

COMP1044 Coursework Assignment 2

Final Report

Group 15 / Chew Language

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1 Report Part A

1.1 Entity Relation Diagram, 1st Iteration

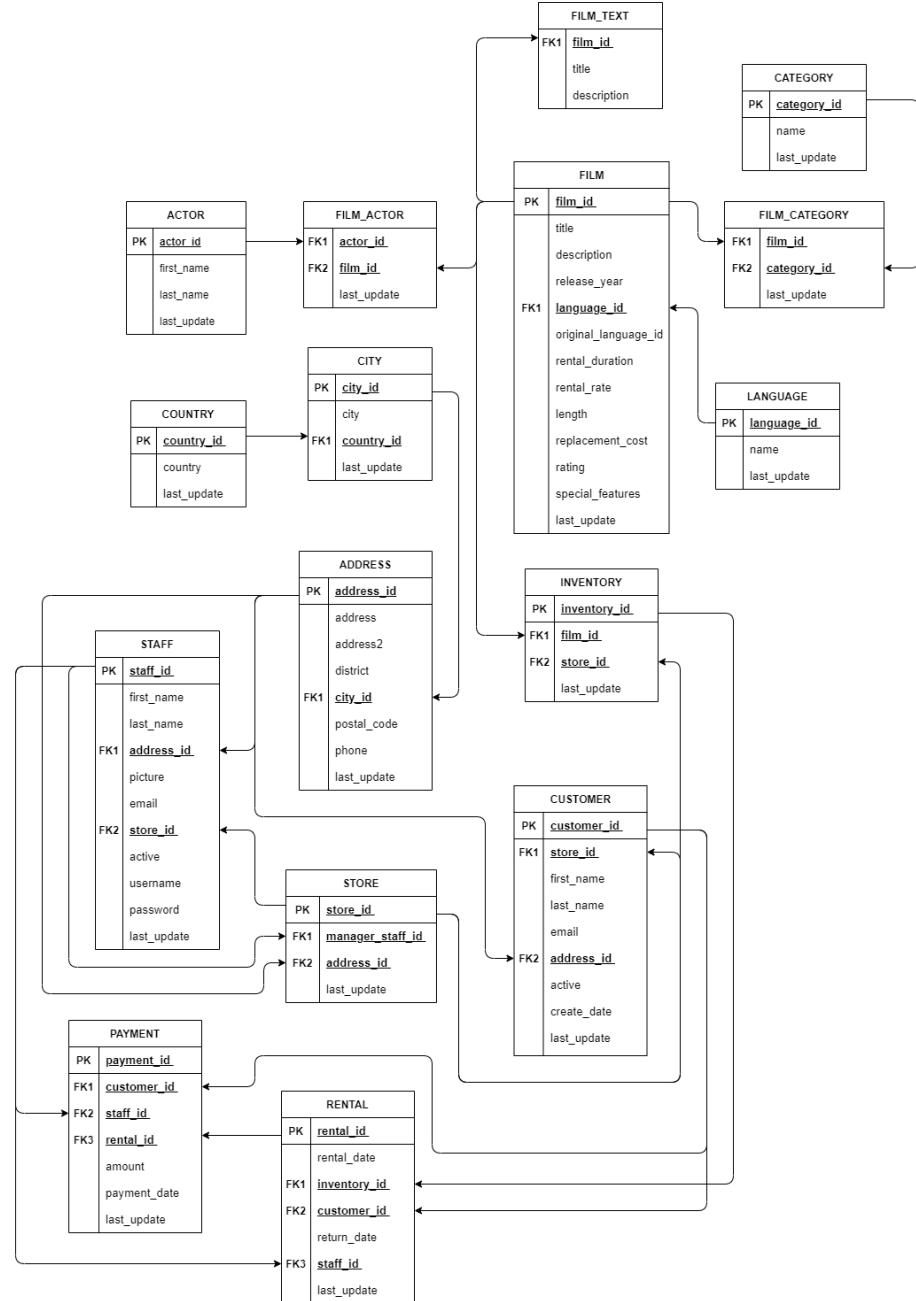


Figure 1: Proposed model for database.

1.2 Datatype Selection

For every field we chose the datatype depending on what would both match the data we had available and take up the lowest amount of memory possible while still ensuring that the type and length would be suitable for all new entries.

For most of the fields that were purely filled with numbers we set the type to either **int** or **decimal** (depending on whether the number was an integer or a decimal). A few examples of this are the *id* fields and the *length* and *rating* field in the *film* table. A notable exception to this was the *phone number* field. We set this datatype to **varchar** to allow people to enter their phone numbers in a different format despite all phone numbers in the dataset being integers. This was because many phone numbers need either a plus or a dash. Additionally, this field could be parsed and converted into an integer later if needed.

For all **varchar** we used the same principle but for the majority of fields we tried to keep the maximum lengths in neat values (normally multiples of 5). For instance, common values for the maximum length of **varchar** are 10, 25 and 50. We decided to set each field's maximum length to the longest realistic input value. For instance, we set *film_title* to **varchar(100)** as the longest name for a popular movie was 76 characters. We also set *first_name* and *last_name* to 50 as we thought that would be a good estimate based on actual estimates of the longest person names.

All date values were set to the type **datetime** according to their date and time content. For instance the *last_update* and *create_date* fields.

1.3 Reasoning for Primary and Foreign Key Choice

When we were deciding on what to pick for the primary key for each time we understood that it had to be both unique and non-null. This is because the primary key serves as the identifier for each record in the table and if it is either repeated or NULL it can no longer serve as an identifier. The obvious candidate here was the ID field in every table (for instance the *inventory_id* in the inventory table) as it fulfills both of these criteria.

The foreign key has the same requirements except that it need not be unique – only the primary key it references has to be unique. With this in mind we can use the same fields that we used as primary keys. Therefore for each of our arrays the *id* column is used to link the tables together. For instance, *customer_id* was chosen as the foreign key to link the *payment* table with the *customer* table and *address_id* was chosen as the foreign key to link the *staff* table with the

address table.

1.4 Completeness of the Dataset

The database was relatively complete and we did not struggle with the quality of the data. We found that the data values were consistent across the different tables. This meant that we didn't run into any issues regarding the foreign keys and we didn't find conflicting information in the data set.

We found a few different ways that the dataset was incomplete. The first was missing numbers from the auto-incremental data. For instance, there were missing *address_id*'s in *Address.csv*. This problem was easily remedied by enabling the property to **auto increment** during the creation of said file.

The next problem was that many NULL fields were invalid and are supposed to contain a value. For instance, some of the fields of *Rental_id* in *Payment.csv* were NULL when this should not have been the case. This is a problem as it may compromise the integrity of the database, as these NULL fields will lead to orphaned records due to the lack of a foreign key.

There was also a NULL value in the *password* column of the *staff.csv* table. This would indicate data corruption, data loss, or staff negligence in inputting a proper password. In the interest of system security, the best remedy would be to get the relevant staff member to provide a value for this NULL field. However, while the problem stands, we decided that it would be better to leave these fields as NULL to avoid risking data integrity.

1.5 Errors in the Database

We also noticed that in *country.csv* and *customer.csv* that there wasn't a consistent delimiter. The file alternated between using commas and semicolons to separate data. The lack of support for semicolon delimiters made it impossible to import the data into the database while keeping it in its intended format. To remedy this we replaced the semicolons with commas wherever applicable using text editors.

While studying the dataset, we discovered that some of the entries have been duplicated, such as the occurrence of two film descriptions in *film_text.csv* and *film.csv*. We can resolve this redundancy by removing a duplicate description field on one of the files.

Another error was the existence of a corrupted picture file within *staff.csv*. This corruption made it impossible to view or display the aforementioned picture. We decided that leaving a corrupted picture within the staff database was not

of high importance and wouldn't decrease the completeness or understandability of the dataset, so we just removed the picture. A partial solution was found in making the field type storing the picture as **longblob**.

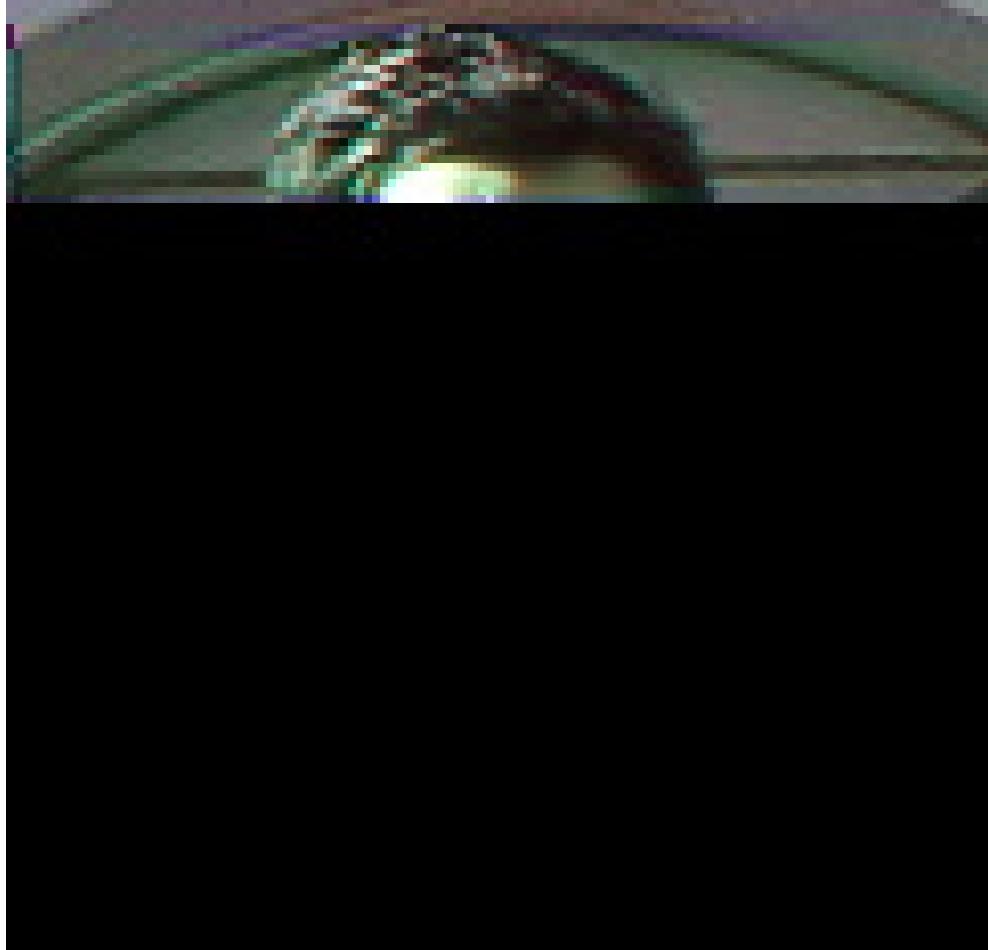


Figure 2: The partially recovered staff photo.

This allowed the picture to be imported, albeit still in an incomplete state.

1.6 Conclusion

At the point of writing, the team determined the database to be sufficient for further usage, due to SELECT queries functioning properly when used to select specific rows in the tables.

2 Report Part B

Entity Relation Diagram (For Reference)

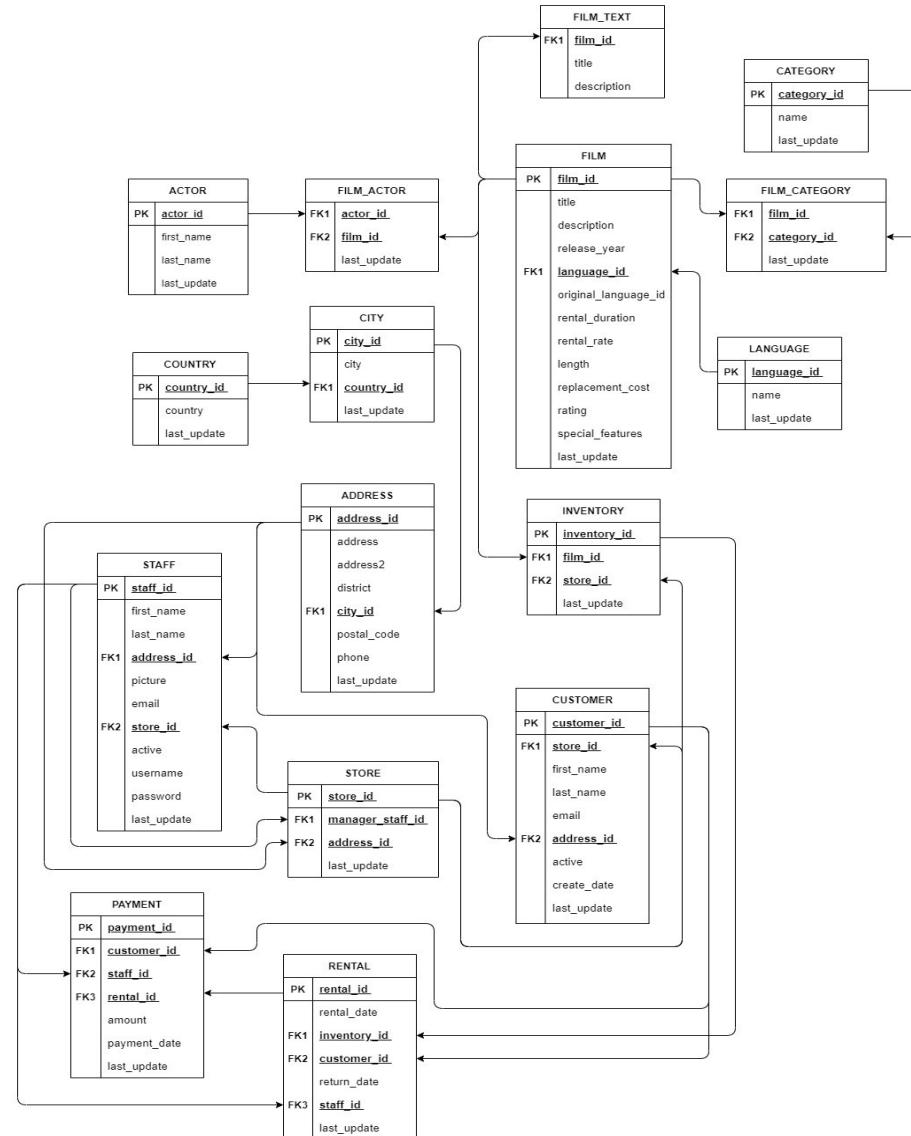


Figure 3: Proposed Entity Relation Diagram arrangement. ¹

¹This diagram is based on available table data provided.

2.1 Database Creation

```

1 CREATE DATABASE Entertainment;

```

Figure 4: Creation of database "Entertainment"

2.2 Creation and Insertion of Tables

```

1 CREATE TABLE `actor` (
2   `actor_id` int(3) NOT NULL,
3   `first_name` varchar(11) DEFAULT NULL,
4   `last_name` varchar(12) DEFAULT NULL,
5   `last_update` datetime DEFAULT NULL,
6 ) ENGINE=InnoDB DEFAULT CHARSET=utf8;
7
8 /**
9  * Dumping data for table `actor`
10 */
11
12 INSERT INTO `actor` (`actor_id`, `first_name`, `last_name`, `last_update`) VALUES
13 (1, 'PENELOPE', 'GUINNESS', '2006-02-15 04:34:33'),
14 (2, 'NICK', 'WAHLBERG', '2006-02-15 04:34:33'),
15 (3, 'TRAVIS', 'CHASE', '2006-02-15 04:34:33'),
16 (4, 'JEREMY', 'TAYLOR', '2006-02-15 04:34:33'),
17 (5, 'JOHNNY', 'CULOBREGIDA', '2006-02-15 04:34:33'),
18 (6, 'BETTE', 'NICHOLSON', '2006-02-15 04:34:33'),
19 (7, 'GRACE', 'MOTEL', '2006-02-15 04:34:33'),
20 (8, 'MATTHEW', 'JOHANSSON', '2006-02-15 04:34:33'),
21 (9, 'JOE', 'SWANK', '2006-02-15 04:34:33'),
22 (10, 'CHRISTIAN', 'GARIA', '2006-02-15 04:34:33'),
23 (11, 'LEGO', 'CAGE', '2006-02-15 04:34:33'),
24 (12, 'KARL', 'BERRY', '2006-02-15 04:34:33'),

```

Figure 5: Creation and Insertion of table "Actor"

```

1 CREATE TABLE `address` (
2   `address_id` int(10) unsigned NOT NULL,
3   `address` varchar(38) DEFAULT NULL,
4   `address2` varchar(10) DEFAULT NULL,
5   `district` varchar(20) DEFAULT NULL,
6   `city_id` int(3) DEFAULT NULL,
7   `postal_code` bigint(12) DEFAULT NULL,
8   `phone` bigint(12) DEFAULT NULL,
9   `last_update` datetime DEFAULT NULL,
10 ) ENGINE=InnoDB DEFAULT CHARSET=utf8;
11
12 /**
13  * Dumping data for table `address`
14 */
15
16 INSERT INTO `address` (`address_id`, `address`, `address2`, `district`, `city_id`, `postal_code`, `phone`, `last_update`) VALUES
17 (1, '47 MySakila Drive', '', 'Alberta', 300, NULL, '2014-09-25 22:30:27'),
18 (2, '28 MySQL Boulevard', '', 'QBD', 576, NULL, '2014-09-25 22:30:09'),
19 (3, '23 Workhaven Lane', '', 'Alberta', 300, NULL, 14033335568, '2014-09-25 22:30:27'),
20 (4, '123 MySakila Street', '', 'Alberta', 300, NULL, 14033335569, '2014-09-25 22:30:27'),
21 (5, '1913 Manzi Way', '', 'Nagasaki', 463, 35200, 28703184290, '2014-09-25 22:31:53'),
22 (6, '1121 Loja Avenue', '', 'Californie', 449, 17886, 818635000000, '2014-09-25 22:34:01'),
23 (7, '692 Joliet Street', '', 'Attika', 38, 83579, 448477000000, '2014-09-25 22:31:07'),
24 (8, '1566 Ingl Manor', '', 'Mandalay', 349, 53561, 705814000000, '2014-09-25 22:32:18'),

```

Figure 6: Creation and Insertion of table "Address"

```

1 CREATE TABLE `category` (
2   `category_id` int(11) NOT NULL,
3   `name` varchar(255) DEFAULT NULL,
4   `last_update` datetime DEFAULT NULL
5 ) ENGINE=InnoDB DEFAULT CHARSET=utf8;
6
7 --
8 -- Dumping data for table `category`
9 --
10
11 INSERT INTO `category` (`category_id`, `name`, `last_update`) VALUES
12 (1, 'Action', '2006-02-15 04:46:27'),
13 (2, 'Animation', '2006-02-15 04:46:27'),
14 (3, 'Comics', '2006-02-15 04:46:27'),
15 (4, 'Classics', '2006-02-15 04:46:27'),
16 (5, 'Comedy', '2006-02-15 04:46:27'),
17 (6, 'Documentary', '2006-02-15 04:46:27'),
18 (7, 'Drama', '2006-02-15 04:46:27'),
19 (8, 'Family', '2006-02-15 04:46:27'),
20 (9, 'Thriller', '2006-02-15 04:46:27'),
21 (10, 'Game', '2006-02-15 04:46:27'),
22 (11, 'Horror', '2006-02-15 04:46:27'),
23 (12, 'Music', '2006-02-15 04:46:27'),
24 (13, 'New', '2006-02-15 04:46:27'),
25 (14, 'Sci-Fi', '2006-02-15 04:46:27'),
26 (15, 'Sports', '2006-02-15 04:46:27'),
27 (16, 'Travel', '2006-02-15 04:46:27');

```

Figure 7: Creation and Insertion of table "Category"

```

1 CREATE TABLE `city` (
2   `city_id` int(3) NOT NULL,
3   `city` varchar(24) DEFAULT NULL,
4   `country_id` int(3) DEFAULT NULL,
5   `last_update` datetime DEFAULT NULL
6 ) ENGINE=InnoDB DEFAULT CHARSET=utf8;
7
8 --
9 -- Dumping data for table `city`
10 --
11
12 INSERT INTO `city` (`city_id`, `city`, `country_id`, `last_update`) VALUES
13 (1, 'A Corua (La Corua)', 87, '2006-02-15 04:45:25'),
14 (2, 'Abha', 82, '2006-02-15 04:45:25'),
15 (3, 'Abu Dhabi', 101, '2006-02-15 04:45:25'),
16 (4, 'Acua', 60, '2006-02-15 04:45:25'),
17 (5, 'Adana', 97, '2006-02-15 04:45:25'),
18 (6, 'Aden', 31, '2006-02-15 04:45:25'),
19 (7, 'Aden', 107, '2006-02-15 04:45:25'),
20 (8, 'Adoni', 44, '2006-02-15 04:45:25'),
21 (9, 'Ahmednagar', 44, '2006-02-15 04:45:25'),
22 (10, 'Akishima', 50, '2006-02-15 04:45:25'),
23 (11, 'Akron', 103, '2006-02-15 04:45:25'),
24 (12, 'Al-Madina', 103, '2006-02-15 04:45:25'),
25 (13, 'Al-Nasiriyah', 81, '2006-02-15 04:45:25'),
26 (14, 'al-Hananeh', 11, '2006-02-15 04:45:25'),
27 (15, 'al-Qudairif', 89, '2006-02-15 04:45:25'),
28 (16, 'al-Udhri...', 82, '2006-02-15 04:45:25').

