Centralized Network of Online Communities

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Submitted To:

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1 ER Data Model
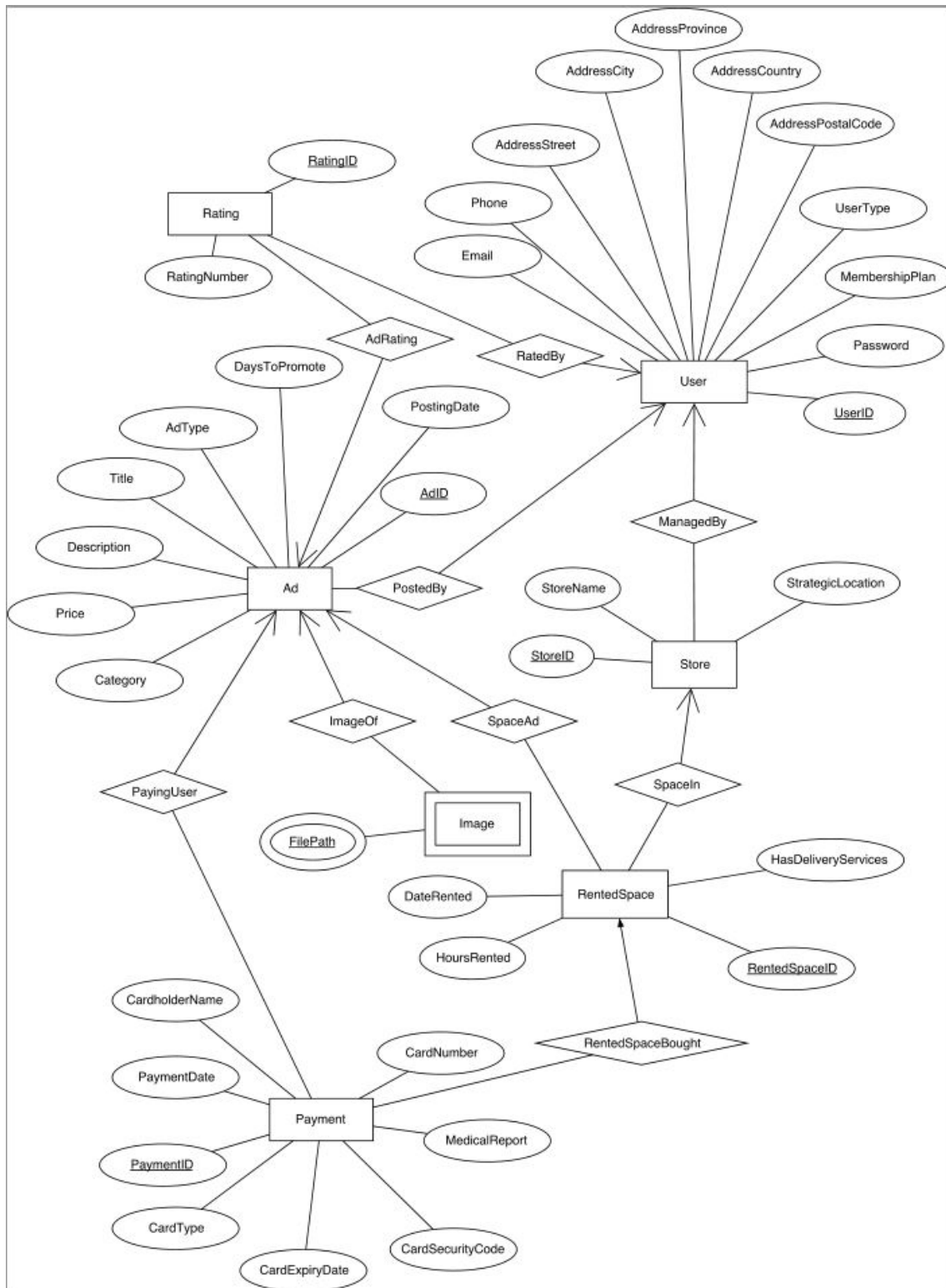
2 Relational Model

