00 | 400 | 251 | 10 | NULL | NULL |
| 216 | 2010-02-01 10:01:00 | 401 | 251 | 119 | NULL | NULL |
| 217 | 2010-03-01 10:01:00 | 402 | 251 | 249 | NULL | NULL |
| 221 | 2010-01-01 10:01:00 | 400 | 596 | 10 | NULL | NULL |
| 222 | 2010-02-01 10:01:00 | 401 | 596 | 119 | NULL | NULL |
| 223 | 2010-03-01 10:01:00 | 402 | 596 | 249 | NULL | NULL |
| 230 | 2010-01-01 12:00:01 | 400 | 251 | 7 | NULL | NULL |
| 231 | 2010-01-01 12:00:01 | 400 | 251 | 9 | NULL | NULL |
| 232 | 2010-01-01 12:00:01 | 401 | 251 | 9 | NULL | NULL |
| 233 | 2010-01-01 12:00:01 | 401 | 251 | 119 | NULL | NULL |
| 234 | 2010-02-01 12:00:01 | 401 | 596 | 119 | NULL | NULL |
| 235 | 2010-02-01 12:00:01 | 401 | 596 | 118 | NULL | NULL |
| 236 | 2010-02-01 12:00:01 | 401 | 596 | 117 | NULL | NULL |
| 237 | 2010-02-01 12:00:01 | 400 | 596 | 1 | NULL | NULL |
| 238 | 2010-02-01 12:00:01 | 402 | 596 | 1 | NULL | NULL |
| 239 | 2010-01-01 00:00:00 | 400 | 251 | 49 | NULL | NULL |
| 240 | 2010-01-01 00:00:00 | 400 | 251 | 49 | NULL | NULL |
| 241 | 2010-01-01 00:00:00 | 400 | 251 | 49 | NULL | NULL |
| 242 | 2010-01-01 00:00:00 | 400 | 251 | 49 | NULL | NULL |
| 243 | 2010-01-01 00:00:00 | 400 | 251 | 49 | NULL | NULL |
| 244 | 2010-01-01 00:00:00 | 400 | 251 | 49 | NULL | NULL |
| 245 | 2010-01-01 00:00:00 | 400 | 251 | 49 | NULL | NULL |
| 246 | 2010-02-01 00:00:00 | 400 | 596 | 49 | NULL | NULL |
| 247 | 2010-02-01 00:00:00 | 400 | 596 | 49 | NULL | NULL |
| 248 | 2010-02-01 00:00:00 | 400 | 596 | 49 | NULL | NULL |
| 249 | 2022-08-24 16:51:08 | 400 | 251 | 10 | NULL | NULL |
| 250 | 2022-08-24 16:52:34 | 400 | 251 | 10 | NULL | NULL |
| 251 | 2022-08-24 20:01:42 | 400 | 251 | 49 | VICKIE.BREWER@sakilacustomer.org | NULL |
| 252 | 2022-08-24 20:02:32 | 400 | 251 | 48 | VICKIE.BREWER@sakilacustomer.org | NULL |
| 253 | 2022-08-24 20:02:39 | 400 | 251 | 47 | VICKIE.BREWER@sakilacustomer.org | NULL |
| 254 | 2022-08-24 20:02:47 | 400 | 251 | 46 | VICKIE.BREWER@sakilacustomer.org | NULL |
| 255 | 2022-08-24 20:03:20 | 400 | 251 | 46 | Ioannischatzigeorgiou@gmail.com | NULL |
| 256 | 2022-08-24 20:03:25 | 400 | 251 | 46 | Ioannischatzigeorgiou@gmail.com | NULL |
| 257 | 2022-08-24 20:03:29 | 400 | 251 | 46 | Ioannischatzigeorgiou@gmail.com | NULL |
| 259 | 2022-08-24 20:15:33 | 400 | 251 | 49 | VICKIE.BREWER@sakilacustomer.org | NULL |
| 260 | 2022-08-24 20:16:23 | 400 | 251 | 49 | VICKIE.BREWER@sakilacustomer.org | NULL |
| 261 | 2022-08-24 20:16:28 | 400 | 251 | 49 | VICKIE.BREWER@sakilacustomer.org | NULL |
| 262 | 2022-08-24 20:17:18 | 400 | 251 | 49 | Ioannischatzigeorgiou@gmail.com | NULL |
| 263 | 2022-08-24 20:17:34 | 400 | 251 | 49 | Ioannischatzigeorgiou@gmail.com | NULL |
+-----+-----+-----+-----+-----+-----+
```

264	2022-08-24	20:17:37	400	251	49	Ioannischatzigeorgiou@gmail.com	NULL
265	2022-08-24	20:17:39	400	251	49	Ioannischatzigeorgiou@gmail.com	NULL
266	2022-08-24	20:55:46	400	251	49	VICKIE.BREWER@sakilacustomer.org	NULL
274	2022-08-24	21:00:21	400	596	10	Ioannischatzigeorgiou@gmail.com	NULL
275	2022-08-24	21:00:23	400	596	10	Ioannischatzigeorgiou@gmail.com	NULL
276	2022-08-24	21:00:25	400	596	10	Ioannischatzigeorgiou@gmail.com	NULL
277	2022-08-24	21:00:26	400	596	10	Ioannischatzigeorgiou@gmail.com	NULL
278	2022-08-24	21:00:26	400	596	10	Ioannischatzigeorgiou@gmail.com	NULL
279	2022-08-24	21:00:36	400	596	11	Ioannischatzigeorgiou@gmail.com	NULL
280	2022-08-24	21:00:52	401	596	119	Ioannischatzigeorgiou@gmail.com	NULL
283	2022-08-24	21:03:27	400	596	11	Ioannischatzigeorgiou@gmail.com	NULL
284	2022-08-24	21:03:56	400	596	11	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL
285	2022-08-24	21:03:59	400	596	11	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL
286	2022-08-24	21:04:04	400	596	12	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL
287	2022-08-24	21:04:43	400	596	13	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL
290	2022-08-24	21:11:24	402	251	13	VICKIE.BREWER@sakilacustomer.org	NULL
291	2022-08-24	21:11:33	402	251	13	VICKIE.BREWER@sakilacustomer.org	NULL
292	2022-08-24	21:11:35	402	251	13	VICKIE.BREWER@sakilacustomer.org	NULL
293	2022-08-24	21:12:35	402	251	13	VICKIE.BREWER@sakilacustomer.org	NULL
294	2022-08-24	21:13:23	402	251	13	Ioannischatzigeorgiou@gmail.com	NULL
295	2022-08-24	21:13:42	402	251	13	Ioannischatzigeorgiou@gmail.com	NULL
296	2022-08-24	21:13:44	402	251	13	Ioannischatzigeorgiou@gmail.com	NULL
297	2022-08-24	21:13:45	402	251	13	Ioannischatzigeorgiou@gmail.com	NULL
298	2022-08-25	00:43:45	402	251	13	Ioannischatzigeorgiou@gmail.com	NULL
299	2022-08-25	00:44:08	402	251	13	VICKIE.BREWER@sakilacustomer.org	NULL
300	2022-08-25	15:32:58	400	596	10	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL
301	2022-08-28	00:00:00	400	251	25	VICKIE.BREWER@sakilacustomer.org	NULL
302	2022-08-28	00:00:00	400	251	26	VICKIE.BREWER@sakilacustomer.org	NULL
303	2022-08-28	00:00:00	400	251	27	VICKIE.BREWER@sakilacustomer.org	NULL
304	2022-08-28	00:00:00	401	596	100	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL
305	2022-08-28	00:00:00	400	35	1	VIRGINIA.GREEN@sakilacustomer.org	NULL

70 rows in set (0,01 sec)

```
mysql> call Number_of_rentals('ENRIQUE.FORSYTHE@sakilacustomer.org','2022-08-24');
+-----+
| count_of_film_rentals |
+-----+
| 2 |
+-----+
1 row in set (0,00 sec)

+-----+
| count_of_series_rentals |
+-----+
| 12 |
+-----+
1 row in set (0,00 sec)

+-----+
| all_rentals |
+-----+
| 14 |
+-----+
1 row in set (0,00 sec)

Query OK, 4 rows affected (0,00 sec)

mysql> 
```

### 3.

```
CREATE PROCEDURE Monthly_revenue()
BEGIN
SELECT year(payment_date) as Year,month(payment_date) as Month,sum(amount) as Film_revenue
FROM payment_film GROUP BY year(payment_date),month(payment_date)
ORDER BY year(payment_date),month(payment_date);
SELECT year(payment_date) as Year,month(payment_date) as Month,sum(amount) as Series_revenue
FROM payment_series GROUP BY year(payment_date),month(payment_date)
ORDER BY year(payment_date),month(payment_date);
END$
```

### Παράδειγμα:

Αρχικά στις παρακάτω εικόνες έχουμε όλες τις πληρωμές, ξεχωριστά όμως για τις ενοικιάσεις επεισοδίων σειράς και ταινιών:

```

mysql> select * from payment_film;
+-----+-----+-----+-----+-----+-----+-----+
| payment_id | customer_id | rental_id | amount | payment_date | created_by | updated_by |
+-----+-----+-----+-----+-----+-----+-----+
| 21 | 3 | 11015 | 0.40 | 2010-01-01 10:01:00 | NULL | NULL |
| 22 | 3 | 11016 | 0.40 | 2010-02-01 10:01:00 | NULL | NULL |
| 23 | 3 | 11017 | 0.40 | 2010-03-01 10:01:00 | NULL | NULL |
| 24 | 596 | 11018 | 0.30 | 2010-01-01 10:01:00 | NULL | NULL |
| 25 | 596 | 11019 | 0.30 | 2010-02-01 10:01:00 | NULL | NULL |
| 26 | 596 | 11020 | 0.30 | 2010-03-01 10:01:00 | NULL | NULL |
| 29 | 3 | 11024 | 0.40 | 2010-01-01 23:50:00 | NULL | NULL |
| 30 | 596 | 11025 | 0.30 | 2010-02-01 12:00:01 | NULL | NULL |
| 31 | 596 | 11026 | 0.30 | 2010-02-01 12:00:01 | NULL | NULL |
| 45 | 596 | 11040 | 0.30 | 2010-02-01 00:00:00 | NULL | NULL |
| 46 | 596 | 11041 | 0.30 | 2010-02-01 00:00:00 | NULL | NULL |
| 47 | 596 | 11042 | 0.15 | 2010-02-01 00:00:00 | NULL | NULL |
| 48 | 596 | 11043 | 0.30 | 2010-02-01 00:00:00 | NULL | NULL |
| 49 | 596 | 11044 | 0.30 | 2010-02-01 00:00:00 | NULL | NULL |
| 50 | 596 | 11045 | 0.15 | 2010-02-01 00:00:00 | NULL | NULL |
| 51 | 596 | 11046 | 0.30 | 2010-02-01 00:00:00 | NULL | NULL |
| 52 | 596 | 11047 | 0.30 | 2010-02-01 00:00:00 | NULL | NULL |
| 53 | 596 | 11048 | 0.15 | 2010-02-01 00:00:00 | NULL | NULL |
| 54 | 3 | 11049 | 0.40 | 2022-08-24 16:48:20 | NULL | NULL |
| 55 | 3 | 11050 | 0.40 | 2022-08-24 19:25:50 | NULL | NULL |
| 56 | 3 | 11051 | 0.20 | 2022-08-24 19:27:18 | NULL | NULL |
| 58 | 3 | 11053 | 0.40 | 2022-08-24 19:36:18 | NULL | NULL |
| 59 | 3 | 11054 | 0.40 | 2022-08-24 19:38:05 | NULL | NULL |
| 60 | 3 | 11055 | 0.20 | 2022-08-24 19:40:04 | NULL | NULL |
| 61 | 3 | 11056 | 0.40 | 2022-08-24 20:45:33 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 62 | 3 | 11057 | 0.40 | 2022-08-24 20:48:24 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 63 | 3 | 11058 | 0.20 | 2022-08-24 20:48:57 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 64 | 596 | 11059 | 0.15 | 2022-08-24 21:04:35 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
| 65 | 596 | 11060 | 0.30 | 2022-08-24 21:04:37 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
| 66 | 3 | 11061 | 0.40 | 2022-08-28 00:00:00 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 67 | 3 | 11062 | 0.40 | 2022-08-28 00:00:00 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 68 | 3 | 11063 | 0.20 | 2022-08-28 00:00:00 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 69 | 3 | 11064 | 0.40 | 2022-08-28 00:00:00 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 70 | 3 | 11065 | 0.40 | 2022-08-28 00:00:00 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 71 | 3 | 11066 | 0.20 | 2022-08-28 00:00:00 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 72 | 3 | 11067 | 0.40 | 2022-08-28 00:00:00 | LINDA.WILLIAMS@sakilacustomer.org | NULL |
| 73 | 596 | 11068 | 0.30 | 2022-08-28 00:00:00 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
| 74 | 596 | 11069 | 0.30 | 2022-08-28 00:00:00 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
+-----+-----+-----+-----+-----+-----+-----+
38 rows in set (0,00 sec)

```