```

Figure 8: Creation and Insertion of table "City"

```

1 CREATE TABLE `country` (
2   `country_id` int(3) NOT NULL,
3   `country` varchar(36) DEFAULT NULL,
4   `last_update` datetime DEFAULT NULL
5 ) ENGINE=InnoDB DEFAULT CHARSET=utf8;
6
7 --
8 -- Dumping data for table `country`
9 --
10
11 INSERT INTO `country` (`country_id`, `country`, `last_update`) VALUES
12 (1, 'Afghanistan', '2006-02-15 04:44:00'),
13 (2, 'Algeria', '2006-02-15 04:44:00'),
14 (3, 'American Samoa', '2006-02-15 04:44:00'),
15 (4, 'Angola', '2006-02-15 04:44:00'),
16 (5, 'Anguilla', '2006-02-15 04:44:00'),
17 (6, 'Argentina', '2006-02-15 04:44:00'),
18 (7, 'Armenia', '2006-02-15 04:44:00'),
19 (8, 'Australia', '2006-02-15 04:44:00'),
20 (9, 'Austria', '2006-02-15 04:44:00'),
21 (10, 'Azerbaijan', '2006-02-15 04:44:00'),
22 (11, 'Bahrain', '2006-02-15 04:44:00'),
23 (12, 'Barbados', '2006-02-15 04:44:00'),
24 (13, 'Belarus', '2006-02-15 04:44:00'),
25 (14, 'Bolivia', '2006-02-15 04:44:00'),
26 (15, 'Brazil', '2006-02-15 04:44:00'),
27 (16, 'Brunel', '2006-02-15 04:44:00'),

```

Figure 9: Creation and Insertion of table "Country"

```

1: CREATE TABLE `customer` (
2:   `customer_id` int(3) NOT NULL,
3:   `store_id` int(1) DEFAULT NULL,
4:   `first_name` varchar(11) DEFAULT NULL,
5:   `last_name` varchar(12) DEFAULT NULL,
6:   `email` varchar(64) DEFAULT NULL,
7:   `address_id` int(3) DEFAULT NULL,
8:   `active` int(1) DEFAULT NULL,
9:   `create_date` datetime DEFAULT NULL,
10:  `last_update` datetime DEFAULT NULL,
11 ) ENGINE=InnoDB DEFAULT CHARSET=utf8;
12
13 /**
14  * Dumping data for table "customer"
15 */
16
17 INSERT INTO `customer` (`customer_id`, `store_id`, `first_name`, `last_name`, `email`, `address_id`, `active`, `create_date`, `last_update`) VALUES
18 (1, 1, 'MARY', 'SMITH', 'MARY.SMITH@akilacustomer.org', 5, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
19 (2, 1, 'PATRICIA', 'JOHNSON', 'PATRICIA.JOHNSON@akilacustomer.org', 6, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
20 (3, 1, 'MICHAEL', 'WILSON', 'MICHAEL.WILSON@akilacustomer.org', 7, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
21 (4, 2, 'BARBARA', 'JONES', 'BARBARA.JONES@akilacustomer.org', 8, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
22 (5, 1, 'ELIZABETH', 'BROWN', 'ELIZABETH.BROWN@akilacustomer.org', 9, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
23 (6, 2, 'JENNIFER', 'DAVIS', 'JENNIFER.DAVIS@akilacustomer.org', 10, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
24 (7, 1, 'MARIA', 'MILLER', 'MARIA.MILLER@akilacustomer.org', 11, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
25 (8, 2, 'SUSAN', 'WILSON', 'SUSAN.WILSON@akilacustomer.org', 12, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
26 (9, 2, 'MARGARET', 'MOORE', 'MARGARET.MOORE@akilacustomer.org', 13, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
27 (10, 1, 'DOROTHY', 'TAYLOR', 'DOROTHY.TAYLOR@akilacustomer.org', 14, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
28 (11, 2, 'TARA', 'ANDREWS', 'TARA.ANDREWS@akilacustomer.org', 15, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20').

```

Figure 10: Creation and Insertion of table "Customer"

Note that the original_language_id column's datatype is converted to an `int` later due to foreign key changes after normalization.

```

1: CREATE TABLE `film` (
2:   `film_id` int(4) NOT NULL,
3:   `title` varchar(27) DEFAULT NULL,
4:   `description` text,
5:   `release_year` int(4) DEFAULT NULL,
6:   `language_id` int(1) DEFAULT NULL,
7:   `original_language_id` varchar(10) DEFAULT NULL,
8:   `rental_duration` int(1) DEFAULT NULL,
9:   `rental_rate` decimal(5,2) DEFAULT NULL,
10:  `length` int(3) DEFAULT NULL,
11:  `replacement_cost` decimal(5,2) DEFAULT NULL,
12:  `rating` varchar(5) DEFAULT NULL,
13:  `special_features` varchar(54) DEFAULT NULL,
14:  `last_update` datetime DEFAULT NULL,
15 ) ENGINE=InnoDB DEFAULT CHARSET=utf8;
16
17 /**
18  * Dumping data for table "film"
19 */
20
21 INSERT INTO `film` (`film_id`, `title`, `description`, `release_year`, `language_id`, `original_language_id`, `rental_duration`, `rental_rate`, `length`, `replacement_cost`, `rating`, `special_features`, `last_update`) VALUES
22 (1, 'ACADEMY AWARD WINNING Epic Fantasy About A Mad Scientist who must Battle a Teacher in The Canadian Rockies', 2006, 1, '1', 6, '0.99', 86, '20.99', 'PG', 'Deleted Scenes,Behind the scenes', '2006-02-15 05:03:42'),
23 (2, 'ACE GOLDFINGER', 'A Astounding Espionage of a Database Administrator And a Explorer who must Find a Car in Ancient China', 2006, 1, '1', 3, '4.99', 48, '12.99', 'G', 'Trailers,Deleted Scenes', '2006-02-15 05:03:42'),
24 (3, 'ADAPTATION HOLES', 'A Astounding Reflection of a Lumberjack And a Car who must Sink a Lumberjack In A Baloon Factory', 2006, 1, '1', 3, '2.99', 50, '18.99', 'NC-17', 'Deleted Scenes', '2006-02-15 05:03:42').

```

Figure 11: Creation and Insertion of table "Film"

```

1: CREATE TABLE `film_actor` (
2:   `actor_id` int(3) DEFAULT NULL,
3:   `film_id` int(4) DEFAULT NULL,
4:   `last_update` datetime DEFAULT NULL,
5 ) ENGINE=InnoDB DEFAULT CHARSET=utf8;
6
7 /**
8  * Dumping data for table "film_actor"
9 */
10
11 INSERT INTO `film_actor` (`actor_id`, `film_id`, `last_update`) VALUES
12 (1, 1, '2006-02-15 05:05:03'),
13 (1, 23, '2006-02-15 05:05:03'),
14 (1, 25, '2006-02-15 05:05:03'),
15 (1, 166, '2006-02-15 05:05:03'),
16 (1, 166, '2006-02-15 05:05:03'),
17 (1, 166, '2006-02-15 05:05:03'),
18 (1, 277, '2006-02-15 05:05:03'),
19 (1, 361, '2006-02-15 05:05:03'),
20 (1, 438, '2006-02-15 05:05:03'),
21 (1, 499, '2006-02-15 05:05:03'),
22 (1, 509, '2006-02-15 05:05:03'),
23 (1, 509, '2006-02-15 05:05:03'),
24 (1, 605, '2006-02-15 05:05:03'),
25 (1, 635, '2006-02-15 05:05:03'),
26 (1, 749, '2006-02-15 05:05:03'),
27 (1, 832, '2006-02-15 05:05:03'),
28 (1, 919, '2006-02-15 05:05:03').

```

Figure 12: Creation and Insertion of table "Film_Actor"

```

1 CREATE TABLE `film_category` (
2   `film_id` int(4) DEFAULT NULL,
3   `category_id` int(2) DEFAULT NULL,
4   `last_update` datetime DEFAULT NULL
5 ) ENGINE=InnoDB DEFAULT CHARSET=utf8;
6
7 --
8 -- Dumping data for table `film_category`
9 --
10
11 INSERT INTO `film_category`(`film_id`, `category_id`, `last_update`) VALUES
12 (1, 6, '2006-02-15 05:07:09'),
13 (2, 11, '2006-02-15 05:07:09'),
14 (3, 1, '2006-02-15 05:07:09'),
15 (4, 11, '2006-02-15 05:07:09'),
16 (5, 8, '2006-02-15 05:07:09'),
17 (6, 9, '2006-02-15 05:07:09'),
18 (7, 5, '2006-02-15 05:07:09'),
19 (8, 11, '2006-02-15 05:07:09'),
20 (9, 1, '2006-02-15 05:07:09'),
21 (10, 15, '2006-02-15 05:07:09'),
22 (11, 9, '2006-02-15 05:07:09'),
23 (12, 12, '2006-02-15 05:07:09'),
24 (13, 11, '2006-02-15 05:07:09'),
25 (14, 4, '2006-02-15 05:07:09'),
26 (15, 9, '2006-02-15 05:07:09'),
27 (16, 9, '2006-02-15 05:07:09'),
28 (17, 12, '2006-02-15 05:07:09'),

```

Figure 13: Creation and Insertion of table "Film_Category"

```

1 CREATE TABLE `film_text` (
2   `film_id` int(4) DEFAULT NULL,
3   `title` varchar(27) DEFAULT NULL,
4   `description` varchar(130) DEFAULT NULL
5 ) ENGINE=InnoDB DEFAULT CHARSET=utf8;
6
7 --
8 -- Dumping data for table `film_text`
9 --
10
11 INSERT INTO `film_text`(`film_id`, `title`, `description`) VALUES
12 (1, 'ACADEMY DINOSAUR', 'A Epic Drama of a Feminist And a Mad Scientist who must Battle a Teacher in The Canadian Rockies'),
13 (2, 'ACE GOLDFINGER', 'An Astounding Epistle of a Database Administrator And a Explorer who must Find a Car in Ancient China'),
14 (3, 'ADAPTATION HOLES', 'An Astounding Reflection of a Lumberjack And a Car who must Sink a Lumberjack in A Balloon Factory'),
15 (4, 'AFFAIR PREJUDICE', 'A Fanciful Documentary of a Fribee And a Lumberjack who must Chase a Monkey in A Shark Tank'),
16 (5, 'AFRICAN EGG', 'A Fast-Paced Documentary of a Pastry Chef And a Dentist who must Pursue a Forensic Psychologist in The Gulf of Mexico'),
17 (6, 'ALASKA PHANTOM', 'A Fast-Paced Documentary of a Dentist And a Dog who must Confront a Pioneer in Ancient China'),
18 (7, 'AIRPLANE SIERRA', 'A Touching Saga of a Hunter And a Butler who must Discover a Butler in A Jet Boat'),
19 (8, 'AIRPORT POLLOCK', 'A Epic Tale of a Moose And a Girl who must Confront a Monkey in Ancient India'),
20 (9, 'ALABAMA DEVIL', 'A Thoughtful Panorama of a Database Administrator And a Mad Scientist who must Outgun a Mad Scientist in A Jet Boat'),
21 (10, 'ALADDIN CALENDAR', 'A Action-Packed Tale of a Man And a Lumberjack who must Reach a Feminist in Ancient China'),
22 (11, 'ALAMO VIDEOTAPE', 'A Boring Epistle of a Butler And a Cat who must Fight a Pastry Chef in A MySQL Convention'),
23 (12, 'ALASKA PHANTOM', 'A Fanciful Saga of a Dentist And a Dog who must Confront a Pioneer in Australia'),
24 (13, 'ALICE FOOLISH', 'A Fast-Paced Documentary of a Dentist And a Cowgirl who must Battle a Hunter in The Canadian Rockies'),
25 (14, 'ALICE FANTASIA', 'A Emotional Drama of A Shark And a Database Administrator who must Vanquish a Pioneer in Soviet Georgia'),
26 (15, 'ALIEN CENTER', 'A Brilliant Drama of a Cat And a Mad Scientist who must Battle a Feminist in A MySQL Convention'),
27 (16, 'ALLEY EVOLUTION', 'A Fast-Paced Drama of a Robot And a Composer who must Battle a Astronaut in New Orleans'),
28 (17, 'ALONE TRIP', 'A Fast-Paced Character Study of a Connoisseur And a Nun who must Outrun a Wolf in An Abandoned Pen House').

```

Figure 14: Creation and Insertion of table "Film_Text"

```

1 CREATE TABLE `inventory` (
2   `inventory_id` int(4) NOT NULL,
3   `film_id` int(4) DEFAULT NULL,
4   `store_id` int(1) DEFAULT NULL,
5   `last_update` datetime DEFAULT NULL
6 ) ENGINE=InnoDB DEFAULT CHARSET=utf8;
7
8 --
9 -- Dumping data for table `inventory`
10 --
11
12 INSERT INTO `inventory`(`inventory_id`, `film_id`, `store_id`, `last_update`) VALUES
13 (1, 1, 1, '2006-02-15 05:09:17'),
14 (2, 1, 1, '2006-02-15 05:09:17'),
15 (3, 1, 1, '2006-02-15 05:09:17'),
16 (4, 1, 1, '2006-02-15 05:09:17'),
17 (5, 1, 1, '2006-02-15 05:09:17'),
18 (6, 1, 2, '2006-02-15 05:09:17'),
19 (7, 1, 2, '2006-02-15 05:09:17'),
20 (8, 1, 2, '2006-02-15 05:09:17'),
21 (9, 2, 3, '2006-02-15 05:09:17'),
22 (10, 2, 3, '2006-02-15 05:09:17'),
23 (11, 2, 2, '2006-02-15 05:09:17'),
24 (12, 3, 2, '2006-02-15 05:09:17'),
25 (13, 3, 2, '2006-02-15 05:09:17'),
26 (14, 3, 2, '2006-02-15 05:09:17'),
27 (15, 3, 2, '2006-02-15 05:09:17'),
28 (16, 2, 1, '2006-02-15 05:09:17'),

```

Figure 15: Creation and Insertion of table "Inventory"

```

1 CREATE TABLE `language` (
2   `language_id` int(10) NOT NULL,
3   `name` varchar(8) DEFAULT NULL,
4   `last_update` datetime DEFAULT NULL
5 ) ENGINE=InnoDB DEFAULT CHARSET=utf8;
6
7 --
8 -- Dumping data for table `language`
9 --
10
11 INSERT INTO `language` (`language_id`, `name`, `last_update`) VALUES
12 (1, 'English', '2006-02-15 05:02:19'),
13 (2, 'Italian', '2006-02-15 05:02:19'),
14 (3, 'Japanese', '2006-02-15 05:02:19'),
15 (4, 'Mandarin', '2006-02-15 05:02:19'),
16 (5, 'French', '2006-02-15 05:02:19'),
17 (6, 'German', '2006-02-15 05:02:19');

```

Figure 16: Creation and Insertion of table "Language"

```

1 CREATE TABLE `payment` (
2   `payment_id` int(5) NOT NULL,
3   `customer_id` int(3) DEFAULT NULL,
4   `staff_id` int(1) DEFAULT NULL,
5   `rental_id` int(5) DEFAULT NULL,
6   `amount` decimal(5,2) DEFAULT NULL,
7   `payment_date` datetime DEFAULT NULL,
8   `last_update` datetime DEFAULT NULL
9 ) ENGINE=InnoDB DEFAULT CHARSET=utf8;
10
11 --
12 -- Dumping data for table `payment`
13 --
14
15 INSERT INTO `payment` (`payment_id`, `customer_id`, `staff_id`, `rental_id`, `amount`, `payment_date`, `last_update`) VALUES
16 (1, 1, 1, 76, '2.99', '2005-05-25 11:30:37', '2006-02-15 22:12:30'),
17 (2, 1, 1, 573, '0.99', '2005-05-28 10:35:23', '2006-02-15 22:12:30'),
18 (3, 1, 1, 106, '5.99', '2005-05-28 10:35:23', '2006-02-15 22:12:30'),
19 (4, 1, 1, 142, '0.99', '2005-06-15 18:02:53', '2006-02-15 22:12:30'),
20 (5, 1, 2, 1474, '9.99', '2005-06-15 21:08:46', '2006-02-15 22:12:30'),
21 (6, 1, 1, 1725, '4.99', '2005-06-16 15:18:57', '2006-02-15 22:12:30'),
22 (7, 1, 1, 2308, '4.99', '2005-06-18 08:41:48', '2006-02-15 22:12:30'),
23 (8, 1, 2, 2363, '0.99', '2005-06-18 13:33:59', '2006-02-15 22:12:30'),
24 (9, 1, 1, 3284, '3.99', '2005-06-18 06:24:45', '2006-02-15 22:12:30'),
25 (10, 1, 1, 4606, '0.99', '2005-06-19 09:00:01', '2006-02-15 22:12:30'),
26 (11, 1, 1, 4611, '5.99', '2005-07-08 07:33:56', '2006-02-15 22:12:30'),
27 (12, 1, 1, 5244, '4.99', '2005-07-08 13:24:07', '2006-02-15 22:12:30'),
28 (13, 1, 1, 5376, '4.99', '2005-07-09 14:38:01', '2006-02-15 22:12:30'),

```

Figure 17: Creation and Insertion of table "Payment"

```

1 CREATE TABLE `rental` (
2   `rental_id` int(5) NOT NULL,
3   `rental_date` datetime DEFAULT NULL,
4   `inventory_id` int(5) DEFAULT NULL,
5   `customer_id` int(5) DEFAULT NULL,
6   `return_date` datetime DEFAULT NULL,
7   `staff_id` int(1) DEFAULT NULL,
8   `last_update` datetime DEFAULT NULL
9 ) ENGINE=InnoDB DEFAULT CHARSET=utf8;
10
11 --
12 -- Dumping data for table `rental`
13 --
14
15 INSERT INTO `rental` (`rental_id`, `rental_date`, `inventory_id`, `customer_id`, `return_date`, `staff_id`, `last_update`) VALUES
16 (1, '2005-05-24 22:53:10', 367, 130, '2005-05-26 22:04:30', 1, '2006-02-15 21:30:53'),
17 (2, '2005-05-24 23:03:39', 368, 130, '2005-05-26 22:04:30', 1, '2006-02-15 21:30:53'),
18 (3, '2005-05-24 23:03:39', 1715, 409, '2005-06-01 22:12:39', 1, '2006-02-15 21:30:53'),
19 (4, '2005-05-24 23:04:41', 2457, 333, '2005-06-03 01:43:41', 2, '2006-02-15 21:30:53'),
20 (5, '2005-05-24 23:05:21', 2079, 222, '2005-06-02 04:33:21', 1, '2006-02-15 21:30:53'),
21 (6, '2005-05-24 23:08:07', 2792, 549, '2005-05-27 01:32:07', 1, '2006-02-15 21:30:53'),
22 (7, '2005-05-24 23:11:53', 3995, 265, '2005-05-29 20:34:53', 2, '2006-02-15 21:30:53'),
23 (8, '2005-05-24 23:11:53', 2346, 239, '2005-05-29 23:33:01', 2, '2006-02-15 21:30:53'),
24 (9, '2005-05-25 00:00:40', 1826, 309, '2005-05-29 23:46:40', 1, '2006-02-15 21:30:53'),
25 (10, '2005-05-25 00:02:21', 1824, 309, '2005-05-31 22:41:21', 2, '2006-02-15 21:30:53'),
26 (11, '2005-05-25 00:19:02', 4442, 142, '2005-06-02 20:56:02', 2, '2006-02-15 21:30:53'),
27 (12, '2005-05-25 00:19:27', 1584, 261, '2005-05-30 05:44:27', 2, '2006-02-15 21:30:53'),
... ----- ... ----- ... ----- ... ----- ... ----- ...