Users(<u>UserID</u>, Password, UserType, MembershipPlan, Phone, Email, AddressStreet, AddressCity, AddressProvince, AddressCountry, AddressPostalCode);

Ads(<u>AdID</u>, **PostingUserID**, PostingDate, DaysToPromote, AdType, Title, Description, PriceInCADCents, Category);

Images(<u>FilePath</u>, **AdID**);

Stores(<u>StoreID</u>, **ManagerUserID**, StoreName, StrategicLocation);

RentedSpaces(<u>RentedSpaceID</u>, **AdID**, **StoreID**, DateRented, HoursRented, DeliveryServices);

Payments(<u>PaymentID</u>, **PayingUserID**, **RentedSpaceID**, AmountInCADCents, CardNumber, CardExpiryDate, CardSecurityCode, CardholderName, CardCompany, CardType, PaymentDate);

ExternalBackupPayments(<u>PaymentID</u>, **PayingUserID**, **RentedSpaceID**, AmountInCADCents, CardNumber, CardExpiryDate, CardSecurityCode, CardholderName, CardCompany, CardType, PaymentDate);

Ratings(<u>RatingID</u>, **AdIDBeingRated**, **UserIDRatingAd**, Rating);

All of our tables (schemas) have an ID as a key and the ID determines every row in the table, i.e. every table has exactly one FD of the form $K \to ABC...$ where K is the key and ABC... is all the rows in the table. Since the LHS of every FD in our DB is a key (superkey) of its corresponding table (schema), our DB is in BCNF.

3   User Interface

3.1   User Login/Registration

OCN Portal

Please log in to continue

Email:

Password:

Log in

Don't have an account? Sign up

Email:

Username:

Password:

Phone number:

Address:

City:

Province:

Country:

Postal code:

Sign Up

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3.2 Post Ad (Select Province/City and Category)

3.3 Select/Pay Membership

3.4 Post Ad (Selling an Item)

Fill the form to submit an ad

Email or Phone number	
Price - in CAD	
Category	Sell ▾
Title	
Description	

3.5 Promoting an Ad

Purchase Promotion (Optional)

A promotion package increases the rank of your ad. The packages available are:

- ◉ No Promotion
- ○ 7 days promotion - 10$
- ○ 30 days - 50$
- ○ 60 days - 90$

3.6   View Posted/Expired Ads

OCN Portal

Your ads:

Title	Description	Price	Ad Type	Address	Edit	Delete
buying a copy of 1984	Need a copy of this so I can put it on my shelf and not read it.	$10	Buy	3043 Sherbrooke Ouest Montreal Quebec Canada E6K 1Y2	Edit	Delete

3.7 Delete Ad

ocn says:

Ad deleted successfully.

OK

Title	Description	Price	Ad Type	Address	Edit	Delete
looking to rent a wedding dress	Going to need it for a couple of nights, my waifu and I are celebrating the first time I watched Moshi Moshi Desu Desu Adventure.	$500	Buy	4328 Carling Avenue Ottawa Ontario Canada L3K 1S4	Edit	Delete
buying life-size anime girl	Must be self-cleaning and non-judgemental.	$10	Buy	4328 Carling Avenue Ottawa Ontario Canada L3K 1S4	Edit	Delete

Select Membership and Payment

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OCN Portal

Your ads:

Title	Description	Price	Ad Type	Address	Edit	Delete
looking to rent a wedding dress	Going to need it for a couple of nights, my waifu and I are celebrating the first time I watched Moshi Moshi Desu Desu Adventure.	$500	Buy	4328 Carling Avenue Ottawa Ontario Canada L3K 1S4	Edit	Delete

Select Membership and Payment

3.8 Edit Ad

Fill the form to submit an ad

Email or Phone number	sakusha@verizon.net
Price - in CAD	100000
Category	Buy ▼
Title	buying a copy of 1984
Description	Need a copy of this so I can put it on my s

Purchase Promotion (Optional)

A promotion package increases the rank of your ad. The packages available are:

◉ No Promotion

○ 7 days promotion - 10$

○ 30 days - 50$

○ 60 days - 90$

Rent Physical Space (Optional)

◉ I do not wish to rent a store.