```

mysql> select * from payment_series;
+-----+-----+-----+-----+-----+-----+-----+
| payment_id | customer_id | rental_id | amount | payment_date | created_by | updated_by |
+-----+-----+-----+-----+-----+-----+-----+
| 89 | 251 | 215 | 0.20 | 2010-01-01 10:01:00 | NULL | NULL |
| 90 | 251 | 216 | 0.20 | 2010-02-01 10:01:00 | NULL | NULL |
| 91 | 251 | 217 | 0.20 | 2010-03-01 10:01:00 | NULL | NULL |
| 94 | 596 | 221 | 0.10 | 2010-01-01 10:01:00 | NULL | NULL |
| 95 | 596 | 222 | 0.10 | 2010-02-01 10:01:00 | NULL | NULL |
| 96 | 596 | 223 | 0.10 | 2010-03-01 10:01:00 | NULL | NULL |
| 101 | 251 | 230 | 0.20 | 2010-01-01 12:00:01 | NULL | NULL |
| 102 | 251 | 231 | 0.20 | 2010-01-01 12:00:01 | NULL | NULL |
| 103 | 251 | 232 | 0.20 | 2010-01-01 12:00:01 | NULL | NULL |
| 104 | 251 | 233 | 0.20 | 2010-01-01 12:00:01 | NULL | NULL |
| 105 | 596 | 234 | 0.10 | 2010-02-01 12:00:01 | NULL | NULL |
| 106 | 596 | 235 | 0.10 | 2010-02-01 12:00:01 | NULL | NULL |
| 107 | 596 | 236 | 0.10 | 2010-02-01 12:00:01 | NULL | NULL |
| 108 | 596 | 237 | 0.10 | 2010-02-01 12:00:01 | NULL | NULL |
| 109 | 596 | 238 | 0.10 | 2010-02-01 12:00:01 | NULL | NULL |
| 110 | 251 | 239 | 0.10 | 2010-01-01 00:00:00 | NULL | NULL |
| 111 | 251 | 240 | 0.20 | 2010-01-01 00:00:00 | NULL | NULL |
| 112 | 251 | 241 | 0.20 | 2010-01-01 00:00:00 | NULL | NULL |
| 113 | 251 | 242 | 0.10 | 2010-01-01 00:00:00 | NULL | NULL |
| 114 | 251 | 243 | 0.20 | 2010-01-01 00:00:00 | NULL | NULL |
| 115 | 251 | 244 | 0.20 | 2010-01-01 00:00:00 | NULL | NULL |
| 116 | 251 | 245 | 0.10 | 2010-01-01 00:00:00 | NULL | NULL |
| 117 | 596 | 246 | 0.10 | 2010-02-01 00:00:00 | NULL | NULL |
| 118 | 596 | 247 | 0.10 | 2010-02-01 00:00:00 | NULL | NULL |
| 119 | 596 | 248 | 0.05 | 2010-02-01 00:00:00 | NULL | NULL |
| 120 | 251 | 249 | 0.20 | 2022-08-24 16:51:08 | NULL | NULL |
| 121 | 251 | 250 | 0.20 | 2022-08-24 16:52:34 | NULL | NULL |
| 122 | 251 | 251 | 0.10 | 2022-08-24 20:01:42 | NULL | NULL |
| 123 | 251 | 252 | 0.20 | 2022-08-24 20:02:32 | NULL | NULL |
| 124 | 251 | 253 | 0.20 | 2022-08-24 20:02:39 | NULL | NULL |
| 125 | 251 | 254 | 0.10 | 2022-08-24 20:02:47 | NULL | NULL |
| 126 | 251 | 255 | 0.20 | 2022-08-24 20:03:20 | NULL | NULL |
| 127 | 251 | 256 | 0.20 | 2022-08-24 20:03:25 | NULL | NULL |
| 128 | 251 | 257 | 0.10 | 2022-08-24 20:03:29 | NULL | NULL |
| 130 | 251 | 259 | 0.20 | 2022-08-24 20:15:33 | NULL | NULL |
+-----+-----+-----+-----+-----+-----+-----+

```

```

+---+---+---+---+---+---+---+---+
| 131 | 251 | 260 | 0.20 | 2022-08-24 20:16:23 | NULL | NULL |
| 132 | 251 | 261 | 0.10 | 2022-08-24 20:16:28 | NULL | NULL |
| 133 | 251 | 262 | 0.20 | 2022-08-24 20:17:18 | NULL | NULL |
| 134 | 251 | 263 | 0.20 | 2022-08-24 20:17:34 | NULL | NULL |
| 135 | 251 | 264 | 0.10 | 2022-08-24 20:17:37 | NULL | NULL |
| 136 | 251 | 265 | 0.20 | 2022-08-24 20:17:39 | NULL | NULL |
| 137 | 251 | 266 | 0.20 | 2022-08-24 20:55:46 | VICKIE.BREWER@sakilacustomer.org | NULL |
| 138 | 596 | 274 | 0.10 | 2022-08-24 21:00:21 | Ioannischatziegeorgiou@gmail.com | NULL |
| 139 | 596 | 275 | 0.10 | 2022-08-24 21:00:23 | Ioannischatziegeorgiou@gmail.com | NULL |
| 140 | 596 | 276 | 0.05 | 2022-08-24 21:00:25 | Ioannischatziegeorgiou@gmail.com | NULL |
| 141 | 596 | 277 | 0.10 | 2022-08-24 21:00:26 | Ioannischatziegeorgiou@gmail.com | NULL |
| 142 | 596 | 278 | 0.10 | 2022-08-24 21:00:26 | Ioannischatziegeorgiou@gmail.com | NULL |
| 143 | 596 | 279 | 0.05 | 2022-08-24 21:00:36 | Ioannischatziegeorgiou@gmail.com | NULL |
| 144 | 596 | 280 | 0.10 | 2022-08-24 21:00:52 | Ioannischatziegeorgiou@gmail.com | NULL |
| 145 | 596 | 283 | 0.10 | 2022-08-24 21:03:27 | Ioannischatziegeorgiou@gmail.com | NULL |
| 146 | 596 | 284 | 0.05 | 2022-08-24 21:03:56 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
| 147 | 596 | 285 | 0.10 | 2022-08-24 21:03:59 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
| 148 | 596 | 286 | 0.10 | 2022-08-24 21:04:04 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
| 149 | 596 | 287 | 0.10 | 2022-08-24 21:04:43 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
| 150 | 251 | 290 | 0.10 | 2022-08-24 21:11:24 | VICKIE.BREWER@sakilacustomer.org | NULL |
| 151 | 251 | 291 | 0.20 | 2022-08-24 21:11:33 | VICKIE.BREWER@sakilacustomer.org | NULL |
| 152 | 251 | 292 | 0.20 | 2022-08-24 21:11:35 | VICKIE.BREWER@sakilacustomer.org | NULL |
| 153 | 251 | 293 | 0.10 | 2022-08-24 21:12:35 | VICKIE.BREWER@sakilacustomer.org | NULL |
| 154 | 251 | 294 | 0.20 | 2022-08-24 21:13:23 | Ioannischatziegeorgiou@gmail.com | NULL |
| 155 | 251 | 295 | 0.20 | 2022-08-24 21:13:42 | Ioannischatziegeorgiou@gmail.com | NULL |
| 156 | 251 | 296 | 0.10 | 2022-08-24 21:13:44 | Ioannischatziegeorgiou@gmail.com | NULL |
| 157 | 251 | 297 | 0.20 | 2022-08-24 21:13:45 | Ioannischatziegeorgiou@gmail.com | NULL |
| 158 | 251 | 298 | 0.20 | 2022-08-25 00:43:45 | Ioannischatziegeorgiou@gmail.com | NULL |
| 159 | 251 | 299 | 0.20 | 2022-08-25 00:44:08 | VICKIE.BREWER@sakilacustomer.org | NULL |
| 160 | 596 | 300 | 0.10 | 2022-08-25 15:32:58 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
| 161 | 251 | 301 | 0.20 | 2022-08-28 00:00:00 | VICKIE.BREWER@sakilacustomer.org | NULL |
| 162 | 251 | 302 | 0.20 | 2022-08-28 00:00:00 | VICKIE.BREWER@sakilacustomer.org | NULL |
| 163 | 251 | 303 | 0.10 | 2022-08-28 00:00:00 | VICKIE.BREWER@sakilacustomer.org | NULL |
| 164 | 596 | 304 | 0.05 | 2022-08-28 00:00:00 | ENRIQUE.FORSYTHE@sakilacustomer.org | NULL |
| 165 | 35 | 305 | 0.20 | 2022-08-28 00:00:00 | VIRGINIA.GREEN@sakilacustomer.org | NULL |
+---+---+---+---+---+---+---+
70 rows in set (0,00 sec)

mysql> 
```

Καλώντας την Monthly\_revenue βλέπουμε τα έσοδα ανά μήνα:

```

mysql> call Monthly_revenue();
+---+---+---+
| Year | Month | Film_revenue |
+---+---+---+
| 2010 | 1 | 1.10 |
| 2010 | 2 | 3.55 |
| 2010 | 3 | 0.70 |
| 2010 | 8 | 6.45 |
+---+---+---+
4 rows in set (0,00 sec)

+---+---+---+
| Year | Month | Series_revenue |
+---+---+---+
| 2010 | 1 | 2.20 |
| 2010 | 2 | 1.05 |
| 2010 | 3 | 0.30 |
| 2010 | 8 | 6.50 |
+---+---+---+
4 rows in set (0,00 sec)

Query OK, 0 rows affected (0,00 sec)
mysql> 
```

4.

a.

```

CREATE PROCEDURE Find_Actors(IN first VARCHAR(45),IN second VARCHAR(45))
BEGIN
DECLARE count INT(5);
SELECT first_name,last_name FROM actor WHERE last_name BETWEEN first AND second;
SELECT count(actor_id) INTO count FROM actor WHERE last_name BETWEEN first AND second;
SELECT count;
END$ 
```

**Παράδειγμα:**

```
mysql> call Find_Actors('Aco','Alm');
+-----+-----+
| first_name | last_name |
+-----+-----+
| Pranav    | Acosta
| Aydan     | Acosta
| Jazmyn    | Acosta
| Raiden    | Acosta
| Krystal   | Acosta
| Cooper    | Acosta
| Jamila   | Acosta
| Junior    | Acosta
| Keagan    | Acosta
| Christina | Acosta
| Howard    | Acosta
| Dustin    | Adams
| Keyon     | Adams
| Alexandria| Adams
| Jordyn    | Adams
| Monique   | Adams
| Abram     | Adams
| Esther    | Adams
| Annika   | Adkins
| Jerome   | Adkins
| Antony   | Adkins
| Shania   | Adkins
| Cristal   | Adkins
| Nicolas   | Adkins
| Josephine | Adkins
| Ayaan    | Adkins
| Jermaine  | Adkins
+-----+-----+
```

```
+-----+-----+
| Markus  | Aguilar
| Tania   | Aguilar
| Kate    | Aguilar
| Jadyn   | Aguilar
| Yasmin  | Aguilar
| Yosef   | Aguilar
| Nathalia| Aguilar
| Lisa    | Aguilar
| Sonia   | Aguilar
| Dawson  | Aguilar
| Emery   | Aguirre
| Elsie   | Aguirre
| Drake   | Aguirre
| Ruth   | Aguirre
| Joel    | Aguirre
| Axel   | Aguirre
| Olive   | Aguirre
| Everett | Aguirre
| Kaylynn | Aguirre
| Jett    | Aguirre
| Caiden  | Aguirre
| Mtikayla| Aguirre
| Antonio | Aguirre
| Dania   | Aguirre
| Nyasia  | Aguirre
| Ralph   | Aguirre
| Jan     | Alexander
| Terrence| Alexander
| Clara   | Alexander
| Jennifer| Alexander
| Zackery | Alexander
+-----+-----+
```

```
+-----+-----+
| Irvin   | Alexander
| Rosa   | Alexander
| Zariah  | Alexander
| Lina   | Ali
| Ellie   | Ali
| Kenzie  | Ali
| Belen  | Ali
| Siimeon | Allen
| Deegan  | Allen
| Moses   | Allen
| Madisyn | Allen
| Karsyn  | Allen
| Enrique | Allen
| Mcheal  | Allen
| Logan   | Allison
| Guadalupe| Allison
| Ele    | Allison
| Irene  | Allison
| Milton | Allison
| Miguel  | Allison
| Abdullah | Allison
| Zoey   | Allison
| Krish  | Allison
| Madlynn | Allison
| Itzel  | Allison
+-----+-----+
83 rows in set (0,01 sec)

+-----+
| count |
+-----+
| 83 |
+-----+
1 row in set (0,01 sec)
```

b.

```

CREATE PROCEDURE Find_Actor(IN input VARCHAR(45))
BEGIN
DECLARE g INT(5);
SELECT first_name ,last_name FROM actor WHERE last_name=input;
SELECT count(actor_id) INTO g FROM actor WHERE last_name=input;
SELECT g;
END$
```

### Παράδειγμα:

```

mysql> call Find_Actor('Russell');
+-----+-----+
| first_name | last_name |
+-----+-----+
| Nora       | Russell   |
| Conner     | Russell   |
| Santos     | Russell   |
| Ishaan     | Russell   |
| Trevon     | Russell   |
| Beckham    | Russell   |
| Alejandra   | Russell   |
| Janessa    | Russell   |
| Gaige      | Russell   |
| Alisa      | Russell   |
| Alvaro     | Russell   |
+-----+-----+
11 rows in set (0,00 sec)

+-----+
| g   |
+-----+
| 11 |
+-----+
1 row in set (0,00 sec)

Query OK, 1 row affected (0,00 sec)

mysql> ■
```

Χρησιμοποιήσαμε τον ακόλουθο index στον πίνακα actor μιάς και η αναζήτηση γινόταν βάσει του επωνύμου και στις δύο περιπτώσεις:

```

mysql> show index from actor;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Table | Non_unique | Key_name  | Seq_in_index | Column_name | Collation | Cardinality | Sub_part | Packed | Null | Index_type | Com-
| ment | Index_comment |          |             |             |           |             |          |          |          |          |          |          |          |          |          |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| actor |         0 | PRIMARY   |           1 | actor_id   | A          |      10294 |        NULL |        NULL |        | BTREE   |          | | | |
|       |         |           |             |             |           |             |          |          |          |          |          |          |          |          |
| actor |         1 | idx_actor |           1 | last_name  | A          |      2058  |        NULL |        NULL |        | BTREE   |          |
|       |         |           |             |             |           |             |          |          |          |          |          |          |          |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
2 rows in set (0,00 sec)

mysql> ■
```

Με κώδικα:

```
CREATE INDEX indx_actor ON actor(last_name);
```

## 4) Triggers

1)

Trigger που ενημερώνει τον πίνακα Logs.

```

CREATE TRIGGER after_payment_film
AFTER INSERT ON payment_film
FOR EACH ROW
BEGIN
INSERT INTO Logs(username,dateofevent,successfull,typos,pinakas)
VALUES(NEW.created_by,NOW(),1,'Eisagogi','payment_film');
END$
```

Trigger που ενημερώνει τον πίνακα Logs.