```

Figure 18: Creation and Insertion of table "Rental"

```

1 CREATE TABLE `staff` (
2   `staff_id` int(1) NOT NULL,
3   `first_name` varchar(4) DEFAULT NULL,
4   `last_name` varchar(8) DEFAULT NULL,
5   `address_id` int(1) DEFAULT NULL,
6   `picture` mediumblob DEFAULT NULL,
7   `email` varchar(28) DEFAULT NULL,
8   `store_id` int(1) DEFAULT NULL,
9   `active` tinyint(1) DEFAULT NULL,
10  `username` varchar(10) DEFAULT NULL,
11  `password` varchar(40) DEFAULT NULL,
12  `last_update` datetime DEFAULT NULL,
13  ENGINE=InnoDB DEFAULT CHARACTER SET utf8;
14
15 /**
16  * Dumping data for table `staff`
17 */
18
19
20 INSERT INTO `staff`(`staff_id`, `first_name`, `last_name`, `address_id`, `picture`, `email`, `store_id`, `active`, `username`, `password`, `last_update`) VALUES
21 (1, 'staff_id int(1)', 'NOT NULL', 'first_name varchar(4)', 'DEFAULT NULL', 'last_name varchar(8)', 'DEFAULT NULL', 'address_id int(1)', 'DEFAULT NULL', 'picture mediumblob', 'DEFAULT NULL', 'email varchar(28)', 'DEFAULT NULL', 'store_id int(1)', 'DEFAULT NULL', 'active tinyint(1)', 'DEFAULT NULL', 'username varchar(10)', 'DEFAULT NULL', 'password varchar(40)', 'DEFAULT NULL', 'last_update datetime', 'DEFAULT NULL', 'ENGINE=InnoDB DEFAULT CHARACTER SET utf8);
22
23 /**
24  * Dumping data for table `customer`
25 */
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```

Figure 19: Creation and Insertion of table "Staff"

```
1 CREATE TABLE `store` (
2   `store_id` int(1) NOT NULL,
3   `manager_staff_id` int(1) DEFAULT NULL,
4   `address_id` int(1) DEFAULT NULL,
5   `last_update` datetime DEFAULT NULL,
6 ) ENGINE=InnoDB DEFAULT CHARSET=utf8;
7
8 /**
9  * Dumping data for table `store`
10 */
11
12 INSERT INTO `store` (`store_id`, `manager_staff_id`, `address_id`, `last_update`) VALUES
13 (1, 1, 1, '2006-02-15 04:57:12'),
14 (2, 2, 2, '2006-02-15 04:57:12');
```

Figure 20: Creation and Insertion of table "Store"

2.3 Table Constraints (Foreign Keys)

```
1 -- Constraints for dumped tables
2 --
3 -- Constraints for table `address`
4 --
5 ALTER TABLE `address`
6 ADD CONSTRAINT `address_ibfk_1` FOREIGN KEY (`city_id`) REFERENCES `city` (`city_id`);
7 --
8 --
9 -- Constraints for table `city`
10 --
11 ALTER TABLE `city`
12 ADD CONSTRAINT `city_ibfk_1` FOREIGN KEY (`country_id`) REFERENCES `country` (`country_id`);
13 --
14 --
15 -- Constraints for table `customer`
16 --
17 ALTER TABLE `customer`
18 ADD CONSTRAINT `customer_ibfk_1` FOREIGN KEY (`store_id`) REFERENCES `store` (`store_id`);
19 ADD CONSTRAINT `customer_ibfk_2` FOREIGN KEY (`address_id`) REFERENCES `address` (`address_id`);
20 --
21 --
22 -- Constraints for table `film`
23 --
24 ALTER TABLE `film`
25 ADD CONSTRAINT `film_ibfk_1` FOREIGN KEY (`language_id`) REFERENCES `language` (`language_id`);
26 --
27 --
28 -- Constraints for table `film_actor`
29 --
30 ALTER TABLE `film_actor`
31 ADD CONSTRAINT `film_actor_ibfk_1` FOREIGN KEY (`actor_id`) REFERENCES `actor` (`actor_id`),
32 ADD CONSTRAINT `film_actor_ibfk_2` FOREIGN KEY (`film_id`) REFERENCES `film` (`film_id`);
33 --
34 --
35 -- Constraints for table `film_category`
36 --
37 ALTER TABLE `film_category`
38 ADD CONSTRAINT `film_category_ibfk_1` FOREIGN KEY (`film_id`) REFERENCES `film` (`film_id`),
39 ADD CONSTRAINT `film_category_ibfk_2` FOREIGN KEY (`category_id`) REFERENCES `category` (`category_id`);
40 --
41 --
42 -- Constraints for table `film_text`
43 --
44 ALTER TABLE `film_text`
45 ADD CONSTRAINT `film_text_ibfk_1` FOREIGN KEY (`film_id`) REFERENCES `film` (`film_id`);
46 --
47 -- Constraints for table `inventory`
48 --
49 ALTER TABLE `inventory`
50 ADD CONSTRAINT `inventory_ibfk_1` FOREIGN KEY (`film_id`) REFERENCES `film` (`film_id`),
51 ADD CONSTRAINT `inventory_ibfk_2` FOREIGN KEY (`store_id`) REFERENCES `store` (`store_id`);
52 --
53 --
54 -- Constraints for table `payment`
55 --
56 ALTER TABLE `payment`
57 ADD CONSTRAINT `payment_ibfk_1` FOREIGN KEY (`customer_id`) REFERENCES `customer` (`customer_id`),
58 ADD CONSTRAINT `payment_ibfk_2` FOREIGN KEY (`staff_id`) REFERENCES `staff` (`staff_id`),
59 ADD CONSTRAINT `payment_ibfk_3` FOREIGN KEY (`rental_id`) REFERENCES `rental` (`rental_id`);
60 --
61 --
62 --
63 -- Constraints for table `rental`
64 --
65 ALTER TABLE `rental`
66 ADD CONSTRAINT `rental_ibfk_1` FOREIGN KEY (`inventory_id`) REFERENCES `inventory` (`inventory_id`),
67 ADD CONSTRAINT `rental_ibfk_2` FOREIGN KEY (`customer_id`) REFERENCES `customer` (`customer_id`),
68 ADD CONSTRAINT `rental_ibfk_3` FOREIGN KEY (`staff_id`) REFERENCES `staff` (`staff_id`);
69 --
70 --
71 -- Constraints for table `staff`
72 --
73 ALTER TABLE `staff`
74 ADD CONSTRAINT `staff_ibfk_1` FOREIGN KEY (`address_id`) REFERENCES `address` (`address_id`),
75 ADD CONSTRAINT `staff_ibfk_2` FOREIGN KEY (`store_id`) REFERENCES `store` (`store_id`);
76 --
77 --
78 -- Constraints for table `store`
79 --
80 ALTER TABLE `store`
81 ADD CONSTRAINT `store_ibfk_1` FOREIGN KEY (`manager_staff_id`) REFERENCES `staff` (`staff_id`),
82 ADD CONSTRAINT `store_ibfk_2` FOREIGN KEY (`address_id`) REFERENCES `address` (`address_id`);
```

2.4 Table Indexes (Primary/Foreign Keys)

Amendment: original_language_id in the "Film" table is later linked to the "Language" table as a foreign key in the current database version after normalization.