○ I wish to rent a store.

Submit

3.9 Browse Seller

You are viewing aliens-vs-zimbabwe's ads in Ottawa

Title	Description	Seller	Rate Product
looking to rent a wedding dress	Going to need it for a couple of nights, my waifu and I are celebrating the first time I watched Moshi Moshi Desu Desu Adventure.	aliens-vs-zimbabwe	Rate Product ⬤⬤⬤⬤⬤
buying life-size anime girl	Must be self-cleaning and non-judgemental.	aliens-vs-zimbabwe	Rate Product ⬤⬤⬤⬤⬤

3.10 View Other Ads in Category

You are viewing Books ads in Montreal

Title	Description	Price	Seller	Ad Type	Address	Rate Product
buying books on horticulture	My friend Ricky is an aspiring herbalist/shaman and really needs these books. Preferably at a grade-10 reading level or lower.	$20	not-a-drug-dealer	Buy	909 Papineau Avenue Montreal Quebec Canada L8E 2V1	Rate Product ⬤⬤⬤⬤⬤
buying a copy of 1984	Need a copy of this so I can put it on my shelf and not read it.	$10	teh-tom	Buy	3043 Sherbrooke Ouest Montreal Quebec Canada E6K 1Y2	Rate Product ⬤⬤⬤⬤⬤

3.11 Rate Ad

ocn says:

Rating received, thank you!

OK

OCN Porta

You are viewing Books ads in Montreal

Title	Description	Price	Seller	Ad Type	Address	Rate Product
buying books on horticulture	My friend Ricky is an aspiring herbalist/shaman and really needs these books. Preferably at a grade-10 reading level or lower.	$20	not-a-drug-dealer	Buy	909 Papineau Avenue Montreal Quebec Canada L8E 2V1	Rate Product ●●●○○

3.12 Admin - Manage Payments

OCN Portal

Payment ID	Paying User ID	Rented Space ID	Amount	Card Number	Card Expiry Date	Card Security Code	Cardholder Name	Card Company	Card Type	Payment Date
11	my-life-is-survival-horror	1	$170	6978251547554178	2020-01-11	383	Wanda Walsh	American Express	Credit	2017-01-03 00:00:00
1	my-life-is-survival-horror	null	$10	0843065502988806	2020-01-01	178	Wanda Walsh	Visa	Credit	2017-01-04 00:00:00
12	frankie	3	$80	6955950112214111	2020-01-12	763	Connor MacBone	Discover	Credit	2017-01-04 00:00:00
2	not-a-drug-dealer	null	$50	5018754410750838	2020-01-02	805	Katherine Allen	MasterCard	Credit	2017-01-05 00:00:00
13	dark-messiah	5	$80	5202143370315456	2020-01-13	152	Dangus Dongus	Visa	Credit	2017-01-05 00:00:00
3	dark-messiah	null	$10	6806082066763681	2020-01-03	112	Kurt Hanson	American Express	Credit	2017-01-07 00:00:00
4	blood-and-bacon	null	$10	0442810600176467	2020-01-04	376	Ginger Larson	Discover	Credit	2017-01-08 00:00:00
5	prepare-to-dunk	null	$10	0177946722808477	2020-01-05	637	Adrian Jenkins	Visa	Credit	2017-01-10 00:00:00
6	serious-samson	null	$50	1224042967809802	2020-01-06	586	Shelly Howard	MasterCard	Credit	2017-01-11 00:00:00
7	fallout-isnt-that-great	null	$10	2417456979726711	2020-01-07	307	Elisa Christensen	American Express	Credit	2017-01-13 00:00:00
8	rocket-league-is-a-visual-novel	null	$50	9278570453372441	2020-01-08	739	Laurie Fox	Discover	Credit	2017-01-14 00:00:00
14	serious-samson	2	$90	1212500501131886	2020-01-21	960	Vanessa Herrera	Visa	Credit	2017-01-16 00:00:00
15	totally-postal	4	$90	6145214887837421	2020-01-22	584	Frankie Edgar	MasterCard	Credit	2017-01-17 00:00:00
16	serious-samson	6	$90	4104657558633889	2020-01-23	830	Vanessa Herrera	American Express	Credit	2017-01-18 00:00:00
9	aliens-vs-zimbabwe	null	$10	9449912989573880	2020-01-09	697	Jamie Newman	Visa	Credit	2017-01-19 00:00:00
10	aliens-vs-zimbabwe	null	$50	7311081348111520	2020-01-10	714	Glenn Davidson	MasterCard	Credit	2017-01-20 00:00:00