```

CREATE TRIGGER after_payment_series
AFTER INSERT ON payment_series
FOR EACH ROW
BEGIN
INSERT INTO Logs(username,dateofevent,successfull,typos,pinakas)
VALUES(NEW.created_by,NOW(),1,'Eisagogi','payment_series');
END$
```

```

CREATE TRIGGER cost_series
AFTER INSERT ON series_rental
FOR EACH ROW
BEGIN
DECLARE plithos1 INT;
DECLARE plithos2 INT;
DECLARE sub_type ENUM('Film','Series','Both');
SELECT subscription_type INTO sub_type FROM customer WHERE customer.customer_id=NEW.customer_id;
IF (sub_type='Series') THEN
    SELECT COUNT(*) INTO plithos1 FROM series_rental WHERE customer_id=NEW.customer_id AND
DATE(rental_date)=DATE(NEW.rental_date);
    IF (plithos1%3=0) THEN
        INSERT INTO payment_series(customer_id,rental_id,amount,payment_date,created_by)
VALUES(NEW.customer_id,NEW.rental_id,0.1,NEW.rental_date,NEW.created_by);
    ELSE
        INSERT INTO payment_series(customer_id,rental_id,amount,payment_date,created_by)
VALUES(NEW.customer_id,NEW.rental_id,0.2,NEW.rental_date,NEW.created_by);
    END IF;
ELSEIF (sub_type='Both') THEN
    SELECT COUNT(*) INTO plithos1 FROM film_rental WHERE customer_id=NEW.customer_id AND
DATE(rental_date)=DATE(NEW.rental_date);
    SELECT COUNT(*) INTO plithos2 FROM series_rental WHERE customer_id=NEW.customer_id AND
DATE(rental_date)=DATE(NEW.rental_date);
    IF ((plithos1+plithos2)%3=0) THEN
        INSERT INTO payment_series(customer_id,rental_id,amount,payment_date,created_by)
VALUES(NEW.customer_id,NEW.rental_id,0.05,NEW.rental_date,NEW.created_by);
    ELSE
        INSERT INTO payment_series(customer_id,rental_id,amount,payment_date,created_by)
VALUES(NEW.customer_id,NEW.rental_id,0.1,NEW.rental_date,NEW.created_by);
    END IF;
END IF;
INSERT INTO Logs(username,dateofevent,successfull,typos,pinakas)
VALUES(NEW.created_by,NOW(),1,'Eisagogi','series_rental');
END$
```

```

CREATE TRIGGER cost_Film
AFTER INSERT ON film_rental
FOR EACH ROW
BEGIN
DECLARE plithos1 INT;
DECLARE plithos2 INT;
DECLARE sub_type ENUM('Film','Series','Both');
SELECT subscription_type INTO sub_type FROM customer WHERE customer.customer_id=NEW.customer_id;
IF (sub_type='Film') THEN
    SELECT COUNT(*) INTO plithos1 FROM film_rental WHERE customer_id=NEW.customer_id AND
DATE(rental_date)=DATE(NEW.rental_date);
    IF (plithos1%3=0) THEN
        INSERT INTO payment_film(customer_id,rental_id,amount,payment_date,created_by)
VALUES(NEW.customer_id,NEW.rental_id,0.2,NEW.rental_date,NEW.created_by);
    ELSE

```

```

    INSERT INTO payment_film(customer_id,rental_id,amount,payment_date,created_by)
VALUES(NEW.customer_id,NEW.rental_id, 0.4,NEW.rental_date,NEW.created_by);
    END IF;
ELSEIF (sub_type='Both') THEN
    SELECT COUNT(*) INTO plithos1 FROM film_rental WHERE customer_id=NEW.customer_id AND
DATE(rental_date)=DATE(NEW.rental_date);
    SELECT COUNT(*) INTO plithos2 FROM series_rental WHERE customer_id=NEW.customer_id AND
DATE(rental_date)=DATE(NEW.rental_date);
    IF ((plithos1+plithos2)%3=0) THEN
        INSERT INTO payment_film(customer_id,rental_id,amount,payment_date,created_by)
VALUES(NEW.customer_id,NEW.rental_id,0.15,NEW.rental_date,NEW.created_by);
    ELSE
        INSERT INTO payment_film(customer_id,rental_id,amount,payment_date,created_by)
VALUES(NEW.customer_id,NEW.rental_id,0.3,NEW.rental_date,NEW.created_by);
    END IF;
END IF;
INSERT INTO Logs(username,dateofevent,successfull,typos,pinakas)
VALUES(NEW.created_by,NOW(),1,'Eisagogi','film_rental');
END$

CREATE TRIGGER after_update_series_rental
AFTER UPDATE ON series_rental
FOR EACH ROW
BEGIN
INSERT INTO Logs(username,dateofevent,successfull,typos,pinakas)
VALUES(NEW.updated_by,NOW(),1,'Enimerosi','series_rental');
END$

CREATE TRIGGER after_update_film_rental
AFTER UPDATE ON film_rental
FOR EACH ROW
BEGIN
INSERT INTO Logs(username,dateofevent,successfull,typos,pinakas)
VALUES(NEW.updated_by,NOW(),1,'Enimerosi','film_rental');
END$

CREATE TRIGGER after_update_payment_series
AFTER UPDATE ON payment_series
FOR EACH ROW
BEGIN
INSERT INTO Logs(username,dateofevent,successfull,typos,pinakas)
VALUES(NEW.updated_by,NOW(),1,'Enimerosi','payment_series');
END$

CREATE TRIGGER after_update_payment_film
AFTER UPDATE ON payment_film
FOR EACH ROW
BEGIN
INSERT INTO Logs(username,dateofevent,successfull,typos,pinakas)
VALUES(NEW.updated_by,NOW(),1,'Enimerosi','payment_film');
END$

```

Η διαφορά των πρώτων δύο trigger με τους δύο τελευταίους είναι ότι η ενημέρωση του πίνακα Logs γίνεται για διαφορετικό πίνακα (στους πρώτους δύο καταγράφεται επιτυχημένη αλλαγή στους πίνακες 'payment\_film' και 'payment\_series' ενώ στους υπόλοιπους γίνεται καταγραφή αλλαγής στους πίνακες 'film\_rental' και 'series\_rental').

### **Παραδείγματα:**

logid	username	dateofevent	successfull	typos	pinakas
1	LINDA.WILLIAMS@sakilacustomer.org	2022-08-24 16:48:20	1	Eisagogi	film_rental
3	VICKIE.BREWER@sakilacustomer.org	2022-08-24 16:52:34	1	Eisagogi	series_rental
4	LINDA.WILLIAMS@sakilacustomer.org	2022-08-24 19:36:18	1	Eisagogi	film_rental
5	LINDA.WILLIAMS@sakilacustomer.org	2022-08-24 19:38:05	1	Eisagogi	film_rental
6	Ioannischatzigeorgiou@gmail.com	2022-08-24 19:40:04	1	Eisagogi	film_rental
7	VICKIE.BREWER@sakilacustomer.org	2022-08-24 20:15:33	1	Eisagogi	series_rental
8	VICKIE.BREWER@sakilacustomer.org	2022-08-24 20:16:23	1	Eisagogi	series_rental
9	VICKIE.BREWER@sakilacustomer.org	2022-08-24 20:16:28	1	Eisagogi	series_rental
10	Ioannischatzigeorgiou@gmail.com	2022-08-24 20:17:18	1	Eisagogi	series_rental
11	Ioannischatzigeorgiou@gmail.com	2022-08-24 20:17:34	1	Eisagogi	series_rental
12	Ioannischatzigeorgiou@gmail.com	2022-08-24 20:17:37	1	Eisagogi	series_rental
13	Ioannischatzigeorgiou@gmail.com	2022-08-24 20:17:39	1	Eisagogi	series_rental
14	LINDA.WILLIAMS@sakilacustomer.org	2022-08-24 20:45:33	1	Eisagogi	film_rental
15	LINDA.WILLIAMS@sakilacustomer.org	2022-08-24 20:48:24	1	Eisagogi	payment_film
16	LINDA.WILLIAMS@sakilacustomer.org	2022-08-24 20:48:24	1	Eisagogi	film_rental
17	LINDA.WILLIAMS@sakilacustomer.org	2022-08-24 20:48:57	1	Eisagogi	payment_film
18	LINDA.WILLIAMS@sakilacustomer.org	2022-08-24 20:48:57	1	Eisagogi	film_rental
19	VICKIE.BREWER@sakilacustomer.org	2022-08-24 20:55:46	1	Eisagogi	payment_series
20	VICKIE.BREWER@sakilacustomer.org	2022-08-24 20:55:46	1	Eisagogi	series_rental
21	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:00:21	1	Eisagogi	payment_series
22	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:00:21	1	Eisagogi	series_rental
23	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:00:23	1	Eisagogi	payment_series
24	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:00:23	1	Eisagogi	series_rental
25	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:00:25	1	Eisagogi	payment_series
26	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:00:25	1	Eisagogi	series_rental
27	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:00:26	1	Eisagogi	payment_series
28	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:00:26	1	Eisagogi	series_rental
29	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:00:26	1	Eisagogi	payment_series
30	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:00:26	1	Eisagogi	series_rental

31	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:00:36	1	Eisagogi	payment_series
32	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:00:36	1	Eisagogi	series_rental
33	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:00:52	1	Eisagogi	payment_series
34	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:00:52	1	Eisagogi	series_rental
35	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:03:27	1	Eisagogi	payment_series
36	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:03:27	1	Eisagogi	series_rental
37	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-24 21:03:56	1	Eisagogi	payment_series
38	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-24 21:03:56	1	Eisagogi	series_rental
39	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-24 21:03:59	1	Eisagogi	payment_series
40	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-24 21:03:59	1	Eisagogi	series_rental
41	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-24 21:04:04	1	Eisagogi	payment_series
42	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-24 21:04:04	1	Eisagogi	series_rental
43	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-24 21:04:35	1	Eisagogi	payment_film
44	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-24 21:04:35	1	Eisagogi	film_rental
45	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-24 21:04:37	1	Eisagogi	payment_film
46	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-24 21:04:37	1	Eisagogi	film_rental
47	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-24 21:04:43	1	Eisagogi	payment_series
48	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-24 21:04:43	1	Eisagogi	series_rental
49	VICKIE.BREWER@sakilacustomer.org	2022-08-24 21:11:24	1	Eisagogi	payment_series
50	VICKIE.BREWER@sakilacustomer.org	2022-08-24 21:11:24	1	Eisagogi	series_rental
51	VICKIE.BREWER@sakilacustomer.org	2022-08-24 21:11:33	1	Eisagogi	payment_series
52	VICKIE.BREWER@sakilacustomer.org	2022-08-24 21:11:33	1	Eisagogi	series_rental
53	VICKIE.BREWER@sakilacustomer.org	2022-08-24 21:11:35	1	Eisagogi	payment_series
54	VICKIE.BREWER@sakilacustomer.org	2022-08-24 21:11:35	1	Eisagogi	series_rental
55	VICKIE.BREWER@sakilacustomer.org	2022-08-24 21:12:35	1	Eisagogi	payment_series
56	VICKIE.BREWER@sakilacustomer.org	2022-08-24 21:12:35	1	Eisagogi	series_rental
57	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:13:23	1	Eisagogi	payment_series
58	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:13:23	1	Eisagogi	series_rental
59	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:13:42	1	Eisagogi	payment_series
60	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:13:42	1	Eisagogi	series_rental
61	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:13:44	1	Eisagogi	payment_series
62	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:13:44	1	Eisagogi	series_rental

63	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:13:45	1	Eisagogi	payment_series
64	Ioannischatzigeorgiou@gmail.com	2022-08-24 21:13:45	1	Eisagogi	series_rental
65	Ioannischatzigeorgiou@gmail.com	2022-08-25 00:43:45	1	Eisagogi	payment_series
66	Ioannischatzigeorgiou@gmail.com	2022-08-25 00:43:45	1	Eisagogi	series_rental
67	VICKIE.BREWER@sakilacustomer.org	2022-08-25 00:44:08	1	Eisagogi	payment_series
68	VICKIE.BREWER@sakilacustomer.org	2022-08-25 00:44:08	1	Eisagogi	series_rental
69	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-25 15:32:58	1	Eisagogi	payment_series
70	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-25 15:32:58	1	Eisagogi	series_rental
71	LINDA.WILLIAMS@sakilacustomer.org	2022-08-28 00:00:00	1	Eisagogi	payment_film
72	LINDA.WILLIAMS@sakilacustomer.org	2022-08-28 01:57:53	1	Eisagogi	film_rental
73	LINDA.WILLIAMS@sakilacustomer.org	2022-08-28 00:00:00	1	Eisagogi	payment_film
74	LINDA.WILLIAMS@sakilacustomer.org	2022-08-28 01:58:03	1	Eisagogi	film_rental
75	LINDA.WILLIAMS@sakilacustomer.org	2022-08-28 00:00:00	1	Eisagogi	payment_film
76	LINDA.WILLIAMS@sakilacustomer.org	2022-08-28 02:00:08	1	Eisagogi	film_rental
77	LINDA.WILLIAMS@sakilacustomer.org	2022-08-28 00:00:00	1	Eisagogi	payment_film
78	LINDA.WILLIAMS@sakilacustomer.org	2022-08-28 02:00:14	1	Eisagogi	film_rental
79	LINDA.WILLIAMS@sakilacustomer.org	2022-08-28 00:00:00	1	Eisagogi	payment_film
80	LINDA.WILLIAMS@sakilacustomer.org	2022-08-28 02:02:59	1	Eisagogi	film_rental
81	LINDA.WILLIAMS@sakilacustomer.org	2022-08-28 00:00:00	1	Eisagogi	payment_film
82	LINDA.WILLIAMS@sakilacustomer.org	2022-08-28 02:03:51	1	Eisagogi	film_rental
83	LINDA.WILLIAMS@sakilacustomer.org	2022-08-28 00:00:00	1	Eisagogi	payment_film
84	LINDA.WILLIAMS@sakilacustomer.org	2022-08-28 02:04:03	1	Eisagogi	film_rental
85	VICKIE.BREWER@sakilacustomer.org	2022-08-28 00:00:00	1	Eisagogi	payment_series
86	VICKIE.BREWER@sakilacustomer.org	2022-08-28 11:17:48	1	Eisagogi	series_rental
87	VICKIE.BREWER@sakilacustomer.org	2022-08-28 00:00:00	1	Eisagogi	payment_series
88	VICKIE.BREWER@sakilacustomer.org	2022-08-28 11:17:59	1	Eisagogi	series_rental
89	VICKIE.BREWER@sakilacustomer.org	2022-08-28 00:00:00	1	Eisagogi	payment_series
90	VICKIE.BREWER@sakilacustomer.org	2022-08-28 11:18:02	1	Eisagogi	series_rental
91	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-28 00:00:00	1	Eisagogi	payment_film
92	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-28 11:22:32	1	Eisagogi	film_rental
93	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-28 00:00:00	1	Eisagogi	payment_film
94	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-28 11:22:36	1	Eisagogi	film_rental
95	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-28 00:00:00	1	Eisagogi	payment_series
96	ENRIQUE.FORSYTHE@sakilacustomer.org	2022-08-28 11:23:24	1	Eisagogi	series_rental
97	VIRGINIA.GREEN@sakilacustomer.org	2022-08-28 00:00:00	1	Eisagogi	payment_series
98	VIRGINIA.GREEN@sakilacustomer.org	2022-08-28 17:32:18	1	Eisagogi	series_rental

2)

Για την κοστολόγηση των σειρών(χορήγηση 50% έκπτωση σε όποιον πελάτη πάει να νοικιάσει κάθε τρίτη φορά μέσα στην ίδια μέρα):