```

1 -- Indexes for dumped tables
2 --
3 --
4 --
5 -- Indexes for table `actor`
6 --
7 ALTER TABLE `actor`
8   ADD PRIMARY KEY (`actor_id`);
9 --
10 --
11 -- Indexes for table `address`
12 --
13 ALTER TABLE `address`
14   ADD PRIMARY KEY (`address_id`),
15   ADD KEY `city_id` (`city_id`);
16 --
17 --
18 -- Indexes for table `category`
19 --
20 ALTER TABLE `category`
21   ADD PRIMARY KEY (`category_id`);
22 --
23 --
24 -- Indexes for table `city`
25 --
26 ALTER TABLE `city`
27   ADD PRIMARY KEY (`city_id`),
28   ADD KEY `country_id` (`country_id`);
29 --
30 --
31 -- Indexes for table `country`
32 --
33 ALTER TABLE `country`
34   ADD PRIMARY KEY (`country_id`);
35 --
36 --
37 -- Indexes for table `customer`
38 --
39 ALTER TABLE `customer`
40   ADD PRIMARY KEY (`customer_id`),
41   ADD KEY `store_id` (`store_id`),
42   ADD KEY `address_id` (`address_id`);
43 --
44 -- Indexes for table `film`
45 --
46 ALTER TABLE `film`
47   ADD PRIMARY KEY (`film_id`),
48   ADD KEY `language_id` (`language_id`);
49 --
50 --
51 -- Indexes for table `film_actor`
52 --
53 ALTER TABLE `film_actor`
54   ADD KEY `actor_id` (`actor_id`),
55   ADD KEY `film_id` (`film_id`);
56 --
57 --
58 -- Indexes for table `film_category`
59 --
60 ALTER TABLE `film_category`
61   ADD KEY `film_id` (`film_id`),
62   ADD KEY `category_id` (`category_id`);
63 --
64 --
65 -- Indexes for table `film_text`
66 --
67 ALTER TABLE `film_text`
68   ADD KEY `film_id` (`film_id`);
69 --
70 --
71 -- Indexes for table `inventory`
72 --
73 ALTER TABLE `inventory`
74   ADD PRIMARY KEY (`inventory_id`),
75   ADD KEY `film_id` (`film_id`),
76   ADD KEY `store_id` (`store_id`);
77 --
78 --
79 -- Indexes for table `language`
80 --
81 ALTER TABLE `language`
82   ADD PRIMARY KEY (`language_id`);
83 --
84 --
85 -- Indexes for table `payment`
86 --
87 ALTER TABLE `payment`
88   ADD PRIMARY KEY (`payment_id`),
89   ADD KEY `customer_id` (`customer_id`),
90   ADD KEY `staff_id` (`staff_id`),
91   ADD KEY `rental_id` (`rental_id`);
92 --
93 --
94 --
95 -- Indexes for table `rental`
96 --
97 ALTER TABLE `rental`
98   ADD PRIMARY KEY `rental_id`,
99   ADD KEY `inventory_id` (`inventory_id`),
100  ADD KEY `customer_id` (`customer_id`),
101  ADD KEY `staff_id` (`staff_id`);
102 --
103 --
104 -- Indexes for table `staff`
105 --
106 ALTER TABLE `staff`
107   ADD PRIMARY KEY (`staff_id`),
108   ADD KEY `address_id` (`address_id`),
109   ADD KEY `store_id` (`store_id`);
110 --
111 --
112 -- Indexes for table `store`
113 --
114 ALTER TABLE `store`
115   ADD PRIMARY KEY (`store_id`),
116   ADD KEY `manager_staff_id` (`manager_staff_id`),
117   ADD KEY `address_id` (`address_id`);

```

2.5 Table Structures

Table structure

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	actor_id	int(3)	utf8_general_ci		No	None			Change Drop More
2	first_name	varchar(11)	utf8_general_ci		Yes	NULL			Change Drop More
3	last_name	varchar(12)	utf8_general_ci		Yes	NULL			Change Drop More
4	last_update	datetime			Yes	NULL			Change Drop More

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	actor_id	200	A	No	

Figure 21: Structure of table "Actor"

Table structure

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	address_id	int(3)	utf8_general_ci		No	None			Change Drop More
2	address	varchar(38)	utf8_general_ci		Yes	NULL			Change Drop More
3	address2	varchar(10)	utf8_general_ci		Yes	NULL			Change Drop More
4	district	varchar(20)	utf8_general_ci		Yes	NULL			Change Drop More
5	city_id	int(3)			Yes	NULL			Change Drop More
6	postal_code	mediumint(5)			Yes	NULL			Change Drop More
7	phone	bigint(12)			Yes	NULL			Change Drop More
8	last_update	datetime			Yes	NULL			Change Drop More

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	address_id	603	A	No	
Edit Drop	city_id	BTREE	No	No	city_id	603	A	Yes	

Figure 22: Structure of table "Address"

Table structure Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	category_id	int(2)			No	None			Change Drop More
2	name	varchar(11)	utf8_general_ci		Yes	NULL			Change Drop More
3	last_update	datetime			Yes	NULL			Change Drop More

Check all With selected: Browse Change Drop Primary Unique Index Fulltext
 Add to central columns Remove from central columns

Print Propose table structure Track table Move columns Normalize
 Add 1 column(s) after last_update Go

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	category_id	16	A	No	

Figure 23: Structure of table "Category"

Table structure Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	city_id	int(3)			No	None			Change Drop More
2	city	varchar(26)	utf8_general_ci		Yes	NULL			Change Drop More
3	country_id	int(3)			Yes	NULL			Change Drop More
4	last_update	datetime			Yes	NULL			Change Drop More

Check all With selected: Browse Change Drop Primary Unique Index Fulltext
 Add to central columns Remove from central columns

Print Propose table structure Track table Move columns Normalize
 Add 1 column(s) after last_update Go

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	city_id	600	A	No	
Edit Drop	country_id	BTREE	No	No	country_id	300	A	Yes	

Figure 24: Structure of table "City"

Table structure Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	country_id	int(3)			No	None			Change Drop More
2	country	varchar(36)	utf8_general_ci		Yes	NULL			Change Drop More
3	last_update	datetime			Yes	NULL			Change Drop More

With selected: Primary

Add 1 column(s) after last_update

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Drop	PRIMARY	BTREE	Yes	No	country_id	109	A	No	

Figure 25: Structure of table "Country"

Table structure Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	customer_id	int(3)			No	None			Change Drop More
2	store_id	int(1)			Yes	NULL			Change Drop More
3	first_name	varchar(11)	utf8_general_ci		Yes	NULL			Change Drop More
4	last_name	varchar(12)	utf8_general_ci		Yes	NULL			Change Drop More
5	email	varchar(40)	utf8_general_ci		Yes	NULL			Change Drop More
6	address_id	int(3)			Yes	NULL			Change Drop More
7	active	int(1)			Yes	NULL			Change Drop More
8	create_date	datetime			Yes	NULL			Change Drop More
9	last_update	datetime			Yes	NULL			Change Drop More

With selected: Primary

Add 1 column(s) after last_update

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Drop	PRIMARY	BTREE	Yes	No	customer_id	599	A	No	
Drop	store_id	BTREE	No	No	store_id	4	A	Yes	
Drop	address_id	BTREE	No	No	address_id	599	A	Yes	

Figure 26: Structure of table "Customer"

Table structure Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	actor_id	int(3)			Yes	NULL			Change Drop More
2	film_id	int(4)			Yes	NULL			Change Drop More
3	last_update	datetime			Yes	NULL			Change Drop More

Up ▲ Check all With selected: Browse Change Drop Primary Unique Index Fulltext
 Add to central columns

Print Propose table structure Track table Move columns Normalize

Add 1 column(s) after last_update

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	actor_id	BTREE	No	No	actor_id	420	A	Yes	
Edit Drop	film_id	BTREE	No	No	film_id	2731	A	Yes	

Figure 27: Structure of table "Film_Actor"

Table structure Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	film_id	int(4)			Yes	NULL			Change Drop More
2	category_id	int(2)			Yes	NULL			Change Drop More
3	last_update	datetime			Yes	NULL			Change Drop More

Up ▲ Check all With selected: Browse Change Drop Primary Unique Index Fulltext
 Add to central columns

Print Propose table structure Track table Move columns Normalize

Add 1 column(s) after last_update

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	film_id	BTREE	No	No	film_id	1000	A	Yes	
Edit Drop	category_id	BTREE	No	No	category_id	32	A	Yes	

Figure 28: Structure of table "Film_Category"

Amendment: The original.language.id field is represented as an **int** in the latest iteration of the database.

Table structure

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	film_id	int(4)			No	None			Change Drop More
2	title	varchar(27)	utf8_general_ci		Yes	NULL			Change Drop More
3	description	varchar(130)	utf8_general_ci		Yes	NULL			Change Drop More
4	release_year	int(4)			Yes	NULL			Change Drop More
5	language_id	int(1)			Yes	NULL			Change Drop More
6	original_language_id	varchar(10)	utf8_general_ci		Yes	NULL			Change Drop More
7	rental_duration	int(1)			Yes	NULL			Change Drop More
8	rental_rate	decimal(3,2)			Yes	NULL			Change Drop More
9	length	int(3)			Yes	NULL			Change Drop More
10	replacement_cost	decimal(4,2)			Yes	NULL			Change Drop More
11	rating	varchar(5)	utf8_general_ci		Yes	NULL			Change Drop More
12	special_features	varchar(54)	utf8_general_ci		Yes	NULL			Change Drop More
13	last_update	datetime			Yes	NULL			Change Drop More

Check all With selected: Browse Change Drop Primary Unique Index Fulltext
 Add to central columns Remove from central columns

Print Propose table structure Track table Move columns Normalize
 Add column(s) after last_update Go

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	film_id	1000	A	No	
Edit Drop	language_id	BTREE	No	No	language_id	2	A	Yes	

Figure 29: Structure of table "Film"

Table structure

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	film_id	int(4)			Yes	NULL			Change Drop More
2	title	varchar(27)	utf8_general_ci		Yes	NULL			Change Drop More
3	description	varchar(130)	utf8_general_ci		Yes	NULL			Change Drop More

Check all With selected: Browse Change Drop Primary Unique Index Fulltext
 Add to central columns Remove from central columns

Print Propose table structure Track table Move columns Normalize
 Add column(s) after description Go

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	film_id	BTREE	No	No	film_id	1000	A	Yes	

Figure 30: Structure of table "Film_Text"

Table structure | Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	Inventory_Id	int(4)			No	None			Change Drop More
2	film_id	int(4)			Yes	NULL			Change Drop More
3	store_id	int(1)			Yes	NULL			Change Drop More
4	last_update	datetime			Yes	NULL			Change Drop More

Up ▲ Check all With selected: Browse Change Drop Primary Unique Index Fulltext
 Add to central columns

Print Propose table structure Track table Move columns Normalize
 Add 1 column(s) after last_update Go

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	inventory_id	4581	A	No	
Edit Drop	film_id	BTREE	No	No	film_id	2290	A	Yes	
Edit Drop	store_id	BTREE	No	No	store_id	4	A	Yes	

Figure 31: Structure of table "Inventory"

Table structure | Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	language_id	int(1)			No	None			Change Drop More
2	name	varchar(8)	utf8_general_ci		Yes	NULL			Change Drop More
3	last_update	datetime			Yes	NULL			Change Drop More

Up ▲ Check all With selected: Browse Change Drop Primary Unique Index Fulltext
 Add to central columns

Print Propose table structure Track table Move columns Normalize
 Add 1 column(s) after last_update Go

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	language_id	6	A	No	

Figure 32: Structure of table "Language"

Table structure Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	payment_id	int(5)			No	None		Change Drop ▾ More	
2	customer_id	int(3)			Yes	NULL		Change Drop ▾ More	
3	staff_id	int(1)			Yes	NULL		Change Drop ▾ More	
4	rental_id	int(5)			Yes	NULL		Change Drop ▾ More	
5	amount	decimal(4,2)			Yes	NULL		Change Drop ▾ More	
6	payment_date	datetime			Yes	NULL		Change Drop ▾ More	
7	last_update	datetime			Yes	NULL		Change Drop ▾ More	

↑ Check all With selected: Change Drop Primary Unique Index Fulltext

Print Propose table structure Track table Move columns Normalize

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	payment_id	16049	A	No	
Edit Drop	customer_id	BTREE	No	No	customer_id	1234	A	Yes	
Edit Drop	staff_id	BTREE	No	No	staff_id	4	A	Yes	
Edit Drop	rental_id	BTREE	No	No	rental_id	16049	A	Yes	

Figure 33: Structure of table "Payment"

Table structure Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	rental_id	int(5)			No	None		Change Drop ▾ More	
2	rental_date	datetime			Yes	NULL		Change Drop ▾ More	
3	inventory_id	int(4)			Yes	NULL		Change Drop ▾ More	
4	customer_id	int(3)			Yes	NULL		Change Drop ▾ More	
5	return_date	datetime			Yes	NULL		Change Drop ▾ More	
6	staff_id	int(1)			Yes	NULL		Change Drop ▾ More	
7	last_update	datetime			Yes	NULL		Change Drop ▾ More	

↑ Check all With selected: Change Drop Primary Unique Index Fulltext

Print Propose table structure Track table Move columns Normalize

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	rental_id	16044	A	No	
Edit Drop	inventory_id	BTREE	No	No	inventory_id	16044	A	Yes	
Edit Drop	customer_id	BTREE	No	No	customer_id	1234	A	Yes	
Edit Drop	staff_id	BTREE	No	No	staff_id	4	A	Yes	

Figure 34: Structure of table "Rental"

Table structure Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	staff_id	int(1)	utf8_general_ci		No	None			Change Drop More
2	first_name	varchar(4)	utf8_general_ci		Yes	NULL			Change Drop More
3	last_name	varchar(8)	utf8_general_ci		Yes	NULL			Change Drop More
4	address_id	int(1)	utf8_general_ci		Yes	NULL			Change Drop More
5	picture	mediumtext	utf8_general_ci		Yes	NULL			Change Drop More
6	email	varchar(28)	utf8_general_ci		Yes	NULL			Change Drop More
7	store_id	int(1)	utf8_general_ci		Yes	NULL			Change Drop More
8	active	int(1)	utf8_general_ci		Yes	NULL			Change Drop More
9	username	varchar(4)	utf8_general_ci		Yes	NULL			Change Drop More
10	password	varchar(40)	utf8_general_ci		Yes	NULL			Change Drop More
11	last_update	datetime	utf8_general_ci		Yes	NULL			Change Drop More

Check all With selected: Browse Change Drop Primary Unique Index Fulltext
 Add to central columns Remove from central columns

Print Propose table structure Track table Move columns Normalize
 Add 1 column(s) after last_update

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	staff_id	2	A	No	
Edit Drop	address_id	BTREE	No	No	address_id	2	A	Yes	
Edit Drop	store_id	BTREE	No	No	store_id	2	A	Yes	

Figure 35: Structure of table "Staff"

Table structure Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	store_id	int(1)	utf8_general_ci		No	None			Change Drop More
2	manager_staff_id	int(1)	utf8_general_ci		Yes	NULL			Change Drop More
3	address_id	int(1)	utf8_general_ci		Yes	NULL			Change Drop More
4	last_update	datetime	utf8_general_ci		Yes	NULL			Change Drop More

Check all With selected: Browse Change Drop Primary Unique Index Fulltext
 Add to central columns Remove from central columns

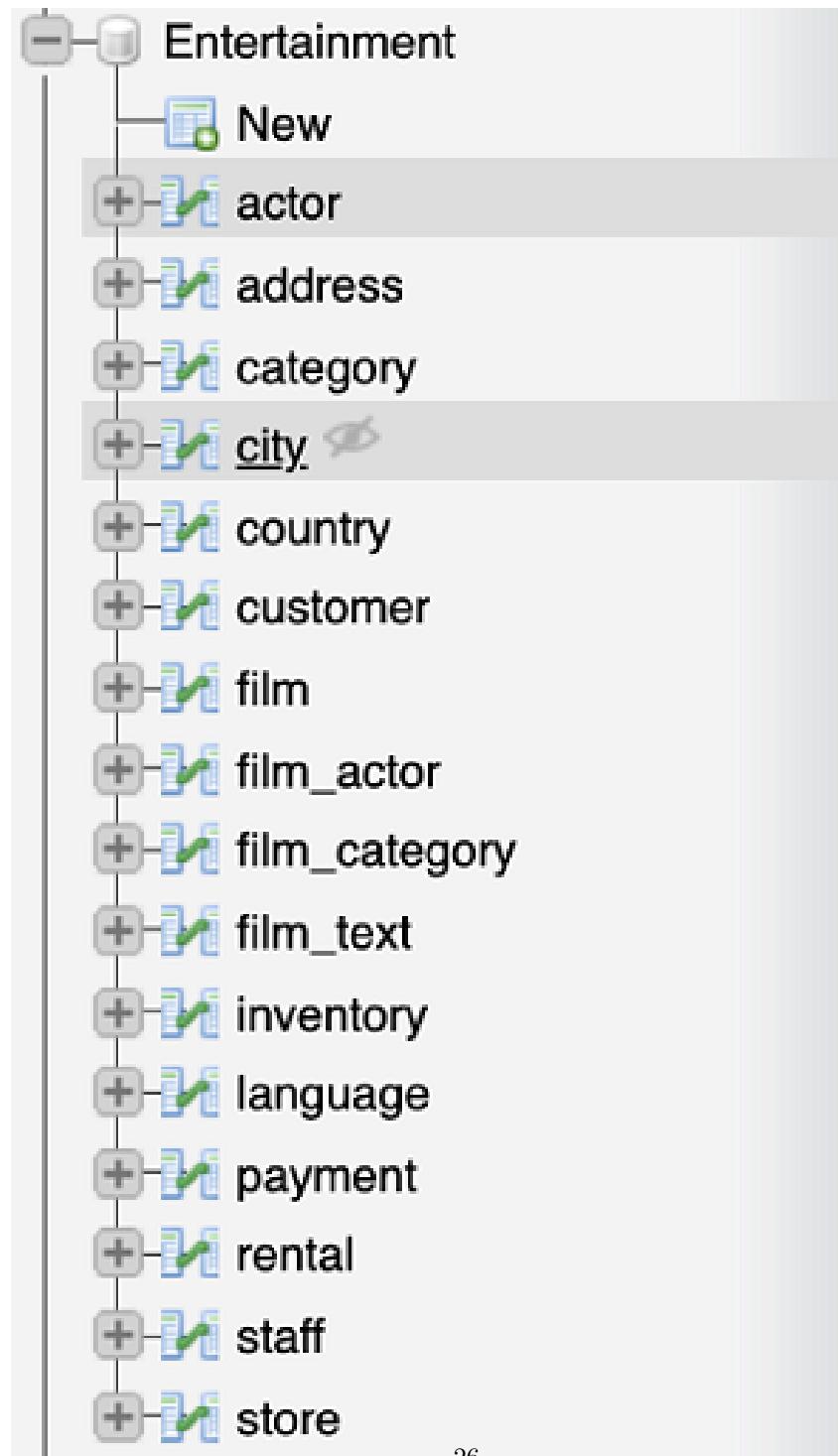
Print Propose table structure Track table Move columns Normalize
 Add 1 column(s) after last_update

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	store_id	2	A	No	
Edit Drop	manager_staff_id	BTREE	No	No	manager_staff_id	2	A	Yes	
Edit Drop	address_id	BTREE	No	No	address_id	2	A	Yes	

Figure 36: Structure of table "Store"

2.6 Final Results of Data Insertion & Selection



2.7 Overview on Tables of Database "Entertainment"

Table	Action	Rows	Type	Collation	Size	Overhead
actor		200	InnoDB	utf8_general_ci	16.0 Kib	-
address		603	InnoDB	utf8_general_ci	96.0 Kib	-
category		16	InnoDB	utf8_general_ci	16.0 Kib	-
city		600	InnoDB	utf8_general_ci	80.0 Kib	-
country		109	InnoDB	utf8_general_ci	16.0 Kib	-
customer		599	InnoDB	utf8_general_ci	128.0 Kib	-
film		1,000	InnoDB	utf8_general_ci	256.0 Kib	-
film_actor		5,462	InnoDB	utf8_general_ci	544.0 Kib	-
film_category		1,000	InnoDB	utf8_general_ci	176.0 Kib	-
film_text		1,000	InnoDB	utf8_general_ci	224.0 Kib	-
inventory		4,581	InnoDB	utf8_general_ci	416.0 Kib	-
language		6	InnoDB	utf8_general_ci	16.0 Kib	-
payment		16,049	InnoDB	utf8_general_ci	2.3 Mib	-
rental		16,044	InnoDB	utf8_general_ci	2.3 Mib	-
staff		2	InnoDB	utf8_general_ci	96.0 Kib	-
store		2	InnoDB	utf8_general_ci	48.0 Kib	-
16 tables	Sum	47,273	InnoDB	utf8mb4_general_ci	6.7 Mib	0 B

Figure 37: Summary of tables within the database.

2.7.1 Table Contents

Showing rows 0 - 24 (200 total, Query took 0.0009 seconds.) [actor_id: 1... - 25...]						
SELECT * FROM `actor` ORDER BY `actor_id` ASC						
<input type="checkbox"/> Profiling Edit inline Edit Explain SQL Create PHP code Refresh						
1	>	>>	Show all	Number of rows:	25	Filter rows: Search this table
Sort by key: PRIMARY (ASC)						
+ Options		↓	↑	actor_id	1	first_name last_name last_update
<input type="checkbox"/>	Edit	Copy	Delete	1	PENELOPE GUINNESS	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	2	NICK WAHLBERG	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	3	ED CHASE	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	4	JENNIFER DAVIS	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	5	JOHNNY LOLOBRIGIDA	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	6	BETTE NICHOLSON	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	7	GRACE MOSTEL	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	8	MATTHEW JOHANSSON	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	9	JOE SWANK	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	10	CHRISTIAN GABLE	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	11	ZERO CAGE	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	12	KARL BERRY	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	13	UMA WOOD	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	14	VIVIEN BERGEN	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	15	CUBA OLIVIER	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	16	FRED COSTNER	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	17	HELEN VOIGHT	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	18	DAN TORN	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	19	BOB FAWCETT	2006-02-15 04:34:33
<input type="checkbox"/>	Edit	Copy	Delete	20	LUCILLE TRACY	2006-02-15 04:34:33
Console

Figure 38: Sample content of the table "Actor".

Showing rows 0 - 24 (603 total, Query took 0.0007 seconds.)

SELECT * FROM `address`

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

	address_id	address	address2	district	city_id	postal_code	phone	last_update
<input type="checkbox"/>	1	47 MySakila Drive		Alberta	300	NULL	NULL	2014-09-25 22:30:27
<input type="checkbox"/>	2	28 MySQL Boulevard		QLD	576	NULL	NULL	2014-09-25 22:30:09
<input type="checkbox"/>	3	23 Workhaven Lane		Alberta	300	NULL	1403333568	2014-09-25 22:30:27
<input type="checkbox"/>	4	1411 Lillarydale Drive		QLD	576	NULL	6172235589	2014-09-25 22:30:09
<input type="checkbox"/>	5	1913 Hanoi Way		Nagasaki	463	35200	28303384290	2014-09-25 22:31:53
<input type="checkbox"/>	6	1121 Loja Avenue		California	449	17886	838635000000	2014-09-25 22:34:01
<input type="checkbox"/>	7	692 Joliet Street		Attika	38	83579	44847700000	2014-09-25 22:31:07
<input type="checkbox"/>	8	1566 Inegl Manor		Mandalay	349	53561	705814000000	2014-09-25 22:32:18
<input type="checkbox"/>	9	53 Idfu Parkway		Nantou	361	42399	10655648674	2014-09-25 22:33:16
<input type="checkbox"/>	10	1795 Santiago de Compostela Way		Texas	295	18743	860453000000	2014-09-25 22:33:55
<input type="checkbox"/>	11	900 Santiago de Compostela Parkway		Central Serbia	280	93896	716571000000	2014-09-25 22:34:11
<input type="checkbox"/>	12	478 Joliet Way		Hamilton	200	77948	657282000000	2014-09-25 22:32:22
<input type="checkbox"/>	13	613 Korolev Drive		Masqat	329	45844	380658000000	2014-09-25 22:32:29
<input type="checkbox"/>	14	1531 Sal Drive		Esfahan	162	53628	648857000000	2014-09-25 22:31:36
<input type="checkbox"/>	15	1542 Tarlac Parkway		Kanagawa	440	1027	635297000000	2014-09-25 22:31:53
<input type="checkbox"/>	16	808 Bhopal Manor		Haryana	582	10672	465588000000	2014-09-25 22:31:30
<input type="checkbox"/>	17	270 Amroha Parkway		Osmaniye	384	29610	695480000000	2014-09-25 22:33:27
<input type="checkbox"/>	18	770 Bydgoszcz Avenue		California	120	16266	517338000000	2014-09-25 22:33:47
<input type="checkbox"/>	19	419 Iligan Lane		Madhya Pradesh	76	72878	990911000000	2014-09-25 22:31:13
<input type="checkbox"/>	20	360 Toulouse Parkway		England	495	54308	949312000000	2014-09-25 22:33:40
<input checked="" type="checkbox"/>	21	270 Toulon Boulevard		Malaysia	166	61762	8777299999999999	2014-09-25 22:32:48

Figure 39: Sample content of the table "Address".

Showing rows 0 - 15 (16 total, Query took 0.0006 seconds.)

SELECT * FROM `category`

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

	category_id	name	last_update
<input type="checkbox"/>	1	Action	2006-02-15 04:46:27
<input type="checkbox"/>	2	Animation	2006-02-15 04:46:27
<input type="checkbox"/>	3	Children	2006-02-15 04:46:27
<input type="checkbox"/>	4	Classics	2006-02-15 04:46:27
<input type="checkbox"/>	5	Comedy	2006-02-15 04:46:27
<input type="checkbox"/>	6	Documentary	2006-02-15 04:46:27
<input type="checkbox"/>	7	Drama	2006-02-15 04:46:27
<input type="checkbox"/>	8	Family	2006-02-15 04:46:27
<input type="checkbox"/>	9	Foreign	2006-02-15 04:46:27
<input type="checkbox"/>	10	Games	2006-02-15 04:46:27
<input type="checkbox"/>	11	Horror	2006-02-15 04:46:27
<input type="checkbox"/>	12	Music	2006-02-15 04:46:27
<input type="checkbox"/>	13	New	2006-02-15 04:46:27
<input type="checkbox"/>	14	Sci-Fi	2006-02-15 04:46:27
<input type="checkbox"/>	15	Sports	2006-02-15 04:46:27
<input type="checkbox"/>	16	Travel	2006-02-15 04:46:27

Figure 40: Sample content of the table "Category".

Showing rows 0 - 24 (600 total, Query took 0.0005 seconds.)

`SELECT * FROM `city``

Profiling [Edit inline](#) [Edit](#) [Explain SQL](#) [Create PHP code](#) [Refresh](#)

	1	>	>>	Number of rows:	25	Filter rows:	Search this table	Sort by key:	None	▼	
+ Options											
+ T											
	city_id	city	country_id	last_update							
<input type="checkbox"/>	Edit	Copy	Delete	1	A Corua (La Corua)	87	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	2	Abha	82	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	3	Abu Dhabi	101	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	4	Acua	60	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	5	Adana	97	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	6	Addis Abeba	31	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	7	Aden	107	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	8	Adoni	44	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	9	Ahmadnagar	44	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	10	Akishima	50	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	11	Akron	103	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	12	al-Ayn	101	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	13	al-Hawiyah	82	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	14	al-Manama	11	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	15	al-Qadarif	89	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	16	al-Qatif	82	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	17	Alessandria	49	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	18	Alappuzha (Alleppey)	44	2006-02-15 04:45:25				
<input type="checkbox"/>	Edit	Copy	Delete	19	Allende	60	2006-02-15 04:45:25				

Figure 41: Sample content of the table "City".

Showing rows 0 - 24 (109 total, Query took 0.0005 seconds.)

[SELECT](#) * FROM `country`

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

		country_id	country	last_update
<input type="checkbox"/>	Edit Copy Delete	1	Afghanistan	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	2	Algeria	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	3	American Samoa	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	4	Angola	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	5	Anguilla	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	6	Argentina	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	7	Armenia	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	8	Australia	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	9	Austria	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	10	Azerbaijan	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	11	Bahrain	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	12	Bangladesh	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	13	Belarus	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	14	Bolivia	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	15	Brazil	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	16	Brunei	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	17	Bulgaria	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	18	Cambodia	2006-02-15 04:44:00
<input type="checkbox"/>	Edit Copy Delete	19	Cameroon	2006-02-15 04:44:00

Figure 42: Sample content of the table "Country".

Showing rows 0 - 24 (599 total, Query took 0.00006 seconds.)

SELECT * FROM `customer`

Profile | Edit inline | Edit | Explain SQL | Create PHP code | Refresh

	customer_id	store_id	first_name	last_name	email	address_id	active	create_date	last_update
<input type="checkbox"/>	1	1	MARY	SMITH	MARY.SMITH@sakilacustomer.org	5	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	2	1	PATRICIA	JOHNSON	PATRICIA.JOHNSON@sakilacustomer.org	6	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	3	1	LINDA	WILLIAMS	LINDA.WILLIAMS@sakilacustomer.org	7	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	4	2	BARBARA	JONES	BARBARA.JONES@sakilacustomer.org	8	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	5	1	ELIZABETH	BROWN	ELIZABETH.BROWN@sakilacustomer.org	9	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	6	2	JENNIFER	DAVIS	JENNIFER.DAVIS@sakilacustomer.org	10	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	7	1	MARIA	MILLER	MARIA.MILLER@sakilacustomer.org	11	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	8	2	SUSAN	WILSON	SUSAN.WILSON@sakilacustomer.org	12	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	9	2	MARGARET	MOORE	MARGARET.MOORE@sakilacustomer.org	13	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	10	1	DOROTHY	TAYLOR	DOROTHY.TAYLOR@sakilacustomer.org	14	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	11	2	LISA	ANDERSON	LISA.ANDERSON@sakilacustomer.org	15	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	12	1	NANCY	THOMAS	NANCY.THOMAS@sakilacustomer.org	16	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	13	2	KAREN	JACKSON	KAREN.JACKSON@sakilacustomer.org	17	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	14	2	BETTY	WHITE	BETTY.WHITE@sakilacustomer.org	18	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	15	1	HELEN	HARRIS	HELEN.HARRIS@sakilacustomer.org	19	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	16	2	SANDRA	MARTIN	SANDRA.MARTIN@sakilacustomer.org	20	0	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	17	1	DONNA	THOMPSON	DONNA.THOMPSON@sakilacustomer.org	21	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	18	2	CAROL	GARCIA	CAROL.GARCIA@sakilacustomer.org	22	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	19	1	RUTH	MARTINEZ	RUTH.MARTINEZ@sakilacustomer.org	23	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	20	2	SHARON	ROBINSON	SHARON.ROBINSON@sakilacustomer.org	24	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	21	1	MICHELLE	CLARK	MICHELLE.CLARK@sakilacustomer.org	25	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	22	1	LAURA	RODRIGUEZ	LAURA.RODRIGUEZ@sakilacustomer.org	26	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	23	2	SARAH	LEWIS	SARAH.LEWIS@sakilacustomer.org	27	1	2006-02-14 22:04:36	2006-02-15 04:57:20
<input type="checkbox"/>	24	2	KIMBERLY	LEE	KIMBERLY.LEE@sakilacustomer.org	28	1	2006-02-14 22:04:36	2006-02-15 04:57:20

Figure 43: Sample content of the table "Customer".

Amendment: The content of original_language_id is NULL throughout in the table "Film" as of the current iteration.

Showing rows 0 - 24 (1000 total, Query took 0.00006 seconds.)

SELECT * FROM `film`

Profile | Edit inline | Edit | Explain SQL | Create PHP code | Refresh

	film_id	title	description	release_year	language_id	original_language_id	rental_duration	rental_rate	length	replacement_cost	rating	special_features	last_update
<input type="checkbox"/>	1	ACADEMY DINOSAUR	A Epic Drama of a Feminist And a Mad Scientist who...	2006	1		6	0.99	86	20.99	PG	Deleted Scores,Behind the Scores	2006-02-15 05:03:42
<input type="checkbox"/>	2	ACE GOLDFINGER	A Thrilling Epistle of a Database Administrator A...	2006	1		3	4.99	48	12.99	G	Trailers,Deleted Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	3	ADAPTATION HOLES	A Touching Reflection of a Lumberjack And a Car...	2006	1		7	2.99	50	18.99	NC-17	Trailers,Deleted Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	4	AFFAIR PREJUDICE	A Historical Documentary Of a Trifecta And a Lumberj...	2006	1		5	2.99	117	26.99	G	Commentaries,Behind the Scores	2006-02-15 05:03:42
<input type="checkbox"/>	5	AFRICAN EGG	A Fast-Paced Documentary Of a Pastry Chef And a Da...	2006	1		6	2.99	130	22.99	G	Deleted Scores	2006-02-15 05:03:42
<input type="checkbox"/>	6	AGENT TRUMAN	A Robot And a Boy who must...	2006	1		3	2.99	169	17.99	PG	Deleted Scores	2006-02-15 05:03:42
<input type="checkbox"/>	7	AIRPLANE SIERRA	A Touching Saga of a Hunter And a Butler who must...	2006	1		8	4.99	82	28.99	PG-13	Trailers,Deleted Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	8	AIRPORT POLLOCK	A True Talk of a Moose And a Girl who must Confront...	2006	1		6	4.99	54	15.99	R	Trailers	2006-02-15 05:03:42
<input type="checkbox"/>	9	ALABAMA DEVIL	A Thoughtful Panorama About a Nurse And a Computer Administrator ...	2006	1		3	2.99	114	21.99	PG-13	Trailers,Deleted Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	10	ALADDIN CALENDAR	A Action-Packed Tale of a Man And a Lumberjack	2006	1		6	4.99	63	24.99	NC-17	Trailers,Deleted Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	11	ALAMO VIDEOTAPE	A Boring Epistle of a Butler And a Cat With...	2006	1		6	0.99	126	16.99	G	Commentaries,Behind the Scores	2006-02-15 05:03:42
<input type="checkbox"/>	12	ALASKA PHANTOM	A Fanciful Saga of a Hunter And a Pastry Chef with a Action-Packed Drama of a Dentist And a Crocodile.	2006	1		6	0.99	136	22.99	PG	Commentaries,Deleted Scores	2006-02-15 05:03:42
<input type="checkbox"/>	13	ALI FOREVER	A Emotional Drama of A Hunter And a Database Admin...	2006	1		4	4.99	150	21.99	PG	Deleted Scores,Behind the Scores	2006-02-15 05:03:42
<input type="checkbox"/>	14	ALICE FANTASIA	A Brilliant Drama of a Cat And a Man Of Goodwill	2006	1		6	0.99	94	23.99	NC-17	Trailers,Deleted Scores,Behind the Scores	2006-02-15 05:03:42
<input type="checkbox"/>	15	AI ILM PENTED	A Brilliant Drama of a Cat And a Man Of Goodwill	2006	1		6	0.99	44	11.99	NR,*17	Trailers,Commentaries,Behind the Scores	2006-02-15 05:03:42

Figure 44: Sample content of the table "Film".

Showing rows 0 - 24 (5462 total, Query took 0.0006 seconds.)