3.13   Admin - Manage Ads

OCN Portal

You are viewing all ads in all cities.

Title	Description	Price	Seller	Ad Type	Address	
buying a copy of 1984	Need a copy of this so I can put it on my shelf and not read it.	$10	teh-tom	Buy	3043 Sherbrooke Ouest Montreal Quebec Canada E6K 1Y2	Edit Delete
selling my guitar	I didn't get as many girls as I thought I would playing this so I'm putting it up for sale.	$30	frankie	Sell	2792 Ste. Catherine Ouest Montreal Quebec Canada L0N 2G1	Edit Delete
selling stun gun	Zap zap watchin' mother truckers go flat on their back!	$40	totally-postal	Sell	2629 Merton Street Toronto Ontario Canada J3X 3K3	Edit Delete
buying durags	Trying to keep all the toxic avenger chemicals I use to straighten my hair from getting on my pillow at night.	$5	kangz-and-kweens	Buy	638 Eglinton Avenue Toronto Ontario Canada B4N 1S6	Edit Delete
looking for someone to plan my dog's birthday	My wife and I don't have children so we figured to fill the void in our life we'd just spoil our pets.	$100	freedum	Buy	4229 rue Garneau Quebec City Quebec Canada T4G 0A7	Edit Delete

3.14   Admin - Trigger Payment Backup

12	frankie	3						Discover	Credit	2017-01-04 00:00:00
2	not-a-drug-dealer	null	$50	5018754410750838	2020-01-02	805	Katherine Allen	MasterCard	Credit	2017-01-05 00:00:00
13	dark-messiah	5	$80	5202143370315456	2020-01-13	152	Dangus Dongus	Visa	Credit	2017-01-05 00:00:00
3	dark-messiah	null	$10	6806082066763681	2020-01-03	112	Kurt Hanson	American Express	Credit	2017-01-07 00:00:00
4	blood-and-bacon	null	$10	0442810600176467	2020-01-04	376	Ginger Larson	Discover	Credit	2017-01-08 00:00:00
5	prepare-to-dunk	null	$10	0177946722808477	2020-01-05	637	Adrian Jenkins	Visa	Credit	2017-01-10 00:00:00
6	serious-samson	null	$50	1224042967809802	2020-01-06	586	Shelly Howard	MasterCard	Credit	2017-01-11 00:00:00
7	fallout-isnt-that-great	null	$10	2417456979726711	2020-01-07	307	Elisa Christensen	American Express	Credit	2017-01-13 00:00:00
8	rocket-league-is-a-visual-novel	null	$50	9278570453372441	2020-01-08	739	Laurie Fox	Discover	Credit	2017-01-14 00:00:00
14	serious-samson	2	$90	1212500501131886	2020-01-21	960	Vanessa Herrera	Visa	Credit	2017-01-16 00:00:00
15	totally-postal	4	$90	6145214887837421	2020-01-22	584	Frankie Edgar	MasterCard	Credit	2017-01-17 00:00:00
16	serious-samson	6	$90	4104657558633889	2020-01-23	830	Vanessa Herrera	American Express	Credit	2017-01-18 00:00:00
9	aliens-vs-zimbabwe	null	$10	9449912989573880	2020-01-09	697	Jamie Newman	Visa	Credit	2017-01-19 00:00:00
10	aliens-vs-zimbabwe	null	$50	7311081348111520	2020-01-10	714	Glenn Davidson	MasterCard	Credit	2017-01-20 00:00:00