```

CREATE TRIGGER cost_series
AFTER INSERT ON series_rental
FOR EACH ROW
BEGIN
DECLARE plithos1 INT;
DECLARE plithos2 INT;
DECLARE sub_type ENUM('Film','Series','Both');
SELECT subscription_type INTO sub_type FROM customer WHERE customer.customer_id=NEW.customer_id;
IF (sub_type='Series') THEN
    SELECT COUNT(*) INTO plithos1 FROM series_rental WHERE customer_id=NEW.customer_id AND
DATE(rental_date)=DATE(NEW.rental_date);
    IF (plithos1%3=0) THEN
        INSERT INTO payment_series(customer_id,rental_id,amount,payment_date,created_by)
VALUES(NEW.customer_id,NEW.rental_id,0.1,NEW.rental_date,NEW.created_by);
    ELSE
        INSERT INTO payment_series(customer_id,rental_id,amount,payment_date,created_by)
VALUES(NEW.customer_id,NEW.rental_id,0.2,NEW.rental_date,NEW.created_by);
    END IF;
ELSEIF (sub_type='Both') THEN
    SELECT COUNT(*) INTO plithos1 FROM film_rental WHERE customer_id=NEW.customer_id AND
DATE(rental_date)=DATE(NEW.rental_date);
    SELECT COUNT(*) INTO plithos2 FROM series_rental WHERE customer_id=NEW.customer_id AND
DATE(rental_date)=DATE(NEW.rental_date);
    IF ((plithos1+plithos2)%3=0) THEN
        INSERT INTO payment_series(customer_id,rental_id,amount,payment_date,created_by)
VALUES(NEW.customer_id,NEW.rental_id,0.05,NEW.rental_date,NEW.created_by);
    ELSE
        INSERT INTO payment_series(customer_id,rental_id,amount,payment_date,created_by)
VALUES(NEW.customer_id,NEW.rental_id,0.1,NEW.rental_date,NEW.created_by);
    END IF;
END IF;

```

```

END IF;
INSERT INTO Logs(username,dateofevent,successfull,typos,pinakas)
VALUES(NEW.created_by,NOW(),1,'Eisagogi','series_rental');
END$
```

**Παράδειγμα:**

151	251	291	0.20	2022-08-24 21:11:33	VICKIE.BREWER@sakilacustomer.org	NULL	
152	251	292	0.20	2022-08-24 21:11:35	VICKIE.BREWER@sakilacustomer.org	NULL	
153	251	293	0.10	2022-08-24 21:12:35	VICKIE.BREWER@sakilacustomer.org	NULL	
154	251	294	0.20	2022-08-24 21:13:23	Ioannischatzigeorgiou@gmail.com	NULL	
155	251	295	0.20	2022-08-24 21:13:42	Ioannischatzigeorgiou@gmail.com	NULL	
156	251	296	0.10	2022-08-24 21:13:44	Ioannischatzigeorgiou@gmail.com	NULL	
157	251	297	0.20	2022-08-24 21:13:45	Ioannischatzigeorgiou@gmail.com	NULL	

Για την κοστολόγηση των ταινιών:

```

CREATE TRIGGER cost_Film
AFTER INSERT ON film_rental
FOR EACH ROW
BEGIN
DECLARE plithos1 INT;
DECLARE plithos2 INT;
DECLARE sub_type ENUM('Film','Series','Both');
SELECT subscription_type INTO sub_type FROM customer WHERE customer.customer_id=NEW.customer_id;
IF (sub_type='Film') THEN
    SELECT COUNT(*) INTO plithos1 FROM film_rental WHERE customer_id=NEW.customer_id AND
DATE(rental_date)=DATE(NEW.rental_date);
    IF (plithos1%3=0) THEN
        INSERT INTO payment_film(customer_id,rental_id,amount,payment_date,created_by)
VALUES(NEW.customer_id,NEW.rental_id,0.2,NEW.rental_date,NEW.created_by);
    ELSE
        INSERT INTO payment_film(customer_id,rental_id,amount,payment_date,created_by)
VALUES(NEW.customer_id,NEW.rental_id, 0.4,NEW.rental_date,NEW.created_by);
    END IF;
ELSEIF (sub_type='Both') THEN
    SELECT COUNT(*) INTO plithos1 FROM film_rental WHERE customer_id=NEW.customer_id AND
DATE(rental_date)=DATE(NEW.rental_date);
    SELECT COUNT(*) INTO plithos2 FROM series_rental WHERE customer_id=NEW.customer_id AND
DATE(rental_date)=DATE(NEW.rental_date);
    IF ((plithos1+plithos2)%3=0) THEN
        INSERT INTO payment_film(customer_id,rental_id,amount,payment_date,created_by)
VALUES(NEW.customer_id,NEW.rental_id,0.15,NEW.rental_date,NEW.created_by);
    ELSE
        INSERT INTO payment_film(customer_id,rental_id,amount,payment_date,created_by)
VALUES(NEW.customer_id,NEW.rental_id,0.3,NEW.rental_date,NEW.created_by);
    END IF;
END IF;
INSERT INTO Logs(username,dateofevent,successfull,typos,pinakas)
VALUES(NEW.created_by,NOW(),1,'Eisagogi','film_rental');
END$
```

**Παράδειγμα:**

54	3	11049	0.40	2022-08-24	16:48:20	NULL	NULL	
55	3	11050	0.40	2022-08-24	19:25:50	NULL	NULL	
56	3	11051	0.20	2022-08-24	19:27:18	NULL	NULL	
58	3	11053	0.40	2022-08-24	19:36:18	NULL	NULL	
59	3	11054	0.40	2022-08-24	19:38:05	NULL	NULL	
60	3	11055	0.20	2022-08-24	19:40:04	NULL	NULL	
61	3	11056	0.40	2022-08-24	20:45:33	LINDA.WILLIAMS@sakilacustomer.org	NULL	
62	3	11057	0.40	2022-08-24	20:48:24	LINDA.WILLIAMS@sakilacustomer.org	NULL	
63	3	11058	0.20	2022-08-24	20:48:57	LINDA.WILLIAMS@sakilacustomer.org	NULL	
64	596	11059	0.15	2022-08-24	21:04:35	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL	
65	596	11060	0.30	2022-08-24	21:04:37	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL	
66	3	11061	0.40	2022-08-28	00:00:00	LINDA.WILLIAMS@sakilacustomer.org	NULL	
67	3	11062	0.40	2022-08-28	00:00:00	LINDA.WILLIAMS@sakilacustomer.org	NULL	
68	3	11063	0.20	2022-08-28	00:00:00	LINDA.WILLIAMS@sakilacustomer.org	NULL	
69	3	11064	0.40	2022-08-28	00:00:00	LINDA.WILLIAMS@sakilacustomer.org	NULL	
70	3	11065	0.40	2022-08-28	00:00:00	LINDA.WILLIAMS@sakilacustomer.org	NULL	
71	3	11066	0.20	2022-08-28	00:00:00	LINDA.WILLIAMS@sakilacustomer.org	NULL	
72	3	11067	0.40	2022-08-28	00:00:00	LINDA.WILLIAMS@sakilacustomer.org	NULL	

Παρατηρούμε κάθε τρίτη φορά που ο πελάτης(ταινίες μόνο) με id=3 πάει να νοικιάσει ταινία μέσα στην ίδια μέρα(σε αυτό το παράδειγμα έχουμε 2 μέρες τις 24/8/2022 και 28/8/2022 ) λαμβάνει 50% έκπτωση.

Για πελάτη που έχει συνδρομή και για σειρές και για ταινίες ακολουθεί το ακόλουθο παράδειγμα:

137	231	260	0.20	2022-08-24	20:33:46	VICKIE.BREWLER@sakilacustomer.org	NULL	
138	596	274	0.10	2022-08-24	21:00:21	Ioannischatzigeorgiou@gmail.com	NULL	
139	596	275	0.10	2022-08-24	21:00:23	Ioannischatzigeorgiou@gmail.com	NULL	
140	596	276	0.05	2022-08-24	21:00:25	Ioannischatzigeorgiou@gmail.com	NULL	
141	596	277	0.10	2022-08-24	21:00:26	Ioannischatzigeorgiou@gmail.com	NULL	
142	596	278	0.10	2022-08-24	21:00:26	Ioannischatzigeorgiou@gmail.com	NULL	
143	596	279	0.05	2022-08-24	21:00:36	Ioannischatzigeorgiou@gmail.com	NULL	
144	596	280	0.10	2022-08-24	21:00:52	Ioannischatzigeorgiou@gmail.com	NULL	
145	596	283	0.10	2022-08-24	21:03:27	Ioannischatzigeorgiou@gmail.com	NULL	
146	596	284	0.05	2022-08-24	21:03:56	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL	
147	596	285	0.10	2022-08-24	21:03:59	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL	
148	596	286	0.10	2022-08-24	21:04:04	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL	
149	596	287	0.10	2022-08-24	21:04:43	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL	

64	596	11059	0.15	2022-08-24	21:04:35	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL	
65	596	11060	0.30	2022-08-24	21:04:37	ENRIQUE.FORSYTHE@sakilacustomer.org	NULL	

3)

Ο πελάτης μπορεί να αλλάξει για τον εαυτό του και μόνο, το όνομα, το επώνυμο, την διεύθυνση, το αν είναι ενεργός ή όχι, τον τύπο εγγραφής του, ενώ δεν μπορεί να αλλάξει το email του, το id του και την ημερομηνία εγγραφής του. Αν τον επεξεργαστεί ένας υπάλληλος μπορεί να αλλάξει τα πάντα εκτός από το email. Αν είναι διαχειριστής μπορεί να αλλάξει τα πάντα.

```

CREATE TRIGGER Forbid_user_edit
BEFORE UPDATE ON customer
FOR EACH ROW
BEGIN
DECLARE xristis VARCHAR(50);
SELECT email INTO xristis FROM customer WHERE customer_id=OLD.customer_id;
IF(NEW.updated_by!=xristis AND (SELECT EXISTS(SELECT * FROM Employee where email=NEW.updated_by))=0
AND (SELECT EXISTS(SELECT * FROM Administrator where email=NEW.updated_by))=0) THEN
    SIGNAL SQLSTATE VALUE '45000'
    SET MESSAGE_TEXT='You cannot alter this customers info because you are either another customer or you
dont exist!';
END IF;
IF (NEW.updated_by=xristis AND (SELECT EXISTS(SELECT * FROM Employee where email=NEW.updated_by))=0
AND (SELECT EXISTS(SELECT * FROM Administrator where email=NEW.updated_by))=0 ) THEN
    IF ((NEW.email!=OLD.email OR NEW.customer_id!=OLD.customer_id OR NEW.create_date!
=OLD.create_date)) THEN
        SIGNAL SQLSTATE VALUE '45000'
        SET MESSAGE_TEXT=' You cannot alter data you have no access to!';
    END IF;
ELSEIF (NEW.updated_by!=xristis AND (SELECT EXISTS(SELECT * FROM Employee where
email=NEW.updated_by))=1 AND (SELECT EXISTS(SELECT * FROM Administrator where
email=NEW.updated_by))=0) THEN
    IF ((NEW.email!=OLD.email)) THEN
        SIGNAL SQLSTATE VALUE '45000'
    END IF;
END IF;

```

```

SET MESSAGE_TEXT=' You cannot alter data you have no access to!';
END IF;
ELSEIF (NEW.updated_by=xristis AND (SELECT EXISTS(SELECT * FROM Employee where
email=NEW.updated_by)=1 AND (SELECT EXISTS(SELECT * FROM Administrator where
email=NEW.updated_by)=0) THEN
    IF ((NEW.email!=OLD.email)) THEN
        SIGNAL SQLSTATE VALUE '45000'
        SET MESSAGE_TEXT=' You cannot alter data you have no access to!';
    END IF;
END IF;
END$
```

### Παράδειγμα:

```

|      51015 | antonio       | grigorio      | antonisgrigoriou@sakilacustomer.org |          7 |          1 | 2022-10-10 10:45:14 | Ser
ies
|      51016 | Ioannischatzigeorgiou@gmail.com | giannismakris@sakilaemployee.org |
+-----+-----+-----+-----+-----+-----+-----+
35 rows in set (0,00 sec)

mysql> update customer set customer_id=51016,updated_by='antonisgrigoriou@sakilacustomer.org' where customer_id=51015;
ERROR 1644 (45000): You cannot alter data you have no access to!
mysql>
```

```

mysql> update customer set email='okokok@gmail.com',updated_by='antonisgrigoriou@sakilacustomer.org' where customer_id=51015;
ERROR 1644 (45000): You cannot alter data you have no access to!
mysql>
```

```

mysql> update customer set create_date='2010-01-01 10:01:10',updated_by='antonisgrigoriou@sakilacustomer.org' where customer_id=51015;
ERROR 1644 (45000): You cannot alter data you have no access to!
mysql>
```

Άλλοι βοηθητικοί triggers που απαγορεύουν δημιουργία πληρωμής από πελάτη που δεν ανήκει στην αντίστοιχη κατηγορία από αυτή που έχει δηλώσει (και επιπλέον πράγματα όπως ένας πελάτης μπορεί να νοικιάσει μόνο για τον εαυτό του και για κανέναν άλλο πελάτη. Οι υπάλληλοι και διαχειριστές παρακάμπτουν τον περιορισμό αυτό). Ακόμη έχουμε triggers που απαγορεύουν την ενοικίαση περιεχομένου άλλης κατηγορίας από αυτή που έχει ο πελάτης καθώς και νοίκιαση επεισόδιου που ξεπερνά τον μέγιστο αριθμό επεισόδιων μίας σειράς. Για παράδειγμα αν μία σειρά έχει 120 επεισόδια (έστω 40 ανά κύκλο με 3 κύκλους) απαγορεύεται να νοικιάσει επεισόδια από το 121 και πάνω:

```

CREATE TRIGGER Forbid_film
BEFORE INSERT ON film_rental
FOR EACH ROW
BEGIN
DECLARE extra VARCHAR(50);
DECLARE elenxos VARCHAR(50);
DECLARE sub_type ENUM('Film','Series','Both');
SELECT email INTO elenxos FROM customer WHERE customer_id=NEW.customer_id;
SELECT subscription_type INTO sub_type FROM customer WHERE customer.customer_id=NEW.customer_id;
IF sub_type='Series' THEN
    SIGNAL SQLSTATE VALUE '45000'
    SET MESSAGE_TEXT='You cannot rent a film if you dont have a film or both subscription!';
END IF;
SELECT email INTO extra FROM customer WHERE customer_id=NEW.customer_id;
IF ((SELECT EXISTS(SELECT * FROM Employee where email=NEW.created_by))=0 AND (SELECT EXISTS(SELECT *
FROM Administrator where email=NEW.created_by))=0 AND (NEW.created_by!=extra)) THEN
    SIGNAL SQLSTATE VALUE '45000'
    SET MESSAGE_TEXT='You cannot rent a film for another person if you are not an Admin or an Employee!';
END IF;
END$
```

```

CREATE TRIGGER Forbid_payment_film
BEFORE INSERT ON payment_film
FOR EACH ROW
BEGIN
DECLARE sub_type ENUM('Film','Series','Both');
```

```

SELECT subscription_type INTO sub_type FROM customer WHERE customer.customer_id=NEW.customer_id;
IF sub_type='Series' THEN
SIGNAL SQLSTATE VALUE '45000'
SET MESSAGE_TEXT='You cannot pay for films if your subscription is : series only';
END IF;

END$


CREATE TRIGGER Forbid_payment_series
BEFORE INSERT ON payment_series
FOR EACH ROW
BEGIN
DECLARE sub_type ENUM('Film','Series','Both');
SELECT subscription_type INTO sub_type FROM customer WHERE customer.customer_id=NEW.customer_id;
IF sub_type='Film' THEN
SIGNAL SQLSTATE VALUE '45000'
SET MESSAGE_TEXT='You cannot pay for series if your subscription is : Film only!';
END IF;
END$


CREATE TRIGGER Forbid_series
BEFORE INSERT ON series_rental
FOR EACH ROW
BEGIN
DECLARE xristis VARCHAR(50);
DECLARE epeisodia SMALLINT(5);
DECLARE proto SMALLINT(5);
DECLARE sub_type ENUM('Film','Series','Both');
SELECT subscription_type INTO sub_type FROM customer WHERE customer.customer_id=NEW.customer_id;
SELECT email INTO xristis FROM customer WHERE customer.customer_id=NEW.customer_id;
IF sub_type='Film' THEN
SIGNAL SQLSTATE VALUE '45000'
SET MESSAGE_TEXT='You cannot rent series if you dont have a series or both subscription!';
END IF;
SET proto=0;
SET epeisodia=0;
SELECT series_id into proto from series_inventory where inventory_id=NEW.inventory_id;
select sum(number_of_episodes) into epeisodia from season where id_series=proto;
IF NEW.episode>epeisodia THEN
SIGNAL SQLSTATE VALUE '45000'
SET MESSAGE_TEXT='The episode you are trying to rent doesnt exist!';
END IF;
SET epeisodia=0;
IF ((SELECT EXISTS(SELECT * FROM Employee where email=NEW.created_by))=0 AND (SELECT EXISTS(SELECT *
FROM Administrator where email=NEW.created_by))=0 AND (NEW.created_by!=xristis)) THEN
SIGNAL SQLSTATE VALUE '45000'
SET MESSAGE_TEXT='You cannot rent a series episode for another person if you are not an Admin or an
Employee!';
END IF;
END$
```

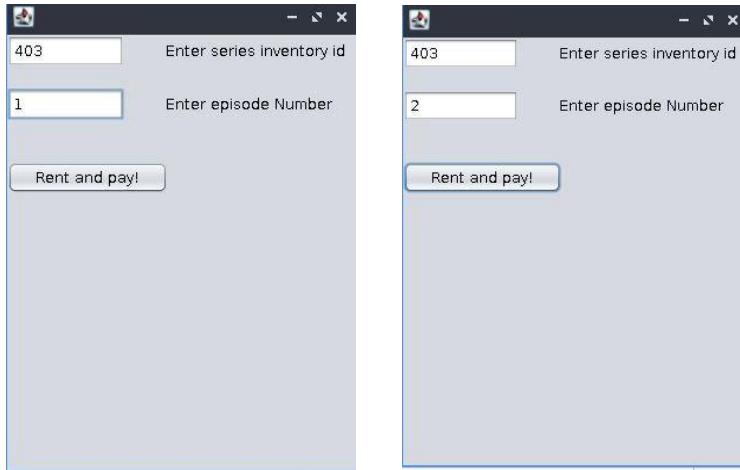
## Μέρος Β: GUIs

Διεπαφή Πελάτη(customer):



1)

Νέα ενοικίαση και πληρωμή:



```
mysql> select * from series_rental where customer_id=51015;
```

rental_id	rental_date	inventory_id	customer_id	episode	created_by	updated_by
306	2022-08-30 00:00:00	403	51015	1	antonisgrigoriou@sakilacustomer.org	NULL
307	2022-08-30 00:00:00	403	51015	2	antonisgrigoriou@sakilacustomer.org	NULL

2 rows in set (0,00 sec)

```
mysql> select * from payment_series where customer_id=51015;
```

payment_id	customer_id	rental_id	amount	payment_date	created_by	updated_by
166	51015	306	0.20	2022-08-30 00:00:00	antonisgrigoriou@sakilacustomer.org	NULL
167	51015	307	0.20	2022-08-30 00:00:00	antonisgrigoriou@sakilacustomer.org	NULL

2 rows in set (0,00 sec)

Προβολή στοιχείων του προφίλ του πελάτη:

customer_id	first_name	last_name	email	address_id	active	create_date	subscription_type	created_by	updated_by
51015	antonio	grigorio	antonisgrigoriou...	7	1	2022-10-10 10:45...	Series	ioannischatzgeor...	giannismakris@sa...

Προβολή περιεχομένου ανάλογα την εγγραφή:

inventory_id	series_id1	series_id2	title	description	language_id	original_langua...	release_year	special_features	rating	number_of_sea...
400	110	110	Etyvismenoi mazi	Family Adventures	1	1	2007-01-01 00:...	Trailers	G	2
401	111	111	H polýatolia	Block of flats ad...	1	1	2008-01-01 00:...	Trailers	G	3
402	112	112	Mhn arxzeis th...	Couple Adventu...	1	1	2014-01-01 00:...	Trailers	G	5
403	113	113	Klemmena oneira	Lives of 2 broth...	1	1	2011-01-01 00:...	Behind the Sce...	G	4
404	114	114	Friends	Everyday lives o...	1	1	2007-01-01 00:...	Trailers	G	3
405	115	115	Bing Bang Theory	University geniu...	2	1	2007-01-01 00:...	Deleted Scenes	PG	1
406	116	116	How i met your ...		4	1	2007-01-01 00:...	Trailers	PG-13	6
407	117	117	Mr Mercendes	A deadly merce...	3	1	2007-01-01 00:...	Behind the Sce...	R	4
408	118	118	Death Note	A notebook tha...	4	1	2007-01-01 00:...	Trailers	NC-17	2
409	119	119	Stavroi the eriet...		1	1	2007-01-01 00:...	Commentaries	G	2
410	120	120	To soi sou	Modern Family ...	1	1	2007-01-01 00:...	Trailers	G	2
411	121	121	Safe sex		1	1	2007-01-01 00:...	Trailers	G	2
412	122	122	Maria h asxhmh	Greek version o ...	1	1	2007-01-01 00:...	Behind the Sce...	PG-13	3

Πρόσβαση στα στοιχεία των ενοικιάσεων του:

rental_id	rental_date	inventory_id	customer_id	episode	created_by	updated_by
306	2022-08-30 00:00:00.0	403	51015	1	antonisgrigoriou@sakilacu...	
307	2022-08-30 00:00:00.0	403	51015	2	antonisgrigoriou@sakilacu...	

Αλλαγή του τύπου εγγραφής:

customer_id	first_name	last_name	email	address_id	active	create_date	subscription_type	created_by	updated_by
51015	antonio	grigorio	antonisgrigoriou...	7	1	2022-10-10 10:45...	Film	Ioannischatzigeor...	antonisgrigoriou...



Επεξεργασία πληροφοριών:

antoinne	First name
gregory	Last name
603	Address id
0	Active

```
mysql> select * from customer where customer_id=51015;
+-----+-----+-----+-----+-----+-----+-----+-----+
| customer_id | first_name | last_name | email | address_id | active | create_date | subscription_type |
| created_by | updated_by |          |        |           |       |            |                 |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 51015 | antonio | grigorio | antonisgrigoriou@sakilacustomer.org | 7 | 1 | 2022-10-10 10:45:14 | Series
| Ioannischatzigeorgiou@gmail.com | antonisgrigoriou@sakilacustomer.org |
+-----+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0,00 sec)