```
SELECT * FROM `film_actor`
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

	1	>	>>	Number of rows:	25	Filter rows:	Search this table	Sort by key:	None
+ Options									
	actor_id	film_id	last_update						
	1	1	2006-02-15 05:05:03						
	1	23	2006-02-15 05:05:03						
	1	25	2006-02-15 05:05:03						
	1	106	2006-02-15 05:05:03						
	1	140	2006-02-15 05:05:03						
	1	166	2006-02-15 05:05:03						
	1	277	2006-02-15 05:05:03						
	1	361	2006-02-15 05:05:03						
	1	438	2006-02-15 05:05:03						
	1	499	2006-02-15 05:05:03						
	1	506	2006-02-15 05:05:03						
	1	509	2006-02-15 05:05:03						
	1	605	2006-02-15 05:05:03						
	1	635	2006-02-15 05:05:03						
	1	749	2006-02-15 05:05:03						
	1	832	2006-02-15 05:05:03						
	1	939	2006-02-15 05:05:03						
	1	970	2006-02-15 05:05:03						
	1	980	2006-02-15 05:05:03						
	2	3	2006-02-15 05:05:03						
	2	31	2006-02-15 05:05:03						
	2	47	2006-02-15 05:05:03						
	2	105	2006-02-15 05:05:03						
	2	132	2006-02-15 05:05:03						
	2	145	2006-02-15 05:05:03						

Figure 45: Sample content of the table "Film_Actor".

Showing rows 0 - 24 (1000 total, Query took 0.0021 seconds.)

```
SELECT * FROM `film_category`
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

	1	>	>>	Number of rows:	25	Filter rows:	Search this table	Sort by key:	None
+ Options									
	film_id	category_id	last_update						
	1	6	2006-02-15 05:07:09						
	2	11	2006-02-15 05:07:09						
	3	6	2006-02-15 05:07:09						
	4	11	2006-02-15 05:07:09						
	5	8	2006-02-15 05:07:09						
	6	9	2006-02-15 05:07:09						
	7	5	2006-02-15 05:07:09						
	8	11	2006-02-15 05:07:09						
	9	11	2006-02-15 05:07:09						
	10	15	2006-02-15 05:07:09						
	11	9	2006-02-15 05:07:09						
	12	12	2006-02-15 05:07:09						
	13	11	2006-02-15 05:07:09						
	14	4	2006-02-15 05:07:09						
	15	9	2006-02-15 05:07:09						
	16	9	2006-02-15 05:07:09						
	17	12	2006-02-15 05:07:09						
	18	2	2006-02-15 05:07:09						
	19	1	2006-02-15 05:07:09						
	20	12	2006-02-15 05:07:09						
	21	1	2006-02-15 05:07:09						
	22	13	2006-02-15 05:07:09						
	23	2	2006-02-15 05:07:09						
	24	11	2006-02-15 05:07:09						
	25	13	2006-02-15 05:07:09						

Figure 46: Sample content of the table "Film_Category".

Showing rows 0 - 24 (1000 total, Query took 0.0007 seconds.)

```
SELECT * FROM `film_text`
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

	1	>	>>	Number of rows:	25	Filter rows:	Search this table	Sort by key:	None
+ Options									
film_id	title	description							
1	ACADEMY DINOSAUR	A Epic Drama of a Feminist And a Mad Scientist who...							
2	ACE GOLDFINGER	A Astounding Epistle of a Database Administrator A...							
3	ADAPTATION HOLES	A Astounding Reflection of a Lumberjack And a Car ...							
4	AFFAIR PREJUDICE	A Fanciful Documentary of a Frisbee And a Lumberja...							
5	AFRICAN EGG	A Fast-Paced Documentary of a Pastry Chef And a De...							
6	AGENT TRUMAN	A Intrepid Panorama of a Robot And a Boy who must ...							
7	AIRPLANE SIERRA	A Touching Saga of a Hunter And a Butler who must ...							
8	AIRPORT POLLOCK	A Epic Tale of a Moose And a Girl who must Confron...							
9	ALABAMA DEVIL	A Thoughtful Panorama of a Database Administrator ...							
10	ALADDIN CALENDAR	A Action-Packed Tale of a Man And a Lumberjack who...							
11	ALAMO VIDEOTAPE	A Boring Epistle of a Butler And a Cat who must Fl...							
12	ALASKA PHANTOM	A Fanciful Saga of a Hunter And a Pastry Chef who ...							
13	ALI FOREVER	A Action-Packed Drama of a Dentist And a Crocodile..							
14	ALICE FANTASIA	A Emotional Drama of a Shark And a Database Admi...							
15	ALIEN CENTER	A Brilliant Drama of a Cat And a Mad Scientist who...							
16	ALLEY EVOLUTION	A Fast-Paced Drama of a Robot And a Composer who m...							
17	ALONE TRIP	A Fast-Paced Character Study of a Composer And a D...							
18	ALTER VICTORY	A Thoughtful Drama of a Composer And a Feminist wh...							
19	AMADEUS HOLY	A Emotional Display of a Pioneer And a Technical W...							
20	AMELIE HELLFIGHTERS	A Boring Drama of a Woman And a Squirrel who must ...							
21	AMERICAN CIRCUS	A Insightful Drama of a Girl And a Astronaut who m...							
22	AMISTAD MIDSUMMER	A Emotional Character Study of a Dentist And a Cro...							
23	ANACONDA CONFESSIONS	A Lackluster Display of a Dentist And a Dentist w...							
24	ANALYZE HOOISERS	A Thoughtful Display of a Explorer And a Pastry Ch...							
25	ANGELS LIFE	A Thoughtful Display of a Woman And a Astronaut wh...							

Figure 47: Sample content of the table "Film_Text".

Showing rows 0 - 24 (4581 total, Query took 0.0015 seconds.)

```
SELECT * FROM `inventory`
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

	1	>	>>	Number of rows:	25	Filter rows:	Search this table	Sort by key:	None
+ Options									
		▼	▼	inventory_id	film_id	store_id	last_update		
<input type="checkbox"/>	Edit	Copy	Delete	1	1	1	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	2	1	1	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	3	1	1	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	4	1	1	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	5	1	2	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	6	1	2	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	7	1	2	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	8	1	2	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	9	2	2	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	10	2	2	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	11	2	2	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	12	3	2	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	13	3	2	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	14	3	2	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	15	3	2	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	16	4	1	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	17	4	1	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	18	4	1	2006-02-15 05:09:17		
<input type="checkbox"/>	Edit	Copy	Delete	19	4	1	2006-02-15 05:09:17		

Figure 48: Sample content of the table "Inventory".

Showing rows 0 - 5 (6 total, Query took 0.0007 seconds.)

[SELECT](#) * FROM `language`

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all | Number of rows: 25 ▾ Filter rows: Search this table Sort by key: None ▾

+ Options

	Edit	Copy	Delete	language_id	name	last_update
<input type="checkbox"/>	Edit	Copy	Delete	1	English	2006-02-15 05:02:19
<input type="checkbox"/>	Edit	Copy	Delete	2	Italian	2006-02-15 05:02:19
<input type="checkbox"/>	Edit	Copy	Delete	3	Japanese	2006-02-15 05:02:19
<input type="checkbox"/>	Edit	Copy	Delete	4	Mandarin	2006-02-15 05:02:19
<input type="checkbox"/>	Edit	Copy	Delete	5	French	2006-02-15 05:02:19
<input type="checkbox"/>	Edit	Copy	Delete	6	German	2006-02-15 05:02:19

Figure 49: Sample content of the table "Language".

Showing rows 0 - 24 (16049 total, Query took 0.0007 seconds.)

[SELECT](#) * FROM `payment`

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

	<_>	>_>	Number of rows:	25	Filter rows:	Search this table	Sort by key:	None		
+ Options										
			payment_id	customer_id	staff_id	rental_id	amount	payment_date	last_update	
<input type="checkbox"/>	Edit	Copy	Delete	1	1	1	76	2.99	2005-05-25 11:30:37	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	2	1	1	573	0.99	2005-05-28 10:35:23	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	3	1	1	1185	5.99	2005-06-15 00:54:12	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	4	1	2	1422	0.99	2005-06-15 18:02:53	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	5	1	2	1476	9.99	2005-06-15 21:08:46	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	6	1	1	1725	4.99	2005-06-16 15:18:57	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	7	1	1	2308	4.99	2005-06-18 08:41:48	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	8	1	2	2363	0.99	2005-06-18 13:33:59	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	9	1	1	3284	3.99	2005-06-21 06:24:45	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	10	1	2	4526	5.99	2005-07-08 03:17:05	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	11	1	1	4611	5.99	2005-07-08 07:33:35	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	12	1	1	5244	4.99	2005-07-09 13:24:07	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	13	1	1	5326	4.99	2005-07-09 16:58:01	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	14	1	1	6163	7.99	2005-07-11 10:13:46	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	15	1	2	7273	2.99	2005-07-27 11:31:22	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	16	1	1	7841	4.99	2005-07-28 09:04:45	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	17	1	2	8033	4.99	2005-07-28 16:18:23	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	18	1	1	8074	0.99	2005-07-28 17:33:39	2006-02-15 22:12:30
<input type="checkbox"/>	Edit	Copy	Delete	19	1	2	8116	0.99	2005-07-28 19:20:07	2006-02-15 22:12:30

Figure 50: Sample content of the table "Payment".

Showing rows 0 - 24 (16044 total, Query took 0.00009 seconds.)

[SELECT * FROM `rental`](#)

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

	Number of rows:	25	Filter rows:	Search this table	Sort by key:	None	
+ Options - T- ↗							
	rental_id	rental_date	inventory_id	customer_id	return_date	staff_id	last_update
<input type="checkbox"/>	1	2005-05-24 22:53:30	367	130	2005-05-26 22:04:30	1	2006-02-15 21:30:53
<input type="checkbox"/>	2	2005-05-24 22:54:33	1525	459	2005-05-28 19:40:33	1	2006-02-15 21:30:53
<input type="checkbox"/>	3	2005-05-24 23:03:39	1711	406	2005-06-01 22:12:39	1	2006-02-15 21:30:53
<input type="checkbox"/>	4	2005-05-24 23:04:41	2452	333	2005-06-03 01:43:41	2	2006-02-15 21:30:53
<input type="checkbox"/>	5	2005-05-24 23:05:21	2079	222	2005-06-02 04:33:21	1	2006-02-15 21:30:53
<input type="checkbox"/>	6	2005-05-24 23:08:07	2792	549	2005-05-27 01:32:07	1	2006-02-15 21:30:53
<input type="checkbox"/>	7	2005-05-24 23:11:53	3995	261	2005-05-29 20:34:53	2	2006-02-15 21:30:53
<input type="checkbox"/>	8	2005-05-24 23:31:46	2346	239	2005-05-27 23:33:46	2	2006-02-15 21:30:53
<input type="checkbox"/>	9	2005-05-25 00:00:40	2580	126	2005-05-28 00:22:40	1	2006-02-15 21:30:53
<input type="checkbox"/>	10	2005-05-25 00:02:21	1824	399	2005-05-31 22:44:21	2	2006-02-15 21:30:53
<input type="checkbox"/>	11	2005-05-25 00:09:02	4443	142	2005-06-02 20:56:02	2	2006-02-15 21:30:53
<input type="checkbox"/>	12	2005-05-25 00:19:27	1584	261	2005-05-30 05:44:27	2	2006-02-15 21:30:53
<input type="checkbox"/>	13	2005-05-25 00:22:55	2294	334	2005-05-30 04:28:55	1	2006-02-15 21:30:53
<input type="checkbox"/>	14	2005-05-25 00:31:15	2701	446	2005-05-26 02:56:15	1	2006-02-15 21:30:53
<input type="checkbox"/>	15	2005-05-25 00:39:22	3049	319	2005-06-03 03:30:22	1	2006-02-15 21:30:53
<input type="checkbox"/>	16	2005-05-25 00:43:11	389	316	2005-05-26 04:42:11	2	2006-02-15 21:30:53
<input type="checkbox"/>	17	2005-05-25 01:06:36	830	575	2005-05-27 00:43:36	1	2006-02-15 21:30:53
<input type="checkbox"/>	18	2005-05-25 01:10:47	3376	19	2005-05-31 06:35:47	2	2006-02-15 21:30:53
<input type="checkbox"/>	19	2005-05-25 01:17:24	1941	456	2005-05-31 06:00:24	1	2006-02-15 21:30:53

Figure 51: Sample content of the table "Rental".

Showing rows 0 - 1 (2 total, Query took 0.00008 seconds.)

SELECT * FROM staff											
<input type="checkbox"/>	Show all	Number of rows:	25	Filter rows:	Search this table	Sort by key:	None				
+ Options											
	at staff_id	first_name	last_name	address_id	picture	email	store_id	active	username	password	last_update
<input type="checkbox"/>	Edit	Copy	Delete	1	Mike Hillyer	3 7PNG	Mike.Hillyer@sakilastaff.com	1	1	Mike	8cb2237d0679ca8bd646eac0d0da96345513964 2006-02-15 03:57:16
<input type="checkbox"/>	Edit	Copy	Delete	2	Jon Stephens	4 IHDRy 727e pHys ? ...	Jon.Stephens@sakilastaff.com	2	1	Jon	2006-02-15 03:57:16

Figure 52: Sample content of the table "Staff".

Showing rows 0 - 1 (2 total, Query took 0.0008 seconds).

	store_id	manager_staff_id	address_id	last_update
<input type="checkbox"/>	1	1	1	2006-02-15 04:57:12
<input checked="" type="checkbox"/>	2	2	2	2006-02-15 04:57:12

Figure 53: Sample content of the table "Store".

2.8 Normalization

2.8.1 Entity Relation Diagram After Normalization

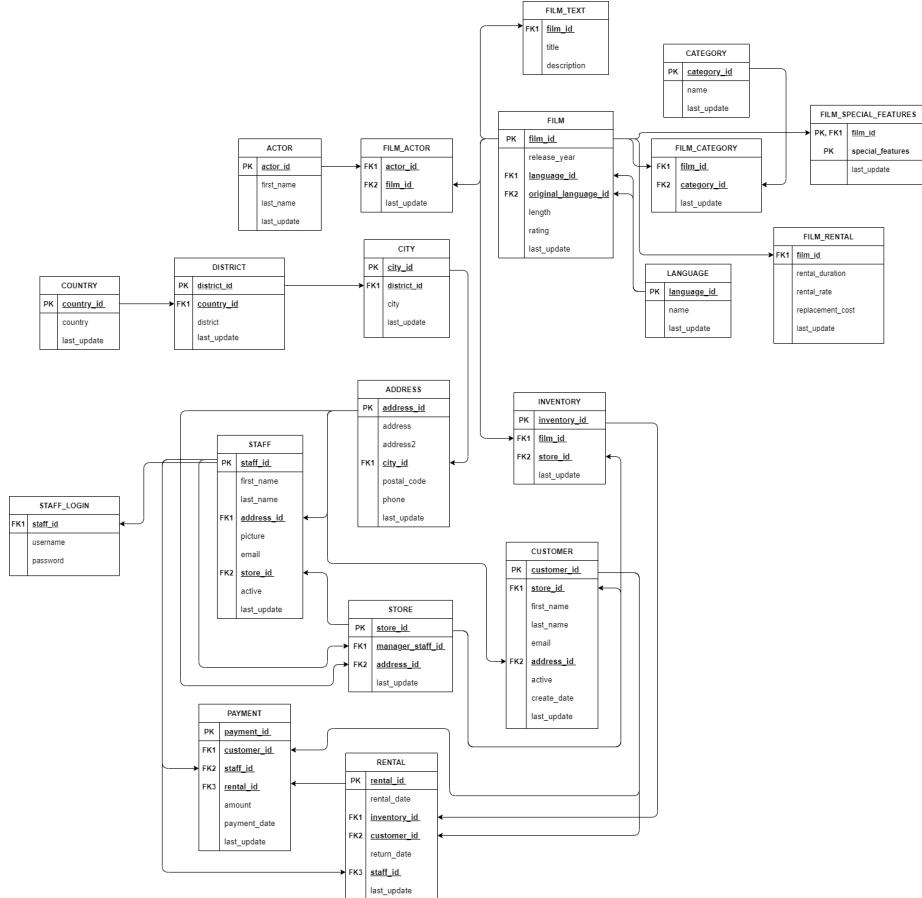


Figure 54: Database structure after normalization.

2.8.2 Tables Affected by Normalization

The tables **Film_Special_Features** is normalized from the **Film** table to preserve compliance with the First Normal Form.

Showing rows 0 - 24 (2115 total, Query took 0.0009 seconds.)

```
SELECT * FROM `film_special_features`
```

Number of rows: 25 Filter rows: Search this table

+ Options

	<input type="button" value="←"/>	<input type="button" value="→"/>		film_id	special_features	last_update
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	1	Behind The Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	1	Deleted Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	2	Deleted Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	2	Trailers	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	3	Deleted Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	3	Trailers	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	4	Behind The Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	4	Commentaries	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	5	Deleted Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	6	Deleted Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	7	Deleted Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	7	Trailers	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	8	Trailers	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	9	Deleted Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	9	Trailers	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	10	Deleted Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	10	Trailers	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	11	Behind The Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	11	Commentaries	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	12	Commentaries	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	12	Deleted Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	13	Behind The Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	13	Deleted Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	14	Behind The Scenes	2006-02-15 05:03:42
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	14	Deleted Scenes	2006-02-15 05:03:42

Figure 55: Table "Film_Special_Features", normalized.

The District, City and Address tables have been recompiled after normalization.

The field last_update is retained for the purpose of easing maintenance of the altered tables.

It can be noted that for the Address and City tables, many errors within the database have been uncovered due to the use of normalization that otherwise would have gone unnoticed. Errors found include:

- Cities with ID 121, 493 and 583 not having a listed district. Their district_id fields in the newly reorganized City table have been left blank.
- Entry with city_id 313 in the City table not existing within the address table. district_id field of this city also left blank in the City table.
- Multiple occurrences of the same city_id being in multiple districts in the address table. To preserve database integrity after normalization, one of the extra districts is removed with the use of an SQL command containing the GROUP BY keyword.

Showing rows 0 - 24 (384 total, Query took 0.0006 seconds.)

```
SELECT * FROM `district`
```

1 < > >> | Show all | Number of rows: 25 | Filter rows: Search this table

+ Options

	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	district_id	country_id	district	last_update
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	1	101	Abu Dhabi	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	2	45	Aceh	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	3	97	Adana	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	4	31	Addis Ababa	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	5	107	Aden	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	6	80	Adygea	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	7	98	Ahal	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	8	29	al-Daqahliya	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	9	11	al-Manama	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	10	89	al-Qadarif	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	11	29	al-Qalyubiya	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	12	29	al-Sharqiya	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	13	82	al-Sharqiya	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	14	20	Alberta	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	15	73	Alto Paran	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	16	44	Andhra Pradesh	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	17	38	Anhalt Sachsen	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	18	22	Antofagasta	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	19	104	Anzotegui	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	20	49	Apulia	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	21	77	Arecibo	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	22	82	Asir	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	23	44	Assam	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	24	87	Asturia	2021-04-15 23:20:20
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	25	73	Asuncin	2021-04-15 23:20:20

Figure 56: Table "District", normalized.

Showing rows 0 - 24 (603 total, Query took 0.0018 seconds.) [city_id: 1... - 25...]

```
SELECT * FROM `address` ORDER BY `city_id` ASC
```

Number of rows: 25 | Filter rows: Search this table | Sort by key: city_id (ASC)

+ Options

	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	address_id	address	address2	city_id	postal_code	phone	last_update
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	56	939 Probolinggo Loop		1	4166	680428000000	2014-09-25 22:33:08
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	105	733 Mandaluyong Place		2	77459	196568000000	2014-09-25 22:32:59
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	457	535 Ahmadnagar Manor		3	41136	985110000000	2014-09-25 22:33:34
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	491	1789 Saint-Denis Parkway		4	8268	936807000000	2014-09-25 22:32:01
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	332	663 Baha Blanca Parkway		5	33463	834419000000	2014-09-25 22:33:22
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	397	614 Pak Kret Street		6	27796	47808359842	2014-09-25 22:30:59
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	214	751 Lima Loop		7	99405	756460000000	2014-09-25 22:34:08
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	372	230 Urawa Drive		8	2738	166898000000	2014-09-25 22:31:09
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	302	922 Vila Velha Loop		9	4085	510737000000	2014-09-25 22:31:10
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	580	923 Tangail Boulevard		10	33384	315528000000	2014-09-25 22:31:45
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	484	98 Pyongyang Boulevard		11	88749	191958000000	2014-09-25 22:33:42
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	102	669 Firozabad Loop		12	92265	412903000000	2014-09-25 22:33:35
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	74	1124 Buenaventura Drive		13	6856	407734000000	2014-09-25 22:32:59
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	596	1759 Niznekamsk Avenue		14	39414	864393000000	2014-09-25 22:30:11
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	400	1152 Citrus Heights Manor		15	5239	765957000000	2014-09-25 22:33:11
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	422	289 Santo Andr Manor		16	72410	214976000000	2014-09-25 22:32:59
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	37	127 Purnea (Purnia) Manor		17	79388	911872000000	2014-09-25 22:31:42
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	179	431 Xiangtan Avenue		18	4854	230251000000	2014-09-25 22:31:10
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	419	397 Sunnyvale Avenue		19	55566	680852000000	2014-09-25 22:32:01
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	364	1623 Kingstown Drive		20	91299	296395000000	2014-09-25 22:30:04
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	557	1407 Pachuca de Soto Place		21	26284	380078000000	2014-09-25 22:30:14
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	229	1014 Loja Manor		22	66851	460796000000	2014-09-25 22:31:10
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	420	992 Klerksdorp Loop		23	33711	855290000000	2014-09-25 22:32:19
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	540	949 Allende Lane		24	67521	122981000000	2014-09-25 22:31:11
	<input type="checkbox"/>	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	312	1354 Siegen Street		25	80184	573442000000	2014-09-25 22:30:15

Figure 57: Table "Address", normalized.

Showing rows 0 - 24 (600 total, Query took 0.0006 seconds.)

```
SELECT * FROM `city`
```

1 > >> | Number of rows: 25 | Filter rows: Search this table

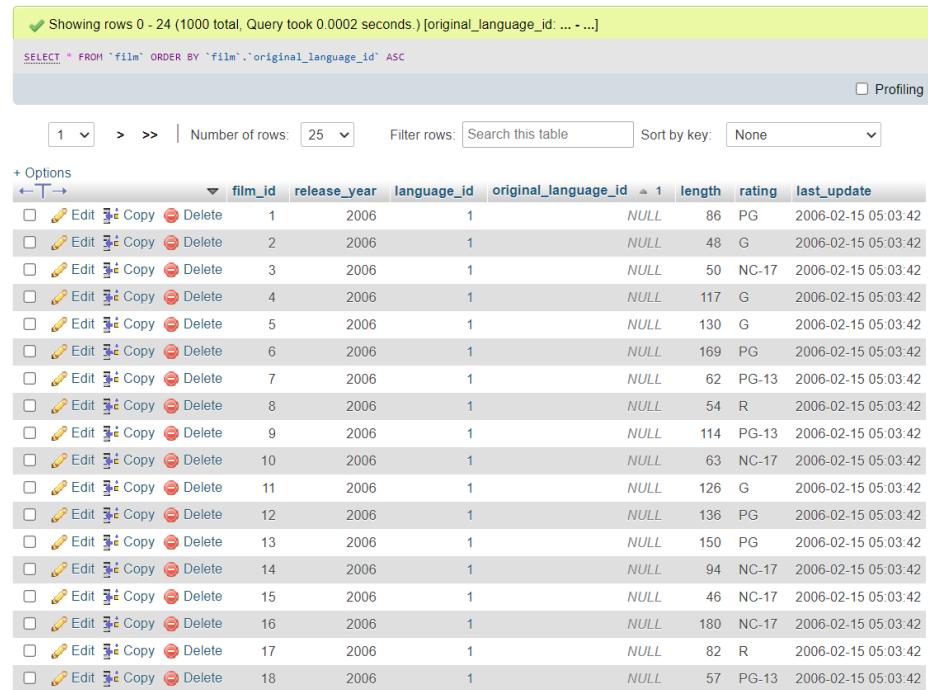
+ Options

	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	city_id	district_id	city	last_update
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	1	110	A Corua (La Corua)	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	2	22	Abha	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	3	1	Abu Dhabi	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	4	82	Acua	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	5	3	Adana	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	6	4	Addis Abeba	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	7	5	Aden	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	8	16	Adoni	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	9	198	Ahmadnagar	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	10	353	Akishima	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	11	250	Akron	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	12	1	al-Ayn	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	13	205	al-Hawiya	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	14	9	al-Manama	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	15	10	al-Qadarif	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	16	12	al-Qatif	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	17	267	Alessandria	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	18	166	Allappuzha (Alleppey)	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	19	118	Allende	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	20	50	Almirante Brown	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	21	285	Alvorada	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	22	344	Ambattur	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	23	360	Amersfoort	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	24	361	Amroha	2006-02-15 04:45:25
	<input type="checkbox"/>	<input type="checkbox"/>	Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	25	284	Angra dos Reis	2006-02-15 04:45:25

Figure 58: Table "City", normalized.

Note that **original_film.id** now has a foreign key relation with the Language

table to increase consistency. Its database has consequently been converted to **int**.



The screenshot shows a MySQL Workbench interface displaying the results of a query on the 'film' table. The results are shown in a grid format with the following columns: film_id, release_year, language_id, original_language_id, length, rating, and last_update. The data consists of 18 rows, each representing a film entry from 2006. The 'original_language_id' column is consistently set to 1. The 'length' column contains values such as 86, 48, 50, 117, 130, 169, 62, 54, 114, 63, 126, 136, 150, 94, 46, 180, 82, and 57. The 'rating' column includes entries like PG, G, NC-17, PG-13, R, and NC-17. The 'last_update' column shows dates from 2006-02-15 to 2006-02-15 at 05:03:42.

	<input type="checkbox"/> Edit	<input type="checkbox"/> Copy	<input type="checkbox"/> Delete	film_id	release_year	language_id	original_language_id	length	rating	last_update
<input type="checkbox"/>				1	2006	1	NULL	86	PG	2006-02-15 05:03:42
<input type="checkbox"/>				2	2006	1	NULL	48	G	2006-02-15 05:03:42
<input type="checkbox"/>				3	2006	1	NULL	50	NC-17	2006-02-15 05:03:42
<input type="checkbox"/>				4	2006	1	NULL	117	G	2006-02-15 05:03:42
<input type="checkbox"/>				5	2006	1	NULL	130	G	2006-02-15 05:03:42
<input type="checkbox"/>				6	2006	1	NULL	169	PG	2006-02-15 05:03:42
<input type="checkbox"/>				7	2006	1	NULL	62	PG-13	2006-02-15 05:03:42
<input type="checkbox"/>				8	2006	1	NULL	54	R	2006-02-15 05:03:42
<input type="checkbox"/>				9	2006	1	NULL	114	PG-13	2006-02-15 05:03:42
<input type="checkbox"/>				10	2006	1	NULL	63	NC-17	2006-02-15 05:03:42
<input type="checkbox"/>				11	2006	1	NULL	126	G	2006-02-15 05:03:42
<input type="checkbox"/>				12	2006	1	NULL	136	PG	2006-02-15 05:03:42
<input type="checkbox"/>				13	2006	1	NULL	150	PG	2006-02-15 05:03:42
<input type="checkbox"/>				14	2006	1	NULL	94	NC-17	2006-02-15 05:03:42
<input type="checkbox"/>				15	2006	1	NULL	46	NC-17	2006-02-15 05:03:42
<input type="checkbox"/>				16	2006	1	NULL	180	NC-17	2006-02-15 05:03:42
<input type="checkbox"/>				17	2006	1	NULL	82	R	2006-02-15 05:03:42
<input type="checkbox"/>				18	2006	1	NULL	57	PG-13	2006-02-15 05:03:42

Figure 59: Table "Film", normalized.

Showing rows 0 - 24 (1000 total, Query took 0.0010 seconds.)

```
SELECT * FROM `film_rental`
```

1 ▾

>

>>

| Number of rows:

25 ▾

Filter

+ Options

film_id	rental_duration	rental_rate	replacement_cost
1	6	0.99	20.99
2	3	4.99	12.99
3	7	2.99	18.99
4	5	2.99	26.99
5	6	2.99	22.99
6	3	2.99	17.99
7	6	4.99	28.99
8	6	4.99	15.99
9	3	2.99	21.99
10	6	4.99	24.99
11	6	0.99	16.99
12	6	0.99	22.99
13	4	4.99	21.99
14	6	0.99	23.99
15	5	2.99	10.99
16	6	2.99	23.99
17	3	0.99	14.99
18	6	0.99	27.99
19	6	0.99	20.99
20	4	4.99	23.99
21	3	4.99	17.99
22	6	2.99	10.99
23	3	0.99	9.99
24	6	2.99	19.99
25	3	2.99	15.99

Figure 60: Table "Film_Rental", normalized.

Showing rows 0 - 1 (2 total, Query took 0.0006 seconds.)

```
SELECT * FROM `staff`
```

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

+ Options

	<input type="checkbox"/>	staff_id	first_name	last_name	address_id	picture	email	store_id	active	last_update
	<input type="checkbox"/>	1	Mike	Hillyer	3	[BLOB - 35.5 KB]	Mike.Hillyer@sakilastaff.com	1	1	2006-02-15 03:57:16
	<input type="checkbox"/>	2	Jon	Stephens	4	NULL	Jon.Stephens@sakilastaff.com	2	1	2006-02-15 03:57:16

Figure 61: Table "Staff", normalized.

Showing rows 0 - 1 (2 total, Query took 0.0092 seconds.)

```
SELECT * FROM `staff_login`
```

Show all | Number of rows: 25 | Filter rows: Search

+ Options

staff_id	username	password
1	Mike	8cb2237d0679ca88db6464eac60da96345513964
2	Jon	NULL

Figure 62: Table "Staff_Login", newly created after normalization.

2.8.3 Table Structures After Normalization

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	district_id	int(4)			No	None	AUTO_INCREMENT	Change Drop More	
2	country_id	int(3)			No	None		Change Drop More	
3	district	varchar(25)	utf8mb4_general_ci		No	None		Change Drop More	
4	last_update	datetime			Yes	NULL		Change Drop More	

Check all With selected: [Browse](#) [Change](#) [Drop](#) [Primary](#) [Unique](#) [Index](#) [Fulltext](#) [Add](#)

[Print](#) [Propose table structure](#) [Track table](#) [Move columns](#) [Normalize](#)

[Add](#) [1] column(s) after last_update [Go](#)

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit	Drop	PRIMARY	BTREE	Yes	No	district_id	384	A	No
Edit	Drop	country_id	BTREE	No	No	country_id	384	A	No

Figure 63: Structure of table "District", normalized.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	film_id	int(4)			No	None		Change Drop More	
2	release_year	int(4)			Yes	NULL		Change Drop More	
3	language_id	int(1)			Yes	NULL		Change Drop More	
4	original_language_id	varchar(25)	utf8_general_ci		Yes	NULL		Change Drop More	
5	length	int(3)			Yes	NULL		Change Drop More	
6	rating	varchar(25)	utf8_general_ci		Yes	NULL		Change Drop More	
7	special_features	varchar(100)	utf8_general_ci		Yes	NULL		Change Drop More	
8	last_update	datetime			Yes	NULL		Change Drop More	

Figure 64: Structure of table "Film", normalized.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	film_id	int(4)			Yes	NULL		Change Drop More	
2	title	varchar(50)	utf8_general_ci		Yes	NULL		Change Drop More	
3	description	varchar(150)	utf8_general_ci		Yes	NULL		Change Drop More	

Check all With selected: [Browse](#) [Change](#) [Drop](#) [Primary](#) [Unique](#) [Index](#) [Add](#)

[Print](#) [Propose table structure](#) [Track table](#) [Move columns](#) [Normalize](#)

[Add](#) [1] column(s) after description [Go](#)

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit	Drop	film_id	BTREE	No	No	film_id	1000	A	Yes

Figure 65: Structure of table "Film_Text", normalized.

The screenshot shows the 'Staff' table structure in MySQL Workbench. The table has 9 columns:

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	staff_id	int(1)	utf8_general_ci		No	None			Change Drop More
2	first_name	varchar(50)	utf8_general_ci		Yes	NULL			Change Drop More
3	last_name	varchar(50)	utf8_general_ci		Yes	NULL			Change Drop More
4	address_id	int(3)			Yes	NULL			Change Drop More
5	picture	longblob			Yes	NULL			Change Drop More
6	email	varchar(50)	utf8_general_ci		Yes	NULL			Change Drop More
7	store_id	int(1)			Yes	NULL			Change Drop More
8	active	int(1)			Yes	NULL			Change Drop More
9	last_update	datetime			Yes	NULL			Change Drop More

Below the table, there are buttons for Print, Propose table structure, Track table, Move columns, Normalize, Add, and Go.

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	staff_id	4	A	No	
Edit Drop	address_id	BTREE	No	No	address_id	4	A	Yes	
Edit Drop	store_id	BTREE	No	No	store_id	4	A	Yes	

Figure 66: Structure of table "Staff", normalized.

The screenshot shows the 'Staff_Login' table structure in MySQL Workbench. The table has 3 columns:

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	staff_id	int(11)			No	None			Change Drop More
2	username	varchar(50)	latin1_swedish_ci		No	None			Change Drop More
3	password	varchar(50)	latin1_swedish_ci		Yes	NULL			Change Drop More

Below the table, there are buttons for Print, Propose table structure, Track table, Move columns, Normalize, Add, and Go.

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	staff_id	BTREE	No	No	staff_id	2	A	No	

Figure 67: Structure of table "Staff_Login", normalized.

2.8.4 Foreign Key Relations After Normalization

To preserve the integrity of relations inside of the database, foreign key constraints within the database have been modified based on these criterion:

- Two foreign keys have been modified with ON DELETE CASCADE as the deletion of table data involving these foreign keys will only affect this one table, and will not cascade down the entire database. The tables involved

are "Film_Actor" and "Film_Category", which have their primary keys in the tables "Actor" and "Category" respectively.

- The primary keys of three tables are left with the original ON DELETE RESTRICT constraint as these tables are central components of the entire database, and should have all deletions resolved on lower levels on the database before they themselves are allowed to be deleted. This affects all tables having a foreign key from the tables "Customer", "Film", and "Staff".
- Every other foreign key constraint is set to ON DELETE SET NULL by default. This is to facilitate easy reorganisation and maintenance on the database as this database contains numerous errata; having the ability to delete erroneous entries easily drastically improves the ease of managing and fixing the database.
- For the same reasons as above, all foreign key constraints with regards to updates have been set to ON UPDATE CASCADE. This is to accomodate the many value changes and error corrections that are expected to take place over the course of using this database.

Displayed below are examples of affected foreign key relations.



Figure 68: The table "Film_Actor" having its ON DELETE relation with "Actor" modified to CASCADE.



Figure 69: The table "Film_Category" having its ON DELETE relation with "Category" modified to CASCADE.

Actions Constraint properties		Column	Foreign key constraint (INNODB)		
		Database	Table	Column	
Drop	rental_ibfk_1	inventory_id	entertainment	inventory	inventory_id
ON DELETE	SET NULL	ON UPDATE	CASCADE		
Drop	rental_ibfk_2	customer_id	entertainment	customer	customer_id
ON DELETE	RESTRICT	ON UPDATE	CASCADE		
Drop	rental_ibfk_3	staff_id	entertainment	staff	staff_id
ON DELETE	RESTRICT	ON UPDATE	CASCADE		

Figure 70: The table "Rental" having its ON DELETE relation with "Customer" modified to RESTRICT.

Actions Constraint properties		Column	Foreign key constraint (INNODB)		
		Database	Table	Column	
Drop	store_ibfk_1	manager_staff_id	entertainment	staff	staff_id
ON DELETE	RESTRICT	ON UPDATE	CASCADE		
Drop	store_ibfk_2	address_id	entertainment	address	address_id
ON DELETE	RESTRICT	ON UPDATE	CASCADE		

Figure 71: The table "Store" having its ON DELETE relation with "Address" modified to RESTRICT.

Actions Constraint properties		Column	Foreign key constraint (INNODB)		
		Database	Table	Column	
Drop	staff_ibfk_1	address_id	entertainment	address	address_id
ON DELETE	RESTRICT	ON UPDATE	CASCADE		
Drop	staff_ibfk_2	store_id	entertainment	store	store_id
ON DELETE	RESTRICT	ON UPDATE	CASCADE		

Figure 72: The table "Staff" having its ON DELETE relation with "Store" modified to RESTRICT.

Actions Constraint properties		Column	Foreign key constraint (INNODB)		
		Database	Table	Column	
Drop	film_rental_ibfk_1	film_id	entertainment	film	film_id
ON DELETE	RESTRICT	ON UPDATE	CASCADE		

Figure 73: The table "Film_Text" having its ON DELETE relation with "Film" modified to RESTRICT.



Figure 74: A foreign key relation between original_language.id and the table "Language" has also been applied.

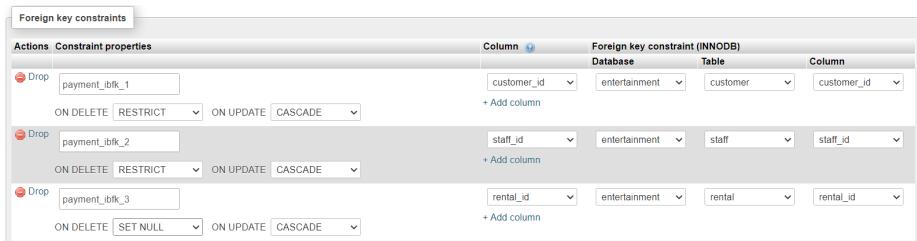


Figure 75: The table "Payment" having its ON DELETE relation with "Staff" modified to RESTRICT.



Figure 76: The default setting for foreign key relations with other tables in this database.

2.8.5 Insertion After Normalization