mysql> select * from customer where customer_id=51015;
+-----+-----+-----+-----+-----+-----+-----+-----+
| customer_id | first_name | last_name | email | address_id | active | create_date | subscription_type |
| created_by | updated_by |          |        |           |       |            |                 |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 51015 | antoine | gregory | antonisgrigoriou@sakilacustomer.org | 603 | 0 | 2022-10-10 10:45:14 | Series
| Ioannischatzigeorgiou@gmail.com | antonisgrigoriou@sakilacustomer.org |
+-----+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0,00 sec)
```

mysql> |

customer_id	first_name	last_name	email	address_id	active	create_date	subscription_type	created_by	updated_by
S1015	antoinne	gregory	antonisgrgoriou...	603	0	2022-10-10 10:45...	Series	IoannisChatzigeor...	antonisgrgoriou...

### Διεπαφή Υπάλληλου(Employee):

<a href="#">View Customer List</a>	<a href="#">Add Actor</a>
<a href="#">View Film Rentals</a>	<a href="#">Add Movie</a>
<a href="#">View Series Rentals</a>	<a href="#">Add Series</a>
<a href="#">View 5 Most Rent Films Of Last Month</a>	<a href="#">Add Languages</a>
<a href="#">View 5 Most Rent Series Of Last Month</a>	<a href="#">Add Categories</a>
<a href="#">Edit Customer Profile</a>	<a href="#">Add a new address</a>
<a href="#">Add Film Actor</a>	<a href="#">Add Film Category</a>
<a href="#">Add Series Actor</a>	<a href="#">Add Series Category</a>
<a href="#">Enter Film to Inventory</a>	<a href="#">Enter Series to Inventory</a>
<a href="#">Add City</a>	<a href="#">Add a Series Season</a>
<a href="#">Add Country</a>	

1)

Πρόσβαση στα στοιχεία των ενοικιάσεων των πελατών:

rental_id	rental_date	inventory_id	customer_id	created_by	updated_by
11015	2010-01-01 10:01:00.0	3456	3		
11016	2010-02-01 10:01:00.0	1	3		
11017	2010-03-01 10:01:00.0	3774	3		
11018	2010-01-01 10:01:00.0	1	596		
11019	2010-01-01 10:01:00.0	3774	596		
11020	2010-01-01 10:01:00.0	187	596		
11024	2010-01-01 23:50:00.0	1299	3		
11025	2010-02-01 12:00:01.0	1	596		
11026	2010-02-01 12:00:01.0	3774	596		
11040	2010-02-01 00:00:00.0	1	596		
11041	2010-02-01 00:00:00.0	1	596		
11042	2010-02-01 00:00:00.0	1	596		
11043	2010-02-01 00:00:00.0	1	596		
11044	2010-02-01 00:00:00.0	1	596		
11045	2010-02-01 00:00:00.0	1	596		
11046	2010-02-01 00:00:00.0	1	596		
11047	2010-02-01 00:00:00.0	1	596		
11048	2010-02-01 00:00:00.0	1	596		
11049	2022-08-24 16:48:20.0	1	3		
11050	2022-08-24 16:48:20.0	1	3	loannischatzegeorgiou@gmail.com	
11051	2022-08-24 18:27:18.0	1	3	LINDA.WILLIAMS@sakilacustomer...	
11052	2022-08-24 18:36:18.0	1	3	LINDA.WILLIAMS@sakilacustomer...	
11054	2022-08-24 18:39:05.0	1	3	LINDA.WILLIAMS@sakilacustomer...	
11055	2022-08-24 19:40:04.0	1	3	loannischatzegeorgiou@gmail.com	
11056	2022-08-24 20:45:33.0	1	3	LINDA.WILLIAMS@sakilacustomer...	
11057	2022-08-24 20:48:24.0	1	3	LINDA.WILLIAMS@sakilacustomer...	
11058	2022-08-24 20:48:57.0	1	3	LINDA.WILLIAMS@sakilacustomer...	
11059	2022-08-24 21:04:35.0	3774	596	ENRIQUE.FORSYTHE@sakilacusto...	
11060	2022-08-24 21:04:37.0	3774	596	ENRIQUE.FORSYTHE@sakilacusto...	
11061	2022-08-28 00:00:00.0	3773	3	LINDA.WILLIAMS@sakilacustomer...	
11062	2022-08-28 00:00:00.0	3774	3	LINDA.WILLIAMS@sakilacustomer...	
11063	2022-08-28 00:00:00.0	1	3	LINDA.WILLIAMS@sakilacustomer...	
11064	2022-08-28 00:00:00.0	1	3	LINDA.WILLIAMS@sakilacustomer...	
11065	2022-08-28 00:00:00.0	1	3	LINDA.WILLIAMS@sakilacustomer...	
11066	2022-08-28 00:00:00.0	3774	3	LINDA.WILLIAMS@sakilacustomer...	
11067	2022-08-28 00:00:00.0	3774	3	LINDA.WILLIAMS@sakilacustomer...	
11068	2022-08-28 00:00:00.0	1	596	ENRIQUE.FORSYTHE@sakilacusto...	
11069	2022-08-28 00:00:00.0	3774	596	ENRIQUE.FORSYTHE@sakilacusto...	

rental_id	rental_date	inventory_id	customer_id	episode	created_by	updated_by
215	2010-01-01 10:01:00.0	400	251	10		
216	2010-02-01 10:01:00.0	401	251	119		
217	2010-03-01 10:01:00.0	401	251	246		
221	2010-01-01 11:03:00.0	400	596	10		
222	2010-02-01 11:01:00.0	401	596	119		
223	2010-03-01 11:01:00.0	401	596	249		
230	2010-01-01 12:00:01.0	400	251	7		
231	2010-01-01 12:00:01.0	400	251	9		
232	2010-01-01 12:00:01.0	401	251	9		
233	2010-01-01 12:00:01.0	401	251	119		
234	2010-02-01 12:00:01.0	401	596	119		
235	2010-03-01 12:00:01.0	401	596	119		
236	2010-02-01 12:00:01.0	401	596	117		
237	2010-03-01 12:00:01.0	401	596	1		
238	2010-02-01 12:00:01.0	402	599	1		
239	2010-01-01 09:00:00.0	400	251	49		
240	2010-01-01 09:00:00.0	400	251	49		
241	2010-01-01 09:00:00.0	400	251	49		
242	2010-01-01 09:00:00.0	400	251	49		
243	2010-01-01 09:00:00.0	400	251	49		
244	2010-01-01 09:00:00.0	400	251	49		
245	2010-01-01 09:00:00.0	400	251	49		
246	2010-01-01 09:00:00.0	400	596	49		
247	2010-02-01 09:00:00.0	400	596	49		
248	2010-03-01 09:00:00.0	400	596	49		
249	2022-08-24 16:51:09.0	400	251	10	VICKIE.BREWER@sakilacust...	
250	2022-08-24 16:52:34.0	400	251	10	VICKIE.BREWER@sakilacust...	
251	2022-08-24 16:52:34.0	400	251	49	VICKIE.BREWER@sakilacust...	
252	2022-08-24 20:02:32.0	400	251	47	VICKIE.BREWER@sakilacust...	
253	2022-08-24 20:02:39.0	400	251	49	VICKIE.BREWER@sakilacust...	
254	2022-08-24 20:03:20.0	400	251	49	loannischatzegeorgiou@gm...	
255	2022-08-24 20:03:20.0	400	251	49	loannischatzegeorgiou@gm...	
256	2022-08-24 20:03:25.0	400	251	49	loannischatzegeorgiou@gm...	
257	2022-08-24 20:15:33.0	400	251	49	loannischatzegeorgiou@gm...	
258	2022-08-24 20:15:33.0	400	251	49	VICKIE.BREWER@sakilacust...	
259	2022-08-24 20:16:29.0	400	251	49	VICKIE.BREWER@sakilacust...	
260	2022-08-24 20:16:29.0	400	251	49	VICKIE.BREWER@sakilacust...	
261	2022-08-24 20:16:29.0	400	251	49	VICKIE.BREWER@sakilacust...	
262	2022-08-24 20:17:19.0	400	251	49	loannischatzegeorgiou@gm...	
263	2022-08-24 20:17:19.0	400	251	49	loannischatzegeorgiou@gm...	
264	2022-08-24 20:17:37.0	400	251	49	loannischatzegeorgiou@gm...	
265	2022-08-24 20:17:39.0	400	251	49	loannischatzegeorgiou@gm...	
266	2022-08-24 20:59:49.0	400	251	49	VICKIE.BREWER@sakilacust...	

274	2022-08-24 21:00:21.0	400	596	10	Ioannischatzgeorgiou@gm...
275	2022-08-24 21:00:23.0	400	596	10	Ioannischatzgeorgiou@gm...
276	2022-08-24 21:00:25.0	400	596	10	Ioannischatzgeorgiou@gm...
277	2022-08-24 21:00:26.0	400	596	10	Ioannischatzgeorgiou@gm...
278	2022-08-24 21:00:26.0	400	596	10	Ioannischatzgeorgiou@gm...
279	2022-08-24 21:00:36.0	400	596	11	Ioannischatzgeorgiou@gm...
280	2022-08-24 21:00:52.0	401	596	119	Ioannischatzgeorgiou@gm...
281	2022-08-24 21:03:00.0	400	596	11	Ioannischatzgeorgiou@gm...
282	2022-08-24 21:03:56.0	400	596	11	ENRIQUE.FORSYTHE@sakilacu...
285	2022-08-24 21:03:59.0	400	596	11	ENRIQUE.FORSYTHE@sakilacu...
286	2022-08-24 21:04:04.0	400	596	12	ENRIQUE.FORSYTHE@sakilacu...
287	2022-08-24 21:04:43.0	400	596	13	ENRIQUE.FORSYTHE@sakilacu...
290	2022-08-24 21:11:24.0	402	251	13	VICKIE.BREWER@sakilacust...
291	2022-08-24 21:11:33.0	402	251	13	VICKIE.BREWER@sakilacust...
292	2022-08-24 21:11:35.0	402	251	13	VICKIE.BREWER@sakilacust...
293	2022-08-24 21:12:35.0	402	251	13	VICKIE.BREWER@sakilacust...
294	2022-08-24 21:13:23.0	402	251	13	Ioannischatzgeorgiou@gm...
295	2022-08-24 21:13:42.0	402	251	13	Ioannischatzgeorgiou@gm...
296	2022-08-24 21:13:44.0	402	251	13	Ioannischatzgeorgiou@gm...
297	2022-08-24 21:13:45.0	402	251	13	Ioannischatzgeorgiou@gm...
298	2022-08-24 00:43:45.0	402	251	13	Ioannischatzgeorgiou@gm...
299	2022-08-25 00:08:00.0	402	251	13	VICKIE.BREWER@sakilacust...
300	2022-08-25 00:15:32.0	400	596	10	ENRIQUE.FORSYTHE@sakilacu...
301	2022-08-26 00:00:00.0	400	251	25	VICKIE.BREWER@sakilacust...
302	2022-08-28 00:00:00.0	400	251	26	VICKIE.BREWER@sakilacust...
303	2022-08-28 00:00:00.0	400	251	27	VICKIE.BREWER@sakilacust...
304	2022-08-28 00:00:00.0	401	596	100	ENRIQUE.FORSYTHE@sakila...
305	2022-08-28 00:00:00.0	400	35	1	VIRGINIA.GREEN@sakilacu...
306	2022-08-30 00:00:00.0	403	51015	1	antonisgrigorou@sakilacu...
307	2022-08-30 00:00:00.0	403	51015	2	antonisgrigorou@sakilacu...

### Προβολή λίστας πελατών:

customer_id	first_name	last_name	email	address_id	active	create_date	subscription_type	created_by	updated_by
3	LINDA	WILLIAMS	LINDA.WILLIAMS@s...	7	1	2006-02-14 22:04...	Film		
16	SANDRA	MARTIN	sASADda	20	0	2022-08-25 01:51...			Ioannischatzigeor...
35	VIRGINIA	GREEN	VIRGINIA.GREEN@...	39	1	2006-02-14 22:04...	Series		VIRGINIA.GREEN@...
52	JULIE	SANCHEZ	JULIE.SANCHEZ@...	56	1	2006-02-14 22:04...			
85	ANNE	PURCELL	ANNE.PURCELL@...	89	1	2006-02-14 22:04...			
104	RITA	GRAHAM	RITA.GRAHAM@...	108	1	2006-02-14 22:04...			
114	GRACE	ELLIS	GRACE.ELLIS@s...	118	1	2006-02-14 22:04...			
142	APRIL	BURNES	APRIL.BURNES@s...	148	1	2006-02-14 22:04...			
162	LAUREN	HUDSON	LAUREN.HUDSON	166	1	2006-02-14 22:04...			
195	VANESSA	SIMS	VANESSA.SIMS@...	199	1	2006-02-14 22:04...			
196	ALMA	AUSTIN	ALMA.AUSTIN@s...	200	1	2006-02-14 22:04...			
201	VICKI	FIELDS	VICKI.FIELDS@s...	205	1	2006-02-14 22:04...			
221	BESSIE	MORRISON	BESSIE.MORRISON...	225	1	2006-02-14 22:04...			
227	COLLEEN	BURTON	COLLEEN.BURTON...	231	1	2006-02-14 22:04...			
251	VICKIE	BREWER	VICKIE.BREWER@...	255	1	2006-02-14 22:04...	Series		
252	MATTIE	HOFFMAN	MATTIE.HOFFMAN...	256	1	2006-02-14 22:04...			
293	MAE	FLETCHER	MAE.FLETCHER@...	298	1	2006-02-14 22:04...			
309	CHRISTOPHER	GRECO	CHRISTOPHER.GRE...	314	1	2006-02-14 22:04...			
394	CHRIS	BROTHERS	CHR.BROTHERS...	399	1	2006-02-14 22:04...			
402	LUIS	YANEZ	LUIS.YANEZ@sakila...	407	1	2006-02-14 22:04...	Series		
438	ALEXANDER	PURCELL	ALEXANDER.PURCE...	447	1	2006-02-14 22:04...			
448	MIGUEL	BETANCOURT	MIGUEL.BETANCO...	453	1	2006-02-14 22:04...			
469	WESLEY	BULL	WESLEY.BULL@s...	474	1	2006-02-14 22:04...			
477	DAN	PAINÉ	DAN.PAINÉ@sakila...	482	1	2006-02-14 22:04...			
497	GILBERT	LEDGE	GILBERT.LEDGE@...	502	1	2006-02-14 22:04...			
499	MARC	OUTLAW	MARC.OUTLAW@s...	504	1	2006-02-14 22:04...			
512	CECIL	VINES	CECIL.VINES@s...	517	1	2006-02-14 22:04...			
525	ADRIAN	CLARY	ADRIAN.CLARY@...	531	1	2006-02-14 22:04...			
541	DARREN	WINDHAM	DARREN.WINDHAM...	547	1	2006-02-14 22:04...			
549	NELSON	CHRISTENSON	NELSON.CHRISTEN...	555	1	2006-02-14 22:04...			
556	ARMANDO	GRUBER	ARMANDO.GRUBE...	562	1	2006-02-14 22:04...			
596	ENRIQUE	FORSYTHE	ENRIQUE.FORSYTH...	602	1	2006-02-14 22:04...	Both		
6969	MARSHALL	THORN	MARSHALL.THORN...	589	1	2006-02-14 22:04...			
6973	alexandros	paparigopoulos	alexandros@papari...	7	1	2022-08-28 22:59...	Film	Ioannischatzigeor...	
51015	antoinne	gregory	antonisgrigorou...	603	0	2022-10-10 10:45...	Series	Ioannischatzigeor...	antonisgrigorou...

### Επεξεργασία όλων των στοιχείων εκτός του email:

51020 Antonia georgelou antonisgrigorou... 7 1 2022-02-03 14:24... Both Ioannischatzigeor... georgekalogirou... |

New Id	
New first name	Antonia
New last name	georgelou
New address	7
New active	1
New create date	022-02-03 14:24:21
New subscription type	Both

Εμφάνιση των 5 πρώτων ταινιών και σειρών με τις περισσότερες ενοικιάσεις το προηγούμενο μήνα από την εκτέλεση του ερωτήματος:

film_id	TOTAL
1	13
826	7

series_id	TOTAL
110	33
112	10
111	2
113	2

Διεπαφή Διαχειριστή(Administrator):

View Monthly Revenue	Promote Employee to Admin
Delete Employee	Demote Admin to Employee
Delete Customer	
Create New Employee	
Create New Customer	

Εμφάνιση συνολικών εσόδων ενοικιάσεων ανά μήνα:

Year	Month	Film_revenue
2010	1	1.1
2010	2	3.55
2010	3	0.7
2022	8	6.45

Year	Month	Series_revenue
2010	1	2.2
2010	2	1.05
2010	3	0.3
2022	8	6.9

Προαγωγή υπαλλήλου σε διαχειριστή:

```

| id | first_name | last_name | email | create_date | address_id |
| 10726 | Ioannis | Chatzigeorgiou | Ioannischatzigeorgiou@gmail.com | 2002-01-01 20:00:00 | 7 |
1 row in set (0,00 sec)

mysql> select * from Employee;
+-----+-----+-----+-----+-----+
| employee_id | first_name | last_name | email | create_date | address_id |
+-----+-----+-----+-----+-----+
| 2 | george | kalogirou | georgekalogirou@gmail.com | 2022-08-25 01:39:00 | 7 |
| 4 | dimitrios | papadopoulos | dimitriospapadopoulos@gmail.com | 2022-08-27 17:48:07 | 7 |
| 8 | giannis | makris | giannismakris@sakilaemployee.org | 2022-08-28 23:05:54 | 56 |
| 10 | alexandros | papageorgiou | alexandrosppapageorgiou@sakilacustomer.org | 2022-08-28 23:16:25 | 7 |
+-----+-----+-----+-----+-----+
4 rows in set (0,00 sec)

mysql> select * from Employee;
+-----+-----+-----+-----+-----+
| employee_id | first_name | last_name | email | create_date | address_id |
+-----+-----+-----+-----+-----+
| 4 | dimitrios | papadopoulos | dimitriospapadopoulos@gmail.com | 2022-08-27 17:48:07 | 7 |
| 8 | giannis | makris | giannismakris@sakilaemployee.org | 2022-08-28 23:05:54 | 56 |
| 10 | alexandros | papageorgiou | alexandrosppapageorgiou@sakilacustomer.org | 2022-08-28 23:16:25 | 7 |
+-----+-----+-----+-----+-----+
3 rows in set (0,00 sec)

mysql> select * from Administrator;
+-----+-----+-----+-----+
| id | first_name | last_name | email | create_date | address_id |
+-----+-----+-----+-----+
| 10726 | Ioannis | Chatzigeorgiou | Ioannischatzigeorgiou@gmail.com | 2002-01-01 20:00:00 | 7 |
| 10730 | george | kalogirou | georgekalogirou@gmail.com | 2022-08-30 18:41:16 | 7 |
+-----+-----+-----+-----+
2 rows in set (0,00 sec)

```

### Υποβάθμιση διαχειριστή σε υπάλληλο:

```

+-----+-----+-----+-----+-----+
| id | first_name | last_name | email | create_date | address_id |
+-----+-----+-----+-----+-----+
| 8 | giannis | makris | giannismakris@sakilaemployee.org | 2022-08-28 23:05:54 | 56 |
| 10 | alexandros | papageorgiou | alexandrosppapageorgiou@sakilacustomer.org | 2022-08-28 23:16:25 | 7 |
+-----+-----+-----+-----+
3 rows in set (0,00 sec)

mysql> select * from Administrator;
+-----+-----+-----+-----+
| id | first_name | last_name | email | create_date | address_id |
+-----+-----+-----+-----+
| 10726 | Ioannis | Chatzigeorgiou | Ioannischatzigeorgiou@gmail.com | 2002-01-01 20:00:00 | 7 |
| 10730 | george | kalogirou | georgekalogirou@gmail.com | 2022-08-30 18:41:16 | 7 |
+-----+-----+-----+-----+
2 rows in set (0,00 sec)

mysql> select * from Employee;
+-----+-----+-----+-----+-----+
| employee_id | first_name | last_name | email | create_date | address_id |
+-----+-----+-----+-----+-----+
| 4 | dimitrios | papadopoulos | dimitriospapadopoulos@gmail.com | 2022-08-27 17:48:07 | 7 |
| 8 | giannis | makris | giannismakris@sakilaemployee.org | 2022-08-28 23:05:54 | 56 |
| 10 | alexandros | papageorgiou | alexandrosppapageorgiou@sakilacustomer.org | 2022-08-28 23:16:25 | 7 |
| 11 | george | kalogirou | georgekalogirou@gmail.com | 2022-08-30 18:45:59 | 7 |
+-----+-----+-----+-----+
4 rows in set (0,00 sec)

mysql> select * from Administrator;
+-----+-----+-----+-----+
| id | first_name | last_name | email | create_date | address_id |
+-----+-----+-----+-----+
| 10726 | Ioannis | Chatzigeorgiou | Ioannischatzigeorgiou@gmail.com | 2002-01-01 20:00:00 | 7 |
+-----+-----+-----+-----+
1 row in set (0,00 sec)

mysql>

```

### Διαγραφή υπαλλήλου/Διαγραφή πελάτη:

```

mysql> select * from Employee;
+-----+-----+-----+-----+-----+
| employee_id | first_name | last_name | email | create_date | address_id |
+-----+-----+-----+-----+-----+
|        4 | dimitrios | papadopoulos | dimitriospapadopoulos@gmail.com | 2022-08-27 17:48:07 |      7 |
|        8 | giannis | makris | giannismakris@sakilaemployee.org | 2022-08-28 23:05:54 |     56 |
|       10 | alexandros | papageorgiou | alexandrosppageorgiou@sakilacustomer.org | 2022-08-28 23:16:25 |      7 |
|       11 | george | kalogrou | georgekalogrou@gmail.com | 2022-08-30 18:45:59 |      7 |
+-----+-----+-----+-----+-----+
4 rows in set (0,00 sec)

mysql> select * from Employee;
+-----+-----+-----+-----+-----+
| employee_id | first_name | last_name | email | create_date | address_id |
+-----+-----+-----+-----+-----+
|        4 | dimitrios | papadopoulos | dimitriospapadopoulos@gmail.com | 2022-08-27 17:48:07 |      7 |
|       10 | alexandros | papageorgiou | alexandrosppageorgiou@sakilacustomer.org | 2022-08-28 23:16:25 |      7 |
|       11 | george | kalogrou | georgekalogrou@gmail.com | 2022-08-30 18:45:59 |      7 |
+-----+-----+-----+-----+-----+
3 rows in set (0,01 sec)

mysql> 

```

email
LINDA.WILLIAMS@sakilacustomer.org
sasAdda
VIRGINIA.GREEN@sakilacustomer.org
JULIE.SANchez@sakilacustomer.org
ANNE.POVELL@sakilacustomer.org
RITA.GRAHAM@sakilacustomer.org
GRACE.ELLIS@sakilacustomer.org
APRIL.BURNS@sakilacustomer.org
LAUREN.HUDSON@sakilacustomer.org
VANESSA.SIMS@sakilacustomer.org
ALMA.AUSTIN@sakilacustomer.org
VICKI.FIELDS@sakilacustomer.org
BESSIE.MORRISON@sakilacustomer.org
COLLEEN.BURTON@sakilacustomer.org
VICKIE.BREWER@sakilacustomer.org
MATTIE.HOFFMAN@sakilacustomer.org
MAE.FLETCHER@sakilacustomer.org
CHRISTOPHER.GRECO@sakilacustomer.org
CHRIS.BROTHERS@sakilacustomer.org
LUIS.YANEZ@sakilacustomer.org
ALEXANDER.FENNELL@sakilacustomer.org
MIGUEL.BETANCOURT@sakilacustomer.org
WESLEY.BULL@sakilacustomer.org
DAN.PAINE@sakilacustomer.org
GILBERT.SLEDGE@sakilacustomer.org
MARC.OUTLAW@sakilacustomer.org
CECIL.VINES@sakilacustomer.org
ADRIAN.CLARY@sakilacustomer.org
DARREN.WINDHAM@sakilacustomer.org
NELSON.CHRISTENSON@sakilacustomer.org
ARMANDO.GRUBER@sakilacustomer.org
ENRIQUE.FORSYTHE@sakilacustomer.org
MARSHALL.THORN@sakilacustomer.org
alexandrospparigopoulos@gmail.com
antonisgrigoriou@sakilacustomer.org

email
ANNE.POVELL@sakilacustomer.org
RITA.GRAHAM@sakilacustomer.org
GRACE.ELLIS@sakilacustomer.org
APRIL.BURNS@sakilacustomer.org
LAUREN.HUDSON@sakilacustomer.org
VANESSA.SIMS@sakilacustomer.org
ALMA.AUSTIN@sakilacustomer.org
VICKI.FIELDS@sakilacustomer.org
COLLEEN.BURTON@sakilacustomer.org
VICKIE.BREWER@sakilacustomer.org
MATTIE.HOFFMAN@sakilacustomer.org
MAE.FLETCHER@sakilacustomer.org
CHRISTOPHER.GRECO@sakilacustomer.org
CHRIS.BROTHERS@sakilacustomer.org
LUIS.YANEZ@sakilacustomer.org
ALEXANDER.FENNELL@sakilacustomer.org
MIGUEL.BETANCOURT@sakilacustomer.org
WESLEY.BULL@sakilacustomer.org
DAN.PAINE@sakilacustomer.org
GILBERT.SLEDGE@sakilacustomer.org
MARC.OUTLAW@sakilacustomer.org
CECIL.VINES@sakilacustomer.org
ADRIAN.CLARY@sakilacustomer.org
DARREN.WINDHAM@sakilacustomer.org
NELSON.CHRISTENSON@sakilacustomer.org
ARMANDO.GRUBER@sakilacustomer.org
ENRIQUE.FORSYTHE@sakilacustomer.org
MARSHALL.THORN@sakilacustomer.org
alexandrospparigopoulos@gmail.com
antonisgrigoriou@sakilacustomer.org

34 rows in set (0,00 sec)

```

mysql> select email from customer where email='BESSIE.MORRISON@sakilacustomer.org';
Empty set (0,00 sec)

mysql> 

```

## Δημιουργία υπαλλήλου:

```

| CECIL.VINES@sakilacustomer.org | ADRIAN.CLARY@sakilacustomer.org |
| DARREN.WINDHAM@sakilacustomer.org | NELSON.CHRISTENSON@sakilacustomer.org |
| ARMANDO.GRUBER@sakilacustomer.org | ENRIQUE.FORSYTHE@sakilacustomer.org |
| MARSHALL.THORNGATE@sakilacustomer.org | alexandrosparagopoulos@gmail.com |
| alexandrosparagopoulos@gmail.com | antonisgrigoriou@sakilacustomer.org |
+-----+
34 rows in set (0,00 sec)

mysql> select email from customer where email='BESSIE.MORRISON@sakilacustomer.org';
Empty set (0,00 sec)

mysql> select * from Employee;
+-----+-----+-----+-----+-----+-----+
| employee_id | first_name | last_name | email | create_date | address_id |
+-----+-----+-----+-----+-----+-----+
| 4 | dimitrios | papadopoulos | dimitriospapadopoulos@gmail.com | 2022-08-27 17:48:07 | 7 |
| 10 | alejandro | pagegeorgiou | alexandrosparageorgiou@sakilacustomer.org | 2022-08-28 23:16:25 | 7 |
| 11 | george | kalogirou | georgekalogirou@gmail.com | 2022-08-30 18:45:59 | 7 |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0,00 sec)

mysql> select * from Employee;
+-----+-----+-----+-----+-----+-----+
| employee_id | first_name | last_name | email | create_date | address_id |
+-----+-----+-----+-----+-----+-----+
| 4 | dimitrios | papadopoulos | dimitriospapadopoulos@gmail.com | 2022-08-27 17:48:07 | 7 |
| 10 | alejandro | pagegeorgiou | alexandrosparageorgiou@sakilacustomer.org | 2022-08-28 23:16:25 | 7 |
| 11 | george | kalogirou | georgekalogirou@gmail.com | 2022-08-30 18:45:59 | 7 |
| 12 | giannis | merkouris | giannismerkouris@gmail.com | 2022-08-30 19:02:57 | 56 |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0,00 sec)

mysql> 

```

The screenshot shows the MySQL command-line interface with the following command and its output:

```

mysql> use sakila;
Database changed
mysql> insert into employee(first_name, last_name, email, create_date, address_id) values('giannis', 'merkouris', 'giannismerkouris@gmail.com', now(), 56);
Query OK, 1 row affected (0.00 sec)

```

A separate window titled "Add an Employee to your Database" is open, showing the input fields filled with the values entered in the MySQL command.

## Δημιουργία νέου πελάτη:

```

| ANNE.POWELL@sakilacustomer.org | RITA.GRAVES@sakilacustomer.org |
| DAUCE.LILLIS@sakilacustomer.org | APRIL.BURNS@sakilacustomer.org |
| LAUREN.HUDSON@sakilacustomer.org | VANESSA.SIMONS@sakilacustomer.org |
| ALMA.AUSTIN@sakilacustomer.org | VICKE.FIELDS@sakilacustomer.org |
| LUCILLE.DALTON@sakilacustomer.org | VICKIE.BREMER@sakilacustomer.org |
| MATTIE.HOFFMAN@sakilacustomer.org | MAE.FLETCHER@sakilacustomer.org |
| CHRISTOPHER.GRECO@sakilacustomer.org | CHRISTOPHER.GRECO@sakilacustomer.org |
| CHUCK.DANIELS@sakilacustomer.org | LUIS.YANEZ@sakilacustomer.org |
| ALEXANDER.FENNELL@sakilacustomer.org | MIGUEL.BETANCOURT@sakilacustomer.org |
| WESLEY.BULL@sakilacustomer.org | ZONI.PAIN@sakilacustomer.org |
| JILLIAN.PALMER@sakilacustomer.org | MARC.OUTLAWS@sakilacustomer.org |
| CECIL.VINES@sakilacustomer.org | ADRIAN.CLARY@sakilacustomer.org |
| DARREN.WINDHAM@sakilacustomer.org | NELSON.CHRISTENSON@sakilacustomer.org |
| ARMANDO.GRUBER@sakilacustomer.org | ENRIQUE.FORSYTHE@sakilacustomer.org |
| MARSHALL.THORNGATE@sakilacustomer.org | alexandrosparagopoulos@gmail.com |
| alexandrosparagopoulos@gmail.com | antonisgrigoriou@sakilacustomer.org |
+-----+
34 rows in set (0,00 sec)

mysql> select * from customer where email='anastasiainikolaou@sakilacustomer.org';
Empty set (0,00 sec)

mysql> select * from customer where email='anastasiainikolaou@sakilacustomer.org';
+-----+-----+-----+-----+-----+-----+-----+-----+
| customer_id | first_name | last_name | email | address_id | active | create_date | subscription_type | created_by | updated_by |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 51021 | anastasia | nikolaou | anastasiainikolaou@sakilacustomer.org | 56 | 1 | 2022-08-30 19:09:39 | Both | Ioannitschatzigeorgiou@gmail.com | NULL |
+-----+
1 row in set (0,00 sec)

mysql> 

```

The screenshot shows the MySQL command-line interface with the following command and its output:

```

mysql> use sakila;
Database changed
mysql> insert into customer(first_name, last_name, email, address_id, active, create_date, subscription_type, created_by) values('anastasia', 'nikolaou', 'anastasiainikolaou@sakilacustomer.org', 56, 1, now(), 'Both', 'Ioannitschatzigeorgiou@gmail.com');
Query OK, 1 row affected (0.00 sec)

```

A separate window titled "Create customer" is open, showing the input fields filled with the values entered in the MySQL command.

## Διεπαφή υπαλλήλου (Employee) (Συνέχεια...)

Ενημέρωση ταινιών με νέο περιεχόμενο:

```

DARREN.WINCHER@skilacustomer.org
NELSON.CHITSTENSON@skilacustomer.org
ARMANDO.GRUER@skilacustomer.org
ENRIQUE.FORSYTHE@skilacustomer.org
MARTHALL.THORNE@skilacustomer.org
alexandrosparigopoulos@gmail.com
antonisgrigoriou@skilacustomer.org
-----
34 rows in set (0,00 sec)

mysql> select * from customer where email='anastasiannikolaou@skilacustomer.org';
Empty set (0,00 sec)

mysql> select * from customer where email='anastasiannikolaou@skilacustomer.org';
+-----+-----+-----+-----+-----+
| customer_id | first_name | last_name | email           | address_id | active | create_date
+-----+-----+-----+-----+-----+
|      51021 | anastasia | nikolaou | anastasiannikolaou@skilacustomer.org |          56 |      1 | 2022-08-30
+-----+-----+-----+-----+-----+
1 row in set (0,00 sec)

mysql> select * from film where title='0 bakalagatos';
Empty set (0,01 sec)

mysql> select * from language;
+-----+-----+
| language_id | name
+-----+-----+
|      1       | English
|      2       | Italian
|      3       | French
|      4       | German
|      5       | Arabic
|      6       | Chinese
+-----+-----+
6 rows in set (0,00 sec)

mysql> select * from film where title='0 bakalagatos';
+-----+-----+-----+-----+-----+-----+-----+-----+
| film_id | title           | description        | release_year | language_id | original_language_id | length | rating | special_features
+-----+-----+-----+-----+-----+-----+-----+-----+
|     976 | 0 bakalagatos | An old greek movie |      1970    |          1   |                 1   |     60 | PG-13 | Trailers
+-----+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0,00 sec)

mysql>

```

Ενημέρωση σειρών με νέο περιεχόμενο:

```

mysql> select * from Series where title='H zoi ths allhs';
Empty set (0,00 sec)

mysql> select * from Series where title='H zoi ths allhs';
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| series_id | title           | description        | language_id | original_language_id | release_year | special_features | rating | number_of_seasons
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|      124 | H zoi ths allhs | A story of sister jealousy |          2   |                 1   |        2008      | Trailers      | PG-13 |          2
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0,00 sec)

mysql>

```

Ενημέρωση κύκλων σειράς:

```

mysql> select * from Series where title='H zoi ths allhs';
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| series_id | title | description | language_id | original_language_id | release_year | special_features | rating | number_of_seasons |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 124 | H zoi ths allhs | A story of sister jealousy | 2 | 1 | 2008 | Trailers | PG-13 | 2 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0,00 sec)

mysql> select * from season where id_series=124;
Empty set (0,00 sec)

mysql> select * from season where id_series=124;
+-----+-----+-----+-----+
| season_id | id_series | release_year | number_of_episodes |
+-----+-----+-----+-----+
| 39 | 124 | 2008 | 30 |
+-----+-----+-----+-----+
1 row in set (0,00 sec)

mysql> []

```

```

mysql> select * from Series where title='H zoi ths allhs';
Empty set (0,00 sec)

mysql> select * from Series where title='H zoi ths allhs';
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| series_id | title | description | language_id | original_language_id | release_year | special_features | rating | number_of_seasons |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 124 | H zoi ths allhs | A story of sister jealousy | 2 | 1 | 2008 | Trailers | PG-13 | 2 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0,00 sec)

mysql> select * from season where id_series=124;
Empty set (0,00 sec)

mysql> select * from season where id_series=124;
+-----+-----+-----+-----+
| season_id | id_series | release_year | number_of_episodes |
+-----+-----+-----+-----+
| 39 | 124 | 2008 | 30 |
+-----+-----+-----+-----+
1 row in set (0,00 sec)

mysql> []

```

```

mysql> select * from season where id_series=124;
+-----+-----+-----+-----+
| season_id | id_series | release_year | number_of_episodes |
+-----+-----+-----+-----+
| 39 | 124 | 2008 | 30 |
| 40 | 124 | 2009 | 30 |
+-----+-----+-----+-----+
2 rows in set (0,00 sec)

mysql> []

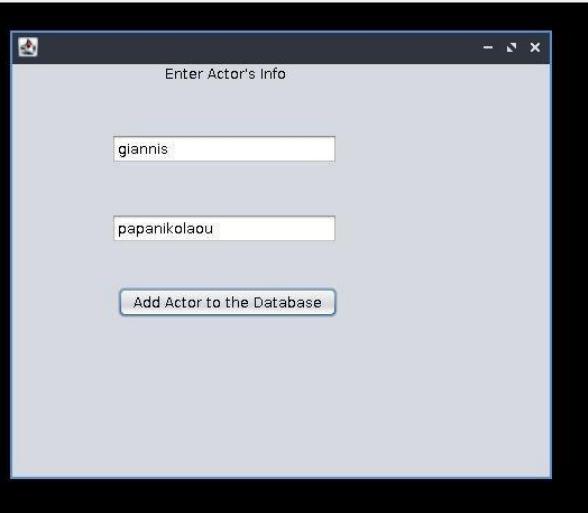
```

Ενημέρωση βάσης με νέο ηθοποιό:

```
mysql> select * from actor where first_name='giannis';
Empty set (0,01 sec)

mysql> select * from actor where first_name='giannis';
+-----+-----+
| actor_id | first_name | last_name |
+-----+-----+
| 10012 | giannis | papanikolaou |
+-----+-----+
1 row in set (0,02 sec)

mysql> 
```

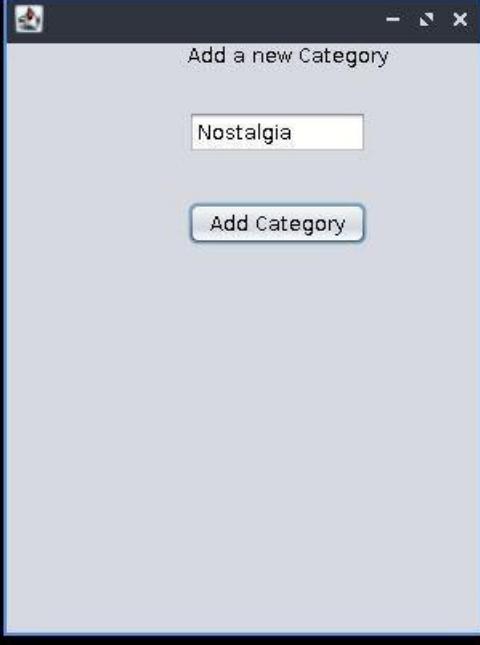


Ενημέρωση βάσης με νέα κατηγορία:

```
| 1 | Action      |
| 2 | Animation   |
| 3 | Children    |
| 4 | Classics    |
| 5 | Comedy      |
| 6 | Documentary |
| 7 | Drama       |
| 8 | Family      |
| 9 | Foreign     |
| 10 | Games      |
| 11 | Horror      |
| 12 | Music       |
| 13 | New         |
| 14 | Sci-Fi      |
| 15 | Sports      |
| 16 | Travel      |
| 17 | Mystery     |
+-----+
17 rows in set (0,01 sec)

mysql> select * from category;
+-----+-----+
| category_id | name   |
+-----+-----+
| 1           | Action |
| 2           | Animation |
| 3           | Children |
| 4           | Classics |
| 5           | Comedy |
| 6           | Documentary |
| 7           | Drama |
| 8           | Family |
| 9           | Foreign |
| 10          | Games |
| 11          | Horror |
| 12          | Music |
| 13          | New |
| 14          | Sci-Fi |
| 15          | Sports |
| 16          | Travel |
| 17          | Mystery |
| 18          | Nostalgia |
+-----+
18 rows in set (0,00 sec)

mysql> 
```



Ενημέρωση βάσης με νέα γλώσσα:

```

+-----+-----+
18 rows in set (0,00 sec)

mysql> select * from language;
+-----+-----+
| language_id | name   |
+-----+-----+
|      1 | English |
|      2 | Italian |
|      3 | French  |
|      4 | German  |
|      5 | Arabic   |
|      6 | Chinese |
+-----+-----+
6 rows in set (0,00 sec)

mysql> select * from language;
+-----+-----+
| language_id | name   |
+-----+-----+
|      1 | English |
|      2 | Italian |
|      3 | French  |
|      4 | German  |
|      5 | Arabic   |
|      6 | Chinese |
|      7 | Greek   |
+-----+-----+
7 rows in set (0,00 sec)

mysql> []

```



Ενημέρωση βάσης με προσθήκη ταινίας στον κατάλογο ταινιών:

```

mysql> select * from film_inventory where film_id=976;
Empty set (0,00 sec)

mysql> select * from film_inventory where film_id=976;
+-----+-----+
| inventory_id | film_id |
+-----+-----+
|      3976 |     976 |
+-----+-----+
1 row in set (0,00 sec)

mysql> []

```



Ενημέρωση καταλόγου σειρών με νέα σειρά:

```
mysql> select * from film_inventory where film_id=976;
Empty set (0,00 sec)

mysql> select * from film_inventory where film_id=976;
+-----+-----+
| inventory_id | film_id |
+-----+-----+
|      3976 |    976 |
+-----+-----+
1 row in set (0,00 sec)

mysql> select * from series_inventory where series_id=124;
Empty set (0,00 sec)

mysql> select * from series_inventory where series_id=124;
+-----+-----+
| inventory_id | series_id |
+-----+-----+
|      413 |     124 |
+-----+-----+
1 row in set (0,00 sec)

mysql> []
```



Ενημέρωση του film\_actor με νέο ηθοποιό:

```
mysql> select * from film_actor where actor_id=10012;
Empty set (0,00 sec)

mysql> select * from film_actor where actor_id=10012;
+-----+-----+
| actor_id | film_id |
+-----+-----+
|   10012 |    976 |
+-----+-----+
1 row in set (0,01 sec)

mysql> []
```



Ενημέρωση του series\_actor με νέο ηθοποιό:

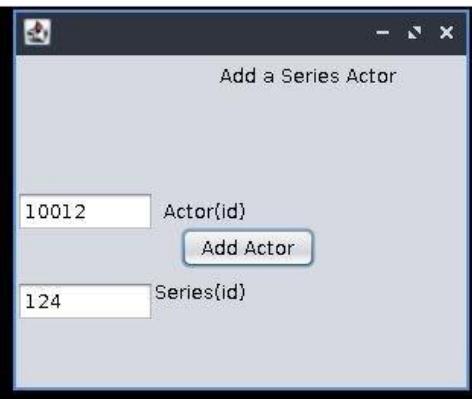
```

mysql> select * from series_actor where actor_id=10012;
Empty set (0,00 sec)

mysql> select * from series_actor where actor_id=10012;
+-----+
| actor_id | series_id |
+-----+
| 10012    |      124 |
+-----+
1 row in set (0,00 sec)

mysql> []

```



Ενημέρωση film\_category με νέα ταινία και κατηγορία:

```

mysql> select * from film_category where film_id=976 and category_id=18;
Empty set (0,00 sec)

mysql> select * from film_category where film_id=976 and category_id=18;
+-----+
| film_id | category_id |
+-----+
| 976     |      18 |
+-----+
1 row in set (0,01 sec)

mysql> []

```



Ενημέρωση series\_category με νέα σειρά και κατηγορία:

```

mysql> select * from series_category where series_id=124 and category_id=7;
Empty set (0,00 sec)

mysql> select * from series_category where series_id=124 and category_id=7;
+-----+
| series_id | category_id |
+-----+
| 124      |      7  |
+-----+
1 row in set (0,00 sec)

mysql> []

```



Ενημέρωση του country με νέα χώρα:

```
mysql> select * from country;
+-----+-----+
| country_id | country |
+-----+-----+
| 34 | France
| 38 | Germany
| 39 | Greece
| 49 | Italy
| 87 | Spain
| 102 | United Kingdom
| 103 | Portugal
+-----+
7 rows in set (0,00 sec)

mysql> select * from country;
+-----+-----+
| country_id | country |
+-----+-----+
| 34 | France
| 38 | Germany
| 39 | Greece
| 49 | Italy
| 87 | Spain
| 102 | United Kingdom
| 103 | Portugal
| 104 | Egypt
+-----+
8 rows in set (0,01 sec)

mysql> []
```



The screenshot shows the MySQL command-line interface. On the left, two identical SQL queries are run: 'select \* from country;'. The first query returns 7 rows, and the second returns 8 rows, with 'Egypt' added as the 8th row. On the right, a window titled 'Add New Country' is open, containing a text input field with 'Egypt' and a button labeled 'Add Country'.

Ενημέρωση του City με νέα πόλη:

```
mysql> select * from city where city='Alexandria';
Empty set (0,00 sec)

mysql> select * from city where city='Alexandria';
+-----+-----+-----+
| city_id | city      | country_id |
+-----+-----+-----+
| 592 | Alexandria |      104 |
+-----+-----+-----+
1 row in set (0,00 sec)

mysql> []
```



The screenshot shows the MySQL command-line interface. On the left, two identical SQL queries are run: 'select \* from city where city='Alexandria''. The first query returns an empty set, and the second query returns 1 row, with 'Alexandria' added as the 1st row. On the right, a window titled 'Add City' is open, containing two text input fields: one with 'Alexandria' labeled 'Enter city name' and another with '104' labeled 'Enter country(id)'. There is also a button labeled 'Add City'.

Ενημέρωση του Address με νέα διεύθυνση:

mysql> select \* from city where city='Alexandria';  
Empty set (0,00 sec)

mysql> select \* from city where city='Alexandria';  
+-----+-----+-----+  
| city\_id | city | country\_id |  
+-----+-----+-----+  
| 592 | Alexandria | 104 |  
+-----+-----+  
1 row in set (0,00 sec)

mysql> select \* from address where address='Mohhamed';  
Empty set (0,00 sec)

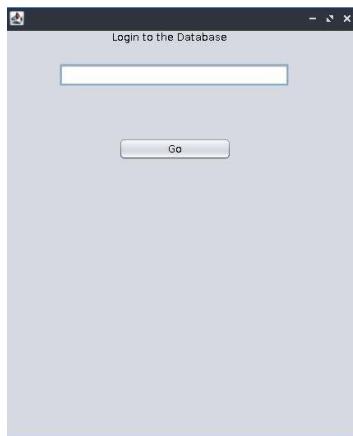
mysql> select \* from address where address='Mohhamed';  
+-----+-----+-----+-----+  
| address\_id | address | district | city\_id | postal\_code | phone |  
+-----+-----+-----+-----+  
| 604 | Mohhamed | Fara | 592 | 678123 | 012398223 |  
+-----+-----+-----+-----+  
1 row in set (0,00 sec)

mysql> []

The Java Swing application window titled "Address" displays the following data:

Address	District	City(id)	Action
Mohhamed	Fara	592	Add Address
		678123	T.K
		012398223	Phone

Login Διεπαφή μέσω email:



Για τη δημιουργία των γραφικών διεπαφών και τη διασύνδεση τους με τη βάση δεδομένων έχουμε χωρίσει τα αρχεία .java σε 3 κατηγορίες:

### 1) Κλάσεις java <Όνομα κλάσης>DAO.java

Χρησιμοποιούνται για να συνδεθούμε στη βάση και να αντλήσουμε δεδομένα από αυτή εκτελώντας ερωτήματα σε αυτή και stored procedures. Αυτό επιτυγχάνεται με διάφορες μεθόδους οι οποίες αποθηκεύουν τα δεδομένα σε δομές δεδομένων που φτιάχνουμε εμείς. Για παράδειγμα αφού συνδεθούμε με τη βάση και θέλουμε να αποθηκεύσουμε κάπου τη λίστα των πελατών το κάνουμε με μεθόδους που αποθηκεύουν το αποτέλεσμα(ένα ResultSet) σε μία δομή Customer(Customer.java).

### 2) Κλάσεις <Όνομα Κλάσης>.java

Χρησιμοποιούνται για να αποθηκευτούν σε αντικείμενα της δεδομένα που αντλούμε από τη βάση.

### 3) Κλάσεις <Όνομα Κλάσης>Model.java

Δημιουργούν “μοντέλα” πάνω στα οποία αποθηκεύουμε τα δεδομένα που αντλήσαμε από τη βάση. Στη συνέχεια τα ενσωματώνουμε σε κλήσεις των JTable και JFrame προκειμένου να απεικονιστούν στις γραφικές διεπαφές.

Επί το πλείστον ο υπόλοιπος κώδικας java ασχολείται με την εμφάνιση/απόκρυψη παραθύρων κατά το πάτημα ενός κουμπιού και τις ενέργειες πάνω στη βάση μετά τα πατήματα αυτά(insert,update,delete,κλήση procedure,select κτλπ). Αυτές οι εμφανίσεις/αποκρύψεις εξαρτώνται από το εάν υπάρχει ο χρήστης που εισάγουμε στη βάση καθώς και από τη κατηγορία του.