```
INSERT INTO `film_special_features` (`film_id`, `special_features`, `last_update`) VALUES
(1, 'Behind The Scenes', '2006-02-15 05:03:42'),
(1, 'Deleted Scenes', '2006-02-15 05:03:42'),
(2, 'Deleted Scenes', '2006-02-15 05:03:42'),
(2, 'Trailers', '2006-02-15 05:03:42'),
(3, 'Deleted Scenes', '2006-02-15 05:03:42'),
(3, 'Trailers', '2006-02-15 05:03:42'),
(4, 'Behind The Scenes', '2006-02-15 05:03:42'),
(4, 'Commentaries', '2006-02-15 05:03:42'),
(5, 'Deleted Scenes', '2006-02-15 05:03:42'),
(6, 'Deleted Scenes', '2006-02-15 05:03:42'),
(7, 'Deleted Scenes', '2006-02-15 05:03:42'),
(7, 'Trailers', '2006-02-15 05:03:42'),
(8, 'Trailers', '2006-02-15 05:03:42'),
(9, 'Deleted Scenes', '2006-02-15 05:03:42'),
(9, 'Trailers', '2006-02-15 05:03:42'),
(10, 'Deleted Scenes', '2006-02-15 05:03:42'),
(10, 'Trailers', '2006-02-15 05:03:42'),
(11, 'Behind The Scenes', '2006-02-15 05:03:42'),
(11, 'Commentaries', '2006-02-15 05:03:42'),
(12, 'Commentaries', '2006-02-15 05:03:42'),
(12, 'Deleted Scenes', '2006-02-15 05:03:42'),
(13, 'Behind The Scenes', '2006-02-15 05:03:42'),
(13, 'Deleted Scenes', '2006-02-15 05:03:42'),
(14, 'Behind The Scenes', '2006-02-15 05:03:42'),
(14, 'Deleted Scenes', '2006-02-15 05:03:42'),
(14, 'Trailers', '2006-02-15 05:03:42'),
(15, 'Behind The Scenes', '2006-02-15 05:03:42'),
(15, 'Commentaries', '2006-02-15 05:03:42'),
(15, 'Trailers', '2006-02-15 05:03:42'),
(16, 'Commentaries', '2006-02-15 05:03:42'),
(16, 'Trailers', '2006-02-15 05:03:42'),
(17, 'Behind The Scenes', '2006-02-15 05:03:42'),
(17, 'Trailers', '2006-02-15 05:03:42'),
(18, 'Behind The Scenes', '2006-02-15 05:03:42'),
```

Figure 77: Insertion of new data into the table "Film_Special_Features" after normalization

- `INSERT INTO `film_rental` (`film_id`, `rental_duration`, `rental_rate`, `replacement_cost`, `last_update`) VALUES
 (1, 6, '0.99', '20.99', '2006-02-15 05:03:42'),
 (2, 3, '4.99', '12.99', '2006-02-15 05:03:42'),
 (3, 7, '2.99', '18.99', '2006-02-15 05:03:42'),
 (4, 5, '2.99', '26.99', '2006-02-15 05:03:42'),
 (5, 6, '2.99', '22.99', '2006-02-15 05:03:42'),
 (6, 3, '2.99', '17.99', '2006-02-15 05:03:42'),
 (7, 6, '4.99', '28.99', '2006-02-15 05:03:42'),
 (8, 6, '4.99', '15.99', '2006-02-15 05:03:42'),
 (9, 3, '2.99', '21.99', '2006-02-15 05:03:42'),
 (10, 6, '4.99', '24.99', '2006-02-15 05:03:42'),
 (11, 6, '0.99', '16.99', '2006-02-15 05:03:42'),
 (12, 6, '0.99', '22.99', '2006-02-15 05:03:42'),
 (13, 4, '4.99', '21.99', '2006-02-15 05:03:42'),
 (14, 6, '0.99', '23.99', '2006-02-15 05:03:42'),
 (15, 5, '2.99', '10.99', '2006-02-15 05:03:42'),
 (16, 6, '2.99', '23.99', '2006-02-15 05:03:42'),
 (17, 3, '0.99', '14.99', '2006-02-15 05:03:42'),
 (18, 6, '0.99', '27.99', '2006-02-15 05:03:42'),
 (19, 6, '0.99', '20.99', '2006-02-15 05:03:42'),
 (20, 4, '4.99', '23.99', '2006-02-15 05:03:42'),
 (21, 3, '4.99', '17.99', '2006-02-15 05:03:42'),
 (22, 6, '2.99', '10.99', '2006-02-15 05:03:42'),
 (23, 3, '0.99', '9.99', '2006-02-15 05:03:42'),
 (24, 6, '2.99', '19.99', '2006-02-15 05:03:42'),
 (25, 3, '2.99', '15.99', '2006-02-15 05:03:42'),
 (26, 3, '0.99', '15.99', '2006-02-15 05:03:42'),
 (27, 7, '0.99', '12.99', '2006-02-15 05:03:42'),
 (28, 5, '4.99', '16.99', '2006-02-15 05:03:42'),
 (29, 5, '2.99', '11.99', '2006-02-15 05:03:42'),
 (30, 4, '2.99', '27.99', '2006-02-15 05:03:42'),
 (31, 5, '4.99', '16.99', '2006-02-15 05:03:42'),
 (32, 6, '4.99', '11.99', '2006-02-15 05:03:42'),
 (33, 5, '2.99', '15.99', '2006-02-15 05:03:42'),
 (34, 6, '0.99', '29.99', '2006-02-15 05:03:42'))`

Figure 78: Insertion of new data into the table "Film_Rental" after normalization

```

INSERT INTO `address`(`address_id`, `address`, `address2`, `city_id`, `postal_code`, `phone`, `last_update`) VALUES
(1, '47 MySakila Drive', '', 300, NULL, NULL, '2014-09-25 22:30:27'),
(2, '28 MySQL Boulevard', '', 576, NULL, NULL, '2014-09-25 22:30:09'),
(3, '23 Workhaven Lane', '', 300, NULL, '14033335568', '2014-09-25 22:30:27'),
(4, '1411 Lillydale Drive', '', 576, NULL, '6172235589', '2014-09-25 22:30:09'),
(5, '1913 Hanoi Way', '', 463, 35200, '28303384290', '2014-09-25 22:31:53'),
(6, '1121 Loja Avenue', '', 449, 17886, '838635000000', '2014-09-25 22:34:01'),
(7, '692 Joliet Street', '', 38, 83579, '448477000000', '2014-09-25 22:31:07'),
(8, '1566 Inegl Manor', '', 349, 53561, '705814000000', '2014-09-25 22:32:18'),
(9, '53 Idfu Parkway', '', 361, 42399, '10655648674', '2014-09-25 22:33:16'),
(10, '1795 Santiago de Compostela Way', '', 295, 18743, '860453000000', '2014-09-25 22:33:55'),
(11, '900 Santiago de Compostela Parkway', '', 280, 93896, '716571000000', '2014-09-25 22:34:11'),
(12, '478 Joliet Way', '', 200, 77948, '657282000000', '2014-09-25 22:32:22'),
(13, '613 Korolev Drive', '', 329, 45844, '380658000000', '2014-09-25 22:32:29'),
(14, '1531 Sal Drive', '', 162, 53628, '648857000000', '2014-09-25 22:31:36'),
(15, '1542 Tarlac Parkway', '', 440, 1827, '635297000000', '2014-09-25 22:31:53'),
(16, '808 Bhopal Manor', '', 582, 10672, '465888000000', '2014-09-25 22:31:30'),
(17, '270 Amroha Parkway', '', 384, 29610, '695480000000', '2014-09-25 22:33:27'),
(18, '770 Bydgoszcz Avenue', '', 120, 16266, '517338000000', '2014-09-25 22:33:47'),
(19, '419 Iligan Lane', '', 76, 72878, '990911000000', '2014-09-25 22:31:13'),
(20, '360 Toulouse Parkway', '', 495, 54308, '949312000000', '2014-09-25 22:33:40'),
(21, '270 Toulon Boulevard', '', 156, 81766, '487752000000', '2014-09-25 22:32:48'),
(22, '320 Brest Avenue', '', 252, 43331, '747792000000', '2014-09-25 22:32:25'),
(23, '1417 Lancaster Avenue', '', 267, 72192, '272572000000', '2014-09-25 22:33:03'),
(24, '1688 Okara Way', '', 327, 21954, '144454000000', '2014-09-25 22:32:30'),
(25, '262 A Corua (La Corua) Parkway', '', 525, 34418, '892776000000', '2014-09-25 22:30:12'),
(26, '28 Charlotte Amalie Street', '', 443, 37551, '161968000000', '2014-09-25 22:32:16'),
(27, '1788 Hino Boulevard', '', 303, 7716, '902731000000', '2014-09-25 22:31:58'),
(28, '96 Tafuna Way', '', 128, 99865, '934730000000', '2014-09-25 22:30:05'),
(29, '934 San Felipe de Puerto Plata Street', '', 472, 99788, '196496000000', '2014-09-25 22:32:31'),
(30, '18 Duisburg Boulevard', '', 121, 58327, '998010000000', '2014-09-25 22:31:08'),
(31, '217 Botshabelo Place', '', 138, 49521, '665357000000', '2014-09-25 22:32:36'),
(32, '1425 Shikarpur Manor', '', 346, 65599, '678221000000', '2014-09-25 22:31:20'),
(33, '788 Aurora Avenue', '', 474, 65750, '18461860151', '2014-09-25 22:31:53'),
(34, '1668 Anpolis Street', '', 316, 50199, '525256000000', '2014-09-25 22:33:15'),

```

Figure 79: Insertion of new data into the table "Address" after normalization

```

INSERT INTO `film` (`film_id`, `release_year`, `language_id`, `original_language_id`, `length`, `rating`, `last_update`) VALUES
(1, 2006, 1, NULL, 86, 'PG', '2006-02-15 05:03:42'),
(2, 2006, 1, NULL, 48, 'G', '2006-02-15 05:03:42'),
(3, 2006, 1, NULL, 50, 'NC-17', '2006-02-15 05:03:42'),
(4, 2006, 1, NULL, 117, 'G', '2006-02-15 05:03:42'),
(5, 2006, 1, NULL, 130, 'G', '2006-02-15 05:03:42'),
(6, 2006, 1, NULL, 169, 'PG', '2006-02-15 05:03:42'),
(7, 2006, 1, NULL, 62, 'PG-13', '2006-02-15 05:03:42'),
(8, 2006, 1, NULL, 54, 'R', '2006-02-15 05:03:42'),
(9, 2006, 1, NULL, 114, 'PG-13', '2006-02-15 05:03:42'),
(10, 2006, 1, NULL, 63, 'NC-17', '2006-02-15 05:03:42'),
(11, 2006, 1, NULL, 126, 'G', '2006-02-15 05:03:42'),
(12, 2006, 1, NULL, 136, 'PG', '2006-02-15 05:03:42'),
(13, 2006, 1, NULL, 150, 'PG', '2006-02-15 05:03:42'),
(14, 2006, 1, NULL, 94, 'NC-17', '2006-02-15 05:03:42'),
(15, 2006, 1, NULL, 46, 'NC-17', '2006-02-15 05:03:42'),
(16, 2006, 1, NULL, 180, 'NC-17', '2006-02-15 05:03:42'),
(17, 2006, 1, NULL, 82, 'R', '2006-02-15 05:03:42'),
(18, 2006, 1, NULL, 57, 'PG-13', '2006-02-15 05:03:42'),
(19, 2006, 1, NULL, 113, 'PG', '2006-02-15 05:03:42'),
(20, 2006, 1, NULL, 79, 'R', '2006-02-15 05:03:42'),
(21, 2006, 1, NULL, 129, 'R', '2006-02-15 05:03:42'),
(22, 2006, 1, NULL, 85, 'G', '2006-02-15 05:03:42'),
(23, 2006, 1, NULL, 92, 'R', '2006-02-15 05:03:42'),
(24, 2006, 1, NULL, 181, 'R', '2006-02-15 05:03:42'),
(25, 2006, 1, NULL, 74, 'G', '2006-02-15 05:03:42'),
(26, 2006, 1, NULL, 86, 'G', '2006-02-15 05:03:42'),
(27, 2006, 1, NULL, 179, 'NC-17', '2006-02-15 05:03:42'),
(28, 2006, 1, NULL, 91, 'PG-13', '2006-02-15 05:03:42'),
(29, 2006, 1, NULL, 168, 'NC-17', '2006-02-15 05:03:42'),
(30, 2006, 1, NULL, 82, 'R', '2006-02-15 05:03:42'),
(31, 2006, 1, NULL, 92, 'NC-17', '2006-02-15 05:03:42'),
(32, 2006, 1, NULL, 119, 'R', '2006-02-15 05:03:42'),
(33, 2006, 1, NULL, 153, 'PG-13', '2006-02-15 05:03:42'),
(34, 2006, 1, NULL, 62, 'NC-17', '2006-02-15 05:03:42'),

```

Figure 80: Insertion of new data into the table "Film" after normalization

```

INSERT INTO `customer` ('customer_id', 'store_id', 'first_name', 'last_name', 'email', 'address_id', 'active', 'create_date', 'last_update') VALUES
(1, 1, 'MARY', 'SMITH', 'MARY.SMITH@sakilacustomer.org', 5, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(2, 1, 'PATRICIA', 'JOHNSON', 'PATRICIA.JOHNSON@sakilacustomer.org', 6, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(3, 1, 'LINDA', 'WILLIAMS', 'LINDA.WILLIAMS@sakilacustomer.org', 7, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(4, 2, 'BARBARA', 'JONES', 'BARBARA.JONES@sakilacustomer.org', 8, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(5, 1, 'ELIZABETH', 'BROWN', 'ELIZABETH.BROWN@sakilacustomer.org', 9, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(6, 2, 'JENNIFER', 'DAVIS', 'JENNIFER.DAVIS@sakilacustomer.org', 10, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(7, 1, 'MARIA', 'MILLER', 'MARIA.MILLER@sakilacustomer.org', 11, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(8, 2, 'SUSAN', 'WILSON', 'SUSAN.WILSON@sakilacustomer.org', 12, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(9, 2, 'MARGARET', 'MOORE', 'MARGARET.MOORE@sakilacustomer.org', 13, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(10, 1, 'DOROTHY', 'TAYLOR', 'DOROTHY.TAYLOR@sakilacustomer.org', 14, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(11, 2, 'LISA', 'ANDERSON', 'LISA.ANDERSON@sakilacustomer.org', 15, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(12, 1, 'NANCY', 'THOMAS', 'NANCY.THOMAS@sakilacustomer.org', 16, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(13, 2, 'KAREN', 'JACKSON', 'KAREN.JACKSON@sakilacustomer.org', 17, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(14, 2, 'BETTY', 'WHITE', 'BETTY.WHITE@sakilacustomer.org', 18, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(15, 1, 'HELEN', 'HARRIS', 'HELEN.HARRIS@sakilacustomer.org', 19, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(16, 2, 'SANDRA', 'MARTIN', 'SANDRA.MARTIN@sakilacustomer.org', 20, 0, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(17, 1, 'DONNA', 'THOMPSON', 'DONNA.THOMPSON@sakilacustomer.org', 21, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(18, 2, 'CAROL', 'GARCIA', 'CAROL.GARCIA@sakilacustomer.org', 22, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(19, 1, 'RUTH', 'MARTINEZ', 'RUTH.MARTINEZ@sakilacustomer.org', 23, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(20, 2, 'SHARON', 'ROBINSON', 'SHARON.ROBINSON@sakilacustomer.org', 24, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(21, 1, 'NICHELLE', 'CLARK', 'NICHELLE.CLARK@sakilacustomer.org', 25, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(22, 1, 'LAURA', 'RODRIGUEZ', 'LAURA.RODRIGUEZ@sakilacustomer.org', 26, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(23, 2, 'SARAH', 'LEWIS', 'SARAH.LEWIS@sakilacustomer.org', 27, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(24, 2, 'KIMBERLY', 'LEE', 'KIMBERLY.LEE@sakilacustomer.org', 28, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(25, 1, 'DEBORAH', 'WALKER', 'DEBORAH.WALKER@sakilacustomer.org', 29, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(26, 2, 'JESSICA', 'HALL', 'JESSICA.HALL@sakilacustomer.org', 30, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(27, 2, 'SHIRLEY', 'ALLEN', 'SHIRLEY.ALLEN@sakilacustomer.org', 31, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(28, 1, 'CYNTHIA', 'YOUNG', 'CYNTHIA.YOUNG@sakilacustomer.org', 32, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(29, 2, 'ANGELA', 'HERNANDEZ', 'ANGELA.HERNANDEZ@sakilacustomer.org', 33, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(30, 1, 'MELISSA', 'KING', 'MELISSA.KING@sakilacustomer.org', 34, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(31, 2, 'BRENDA', 'WRIGHT', 'BRENDA.WRIGHT@sakilacustomer.org', 35, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(32, 1, 'AMY', 'LOPEZ', 'AMY.LOPEZ@sakilacustomer.org', 36, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(33, 2, 'ANNA', 'HILL', 'ANNA.HILL@sakilacustomer.org', 37, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(34, 2, 'REBECCA', 'SCOTT', 'REBECCA.SCOTT@sakilacustomer.org', 38, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),
(35, 2, 'VIRGINIA', 'GREEN', 'VIRGINIA.GREEN@sakilacustomer.org', 39, 1, '2006-02-14 22:04:36', '2006-02-15 04:57:20'),

```

Figure 81: Insertion of new data into the table "Customer" after normalization

```

• INSERT INTO `district` (`district_id`, `country_id`, `district`, `last_update`) VALUES
(1, 101, 'Abu Dhabi', '2021-04-15 23:20:20'),
(2, 45, 'Aceh', '2021-04-15 23:20:20'),
(3, 97, 'Adana', '2021-04-15 23:20:20'),
(4, 31, 'Addis Abeba', '2021-04-15 23:20:20'),
(5, 107, 'Aden', '2021-04-15 23:20:20'),
(6, 88, 'Adygea', '2021-04-15 23:20:20'),
(7, 98, 'Ahal', '2021-04-15 23:20:20'),
(8, 29, 'al-Qaqahliya', '2021-04-15 23:20:20'),
(9, 11, 'al-Manama', '2021-04-15 23:20:20'),
(10, 89, 'al-Qadarif', '2021-04-15 23:20:20'),
(11, 29, 'al-Qalyubiya', '2021-04-15 23:20:20'),
(12, 29, 'al-Sharqiya', '2021-04-15 23:20:20'),
(13, 82, 'al-Sharqiya', '2021-04-15 23:20:20'),
(14, 20, 'Alberta', '2021-04-15 23:20:20'),
(15, 73, 'Alto Paran', '2021-04-15 23:20:20'),
(16, 44, 'Andhra Pradesh', '2021-04-15 23:20:20'),
(17, 38, 'Anhalt Sachsen', '2021-04-15 23:20:20'),
(18, 22, 'Antofagasta', '2021-04-15 23:20:20'),
(19, 104, 'Anzotegui', '2021-04-15 23:20:20'),
(20, 49, 'Apulia', '2021-04-15 23:20:20'),
(21, 77, 'Arecibo', '2021-04-15 23:20:20'),
(22, 82, 'Asir', '2021-04-15 23:20:20'),
(23, 44, 'Assam', '2021-04-15 23:20:20'),
(24, 87, 'Asturia', '2021-04-15 23:20:20'),
(25, 73, 'Asuncin', '2021-04-15 23:20:20'),
(26, 39, 'Attika', '2021-04-15 23:20:20'),
(27, 38, 'Baden-Wrttemberg', '2021-04-15 23:20:20'),
(28, 38, 'Baijeri', '2021-04-15 23:20:20'),
(29, 60, 'Baja California', '2021-04-15 23:20:20'),
(30, 60, 'Baja California Sur', '2021-04-15 23:20:20'),
(31, 10, 'Baki', '2021-04-15 23:20:20'),
(32, 97, 'Balikesir', '2021-04-15 23:20:20'),
(33, 37, 'Banjul', '2021-04-15 23:20:20'),
(34, 91, 'Basel-Stadt', '2021-04-15 23:20:20'),

```

Figure 82: Insertion of new data into the table "District" after normalization

```

INSERT INTO `city` (`city_id`, `district_id`, `city`, `last_update`) VALUES
(1, 110, 'A Corua (La Corua)', '2006-02-15 04:45:25'),
(2, 22, 'Abha', '2006-02-15 04:45:25'),
(3, 1, 'Abu Dhabi', '2006-02-15 04:45:25'),
(4, 82, 'Acua', '2006-02-15 04:45:25'),
(5, 3, 'Adana', '2006-02-15 04:45:25'),
(6, 4, 'Addis Abeba', '2006-02-15 04:45:25'),
(7, 5, 'Aden', '2006-02-15 04:45:25'),
(8, 16, 'Adoni', '2006-02-15 04:45:25'),
(9, 198, 'Ahmadnagar', '2006-02-15 04:45:25'),
(10, 353, 'Akishima', '2006-02-15 04:45:25'),
(11, 250, 'Akron', '2006-02-15 04:45:25'),
(12, 1, 'al-Ayn', '2006-02-15 04:45:25'),
(13, 205, 'al-Hawiya', '2006-02-15 04:45:25'),
(14, 9, 'al-Manama', '2006-02-15 04:45:25'),
(15, 10, 'al-Qadarif', '2006-02-15 04:45:25'),
(16, 12, 'al-Qatif', '2006-02-15 04:45:25'),
(17, 267, 'Alessandria', '2006-02-15 04:45:25'),
(18, 166, 'Allappuzha (Alleppey)', '2006-02-15 04:45:25'),
(19, 118, 'Allende', '2006-02-15 04:45:25'),
(20, 50, 'Almirante Brown', '2006-02-15 04:45:25'),
(21, 285, 'Alvorada', '2006-02-15 04:45:25'),
(22, 344, 'Ambattur', '2006-02-15 04:45:25'),
(23, 360, 'Amersfoort', '2006-02-15 04:45:25'),
(24, 361, 'Amroha', '2006-02-15 04:45:25'),
(25, 284, 'Angra dos Reis', '2006-02-15 04:45:25'),
(26, 117, 'Anpolis', '2006-02-15 04:45:25'),
(27, 18, 'Antofagasta', '2006-02-15 04:45:25'),
(28, 117, 'Aparecida de Goinia', '2006-02-15 04:45:25'),
(29, 114, 'Apeldoorn', '2006-02-15 04:45:25'),
(30, 318, 'Araatuba', '2006-02-15 04:45:25'),
(31, 201, 'Arak', '2006-02-15 04:45:25'),
(32, 21, 'Arecibo', '2006-02-15 04:45:25'),
(33, 350, 'Arlington', '2006-02-15 04:45:25'),
(34, 124, 'Ashdod', '2006-02-15 04:45:25'),

```

Figure 83: Insertion of new data into the table "City" after normalization

The screenshot shows the MySQL Workbench interface with the following details:

- Query Editor:**
 - Message: "2 rows inserted."
 - SQL Query: `INSERT INTO `staff` (`staff_id`, `first_name`, `last_name`, `picture`, `email`, `store_id`, `active`, `last_update`) VALUES ('3', 'Charles', 'McGill', '3 [BLOB - 35.5 KB]', 'Charles.MG@sakilastaff.com', '1', '1', '2021-04-04 14:31:41'), ('4', 'Walter', 'White', '143 [BLOB - 35.5 KB]', 'Walter.W@sakilastaff.com', '2', '1', '2021-04-04 14:31:41');`
 - Buttons: [Edit inline] [Edit] [Create PHP code]
- Results:**
 - Message: "Showing rows 0 - 3 (total. Query took 0.0006 seconds.)"
 - SQL Query: `SELECT * FROM `staff``
- Table View:**

	Show all	Number of rows:	25	Filter rows:	Search this table	Sort by key:	None						
+ Options													
	<input type="button" value="T"/>			staff_id	first_name	last_name	address_id	picture	email	store_id	active	last_update	
	<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	1	Mike	Hillyer	3	[BLOB - 35.5 KB]	Mike.Hillyer@sakilastaff.com	1	1	2006-02-15 03:57:16
	<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	2	Jon	Stephens	4	NULL	Jon.Stephens@sakilastaff.com	2	1	2006-02-15 03:57:16
	<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	3	Charles	McGill	200	NULL	Charles.MG@sakilastaff.com	1	1	2021-04-04 14:31:41
	<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	4	Walter	White	143	NULL	Walter.W@sakilastaff.com	2	1	2021-04-04 14:31:41

Figure 84: Insertion of new data into the table "Staff" after normalization

The screenshot shows the MySQL Workbench interface with the following details:

- Query Editor:**
 - Message: "2 rows inserted."
 - SQL Query: `INSERT INTO `staff_login` (`staff_id`, `username`, `password`) VALUES ('3', 'Legal', 'Kim'), ('4', 'White', 'Powder');`
- Table View:**

staff_id	username	password
1	Mike	8cb2237d0679ca88db6464eac60da96345513964
2	Jon	NULL
3	Legal	Kim
4	White	Powder

Figure 85: Insertion of new data into the table "Staff_Login" after normalization

2.8.6 Deletion After Normalization

Due to repurposing of Staff IDs into an Auto Incremented Primary Key, the following deletions were made to bring all the tables into consistency.

✓ 2 rows affected. (Query took 0.0147 seconds.)

```
DELETE FROM `staff` WHERE `staff_id` = 3 || `staff_id` = 4
```

✓ Showing rows 0 - 1 (2 total, Query took 0.0005 seconds.)

```
SELECT * FROM `staff`
```

<input type="checkbox"/> Show all	Number of rows:	25	Filter rows:	Search this table	Sort by key:	None																																				
<input type="checkbox"/> Options <table border="1"> <thead> <tr> <th>← T →</th> <th>▼ staff_id</th> <th>first_name</th> <th>last_name</th> <th>address_id</th> <th>picture</th> <th>email</th> <th>store_id</th> <th>active</th> <th>last_update</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td>Edit</td> <td>Copy</td> <td>Delete</td> <td>1</td> <td>Mike</td> <td>Hillyer</td> <td>3</td> <td>[BLOB - 35.5 KB]</td> <td>Mike.Hillyer@sakilastaff.com</td> <td>1</td> <td>1</td> <td>2006-02-15 03:57:16</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Edit</td> <td>Copy</td> <td>Delete</td> <td>2</td> <td>Jon</td> <td>Stephens</td> <td>4</td> <td>NULL</td> <td>Jon.Stephens@sakilastaff.com</td> <td>2</td> <td>1</td> <td>2006-02-15 03:57:16</td> </tr> </tbody> </table>							← T →	▼ staff_id	first_name	last_name	address_id	picture	email	store_id	active	last_update	<input type="checkbox"/>	Edit	Copy	Delete	1	Mike	Hillyer	3	[BLOB - 35.5 KB]	Mike.Hillyer@sakilastaff.com	1	1	2006-02-15 03:57:16	<input type="checkbox"/>	Edit	Copy	Delete	2	Jon	Stephens	4	NULL	Jon.Stephens@sakilastaff.com	2	1	2006-02-15 03:57:16
← T →	▼ staff_id	first_name	last_name	address_id	picture	email	store_id	active	last_update																																	
<input type="checkbox"/>	Edit	Copy	Delete	1	Mike	Hillyer	3	[BLOB - 35.5 KB]	Mike.Hillyer@sakilastaff.com	1	1	2006-02-15 03:57:16																														
<input type="checkbox"/>	Edit	Copy	Delete	2	Jon	Stephens	4	NULL	Jon.Stephens@sakilastaff.com	2	1	2006-02-15 03:57:16																														

Figure 86: Data deletion from the table "Staff" after normalization

✓ 2 rows affected. (Query took 0.0065 seconds.)

```
DELETE FROM `staff_login` WHERE `staff_id` = 3 || `staff_id` = 4
```

✓ Showing rows 0 - 1 (2 total, Query took 0.0005 seconds.)

```
SELECT * FROM `staff_login`
```

<input type="checkbox"/> Show all	Number of rows:	25	Filter rows:	Search									
<input type="checkbox"/> Options <table border="1"> <thead> <tr> <th>staff_id</th> <th>username</th> <th>password</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Mike</td> <td>8cb2237d0679ca88db6464eac60da96345513964</td> </tr> <tr> <td>2</td> <td>Jon</td> <td>NULL</td> </tr> </tbody> </table>					staff_id	username	password	1	Mike	8cb2237d0679ca88db6464eac60da96345513964	2	Jon	NULL
staff_id	username	password											
1	Mike	8cb2237d0679ca88db6464eac60da96345513964											
2	Jon	NULL											

Figure 87: Data deletion from the table "Staff_Login" after normalization

2.8.7 Updates After Normalization

The screenshot shows a MySQL command-line interface. At the top, a green checkmark icon indicates "1 row affected. (Query took 0.0114 seconds.)". Below this, the SQL command is displayed: "UPDATE `staff_login` SET `password`='Phone' WHERE `staff_id` = 3". The result of the update is shown in a table:

staff_id	username	password
1	Mike	8cb2237d0679ca88db6464eac60da96345513964
2	Jon	NULL
3	Legal	Phone
4	White	Powder

Figure 88: Update on the table "Staff_Login" after normalization

2.9 Selections Based on Original Database Using the WHERE Keyword

Showing rows 0 - 24 (326 total, Query took 0.0010 seconds.)

```
SELECT `customer_id`, `first_name`, `last_name` FROM `customer` WHERE `store_id`=1
```

1 > >> | Show all | Number of rows: 25 F

+ Options

	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	customer_id	first_name	last_name
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	1	MARY	SMITH
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	2	PATRICIA	JOHNSON
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	3	LINDA	WILLIAMS
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	5	ELIZABETH	BROWN
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	7	MARIA	MILLER
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	10	DOROTHY	TAYLOR
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	12	NANCY	THOMAS
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	15	HELEN	HARRIS
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	17	DONNA	THOMPSON
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	19	RUTH	MARTINEZ
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	21	MICHELLE	CLARK
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	22	LAURA	RODRIGUEZ
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	25	DEBORAH	WALKER
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	28	CYNTHIA	YOUNG
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	30	MELISSA	KING
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	32	AMY	LOPEZ
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	37	PAMELA	BAKER
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	38	MARTHA	GONZALEZ
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	39	DEBRA	NELSON
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	41	STEPHANIE	MITCHELL
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	44	MARIE	TURNER
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	45	JANET	PHILLIPS
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	47	FRANCES	PARKER
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	48	ANN	EVANS
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	50	DIANE	COLLINS

Figure 89: Table "Customer"

```

    ✓ Showing rows 0 - 24 (194 total, Query took 0.0008 seconds.)

SELECT `film_id`, `release_year` FROM `film` WHERE `rating`='PG'

```

1 < > >> | Show all | Number of rows: []

+ Options

	<input type="checkbox"/>		Edit		Copy		Delete	film_id	release_year
								1	2006
								6	2006
								12	2006
								13	2006
								19	2006
								37	2006
								41	2006
								63	2006
								65	2006
								72	2006
								74	2006
								78	2006
								84	2006
								88	2006
								91	2006
								93	2006
								99	2006
								103	2006
								121	2006
								122	2006
								131	2006
								132	2006
								134	2006
								137	2006
								139	2006

Figure 90: Table "Film"

Showing rows 0 - 24 (64 total, Query took 0.001)

```
SELECT * FROM `film_category` WHERE `category_id`=1
```

1 < > >> Show all | Number

+ Options

film_id	category_id	last_update
19	1	2006-02-15 05:07:09
21	1	2006-02-15 05:07:09
29	1	2006-02-15 05:07:09
38	1	2006-02-15 05:07:09
56	1	2006-02-15 05:07:09
67	1	2006-02-15 05:07:09
97	1	2006-02-15 05:07:09
105	1	2006-02-15 05:07:09
111	1	2006-02-15 05:07:09
115	1	2006-02-15 05:07:09
126	1	2006-02-15 05:07:09
130	1	2006-02-15 05:07:09
162	1	2006-02-15 05:07:09
194	1	2006-02-15 05:07:09
205	1	2006-02-15 05:07:09
210	1	2006-02-15 05:07:09
212	1	2006-02-15 05:07:09
229	1	2006-02-15 05:07:09
250	1	2006-02-15 05:07:09
252	1	2006-02-15 05:07:09
253	1	2006-02-15 05:07:09
271	1	2006-02-15 05:07:09
287	1	2006-02-15 05:07:09
292	1	2006-02-15 05:07:09
303	1	2006-02-15 05:07:09

Figure 91: Table "Film_Category"

Showing rows 0 - 24 (2270 total, Query took 0.0017 seconds.)

```
SELECT * FROM `inventory` WHERE `store_id`=1
```

1 > >> | Number of rows: 25 | Filter rows: Search this table

+ Options

	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	inventory_id	film_id	store_id	last_update
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	1	1	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	2	1	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	3	1	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	4	1	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	16	4	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	17	4	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	18	4	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	19	4	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	26	6	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	27	6	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	28	6	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	32	7	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	33	7	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	41	9	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	42	9	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	43	9	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	46	10	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	47	10	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	48	10	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	49	10	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	53	11	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	54	11	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	55	11	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	56	11	1	2006-02-15 05:09:17
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	60	12	1	2006-02-15 05:09:17

Figure 92: Table "Inventory"

Showing rows 0 - 16 (17 total, Query took 0.0027 seconds.)

```
SELECT * FROM `payment` WHERE `staff_id` = 1 && `customer_id` = 1
```

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

+ Options

	payment_id	customer_id	staff_id	rental_id	amount	payment_date	last_update
<input type="checkbox"/>   	1	1	1	76	2.99	2005-05-25 11:30:37	2006-02-15 22:12:30
<input type="checkbox"/>   	2	1	1	573	0.99	2005-05-28 10:35:23	2006-02-15 22:12:30
<input type="checkbox"/>   	3	1	1	1185	5.99	2005-06-15 00:54:12	2006-02-15 22:12:30
<input type="checkbox"/>   	6	1	1	1725	4.99	2005-06-16 15:18:57	2006-02-15 22:12:30
<input type="checkbox"/>   	7	1	1	2308	4.99	2005-06-18 08:41:48	2006-02-15 22:12:30
<input type="checkbox"/>   	9	1	1	3284	3.99	2005-06-21 06:24:45	2006-02-15 22:12:30
<input type="checkbox"/>   	11	1	1	4611	5.99	2005-07-08 07:33:56	2006-02-15 22:12:30
<input type="checkbox"/>   	12	1	1	5244	4.99	2005-07-09 13:24:07	2006-02-15 22:12:30
<input type="checkbox"/>   	13	1	1	5326	4.99	2005-07-09 16:38:01	2006-02-15 22:12:30
<input type="checkbox"/>   	14	1	1	6163	7.99	2005-07-11 10:13:46	2006-02-15 22:12:30
<input type="checkbox"/>   	16	1	1	7841	4.99	2005-07-28 09:04:45	2006-02-15 22:12:30
<input type="checkbox"/>   	18	1	1	8074	0.99	2005-07-28 17:33:39	2006-02-15 22:12:30
<input type="checkbox"/>   	24	1	1	11367	0.99	2005-08-02 18:01:38	2006-02-15 22:12:30
<input type="checkbox"/>   	26	1	1	12250	0.99	2005-08-18 03:57:29	2006-02-15 22:12:30
<input type="checkbox"/>   	29	1	1	14762	0.99	2005-08-21 23:33:57	2006-02-15 22:12:30
<input type="checkbox"/>   	30	1	1	14825	1.99	2005-08-22 01:27:57	2006-02-15 22:12:30
<input type="checkbox"/>   	32	1	1	15315	5.99	2005-08-22 20:03:46	2006-02-15 22:12:30

Figure 93: Table "Payment"

3 Report Part C

3.1 Website Link

[Link to the Mercury Website](#)

3.2 Website Video Showcase

[Link to Demonstration Video \(OneDrive\)](#)

3.3 Github Repository Link

[Link to Webcode](#)

3.4 Website Features

The website includes multiple features to enhance the user experience of the website. Among these include:

- Basic insertion, update and deletion functionality
- Ability to search for specific database entries via any column via Selection
- No requirement for all data fields to be filled for updates
- Responsive website elements that will adapt to fit screens of any resolution and size
- Dropdown bar to ease transitioning between different tables
- Dialogs to report database status after any operation
- CSS design to enhance the visual appeal and increase fluidity of all website elements

3.5 Website Interface and Code Examples

```
1  .linear_container {  
2      width: 450px;  
3      margin: 0 auto;  
4  }  
5  
6  * {  
7      box-sizing: border-box;  
8  }  
9  
10 .w3-container {  
11     overflow-x:auto;  
12 }  
13  
14 [class*="col-"] {  
15     /* Mobile Support */  
16     width: 100%;  
17 }  
18  
19  
20 @media only screen and (min-width: 768px) {  
21     /* Desktop Support */  
22     .col-1 {width: 8.33%;}  
23     .col-2 {width: 16.66%;}  
24     .col-3 {width: 25%;}  
25     .col-4 {width: 33.33%;}  
26     .col-5 {width: 41.66%;}  
27     .col-6 {width: 50%;}  
28     .col-7 {width: 58.33%;}  
29     .col-8 {width: 66.66%;}  
30     .col-9 {width: 75%;}  
31     .col-10 {width: 83.33%;}  
32     .col-11 {width: 91.66%;}  
33     .col-12 {width: 100%;}  
34 }  
35  
36  
37 [class*="col-"] {  
38     float: left;  
39     padding: 15px;  
40 }  
41  
42 .row::after {  
43     content: "";  
44     clear: both;  
45     display: table;  
46 }  
47  
48 html {  
49     font-family: 'Montserrat', sans-serif;  
50     font-size: 15px;    66
```

Figure 94: CSS code to design the website and ensure mobile compatibility.

2021-04-30 17:16:08

Country (Select / Insert / Update/ Delete)

Country ID	<input type="text" value="Enter Country ID"/>	<input type="button" value="SELECT"/>
Country (insert or change to)	<input type="text" value="Enter Country Name"/>	<input type="button" value="SELECT"/>
<input type="button" value="+ Insert"/> <input type="button" value="Update"/> <input type="button" value="Delete"/>		
Choose a table from the list:		<input type="button" value="Submit"/>

Figure 95: Website view with a desktop monitor.



Figure 96: Website view with a mobile device.
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