Send pending payments to external processing department

3.15 Admin - Generate Reports

OCN Portal

List the users with the most ads

List the ads posted within the past 10 days

User details for users selling men's jackets in Quebec

List all the "rent" items

List the highest rated items based on city and province

Select a province.. ▼

Get the daily revenue and number of transactions by given store manager (past 15 days)

Manager ID: [   ]

Get the store rent profitability SL-1 SL-4 on weekends or weekdays

List the types of items sold by each store in given province

Ontario ▼

List a given seller's upcoming 7 day delivery fees, and past 7 day fees

[   ]

Get information about administrators

Get information about buyers

Get information about managers

Get information about sellers

4   User Guide

4.1   Sample Session - User

4.1.1   Login/Register

First we must log in or register a new account. Both will result in the user being redirected to the next page.
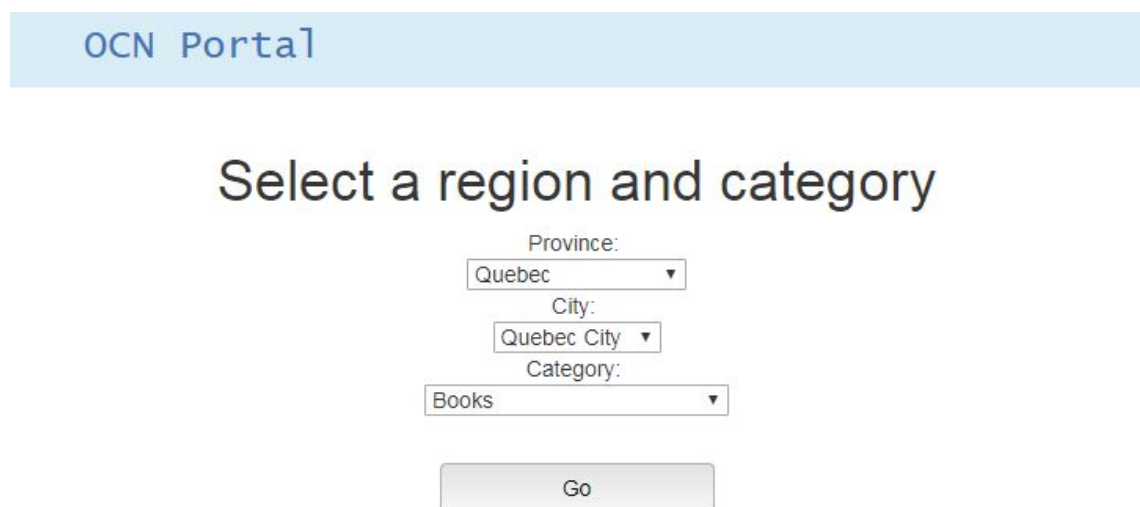
4.1.2 Landing page

Now the user may select whether they wish to post a new ad, view ads by city/province and category, or edit their profile.

4.1.3 Post an ad

To post a new ad a user must first select the region they wish to advertise in and the category the ad falls under.

After this the user is asked to enter the required information for posting an ad.

OCN Portal

Fill the form to submit an ad

Email or Phone number 515-313-3113

Price - in CAD 10

Category Sell

Title Fake ad

Description This is a test ad!

Purchase Promotion (Optional)

A promotion package increases the rank of your ad. The packages available are:

○ No Promotion

○ 7 days promotion - 10$

○ 30 days - 50$

○ 60 days - 90$

Rent Physical Space (Optional)

○ I do not wish to rent a store.

○ I wish to rent a store.

Submit

4.1.4 View ads

Here we select what province and city we wish to view ads in as well as the specific
category of interest.

The user is redirected to a page with all ads which match their criteria.

Title	Description	Price	Seller	Ad Type	Address	Rate Product
selling stun gun	Zap zap watchin' mother truckers go flat on their back!	$40	totally-postal	Sell	2629 Merton Street Toronto Ontario Canada J3X 3K3	Rate Product ⬤⬤⬤⬤⬤

4.1.5 Go to my profile

Here the user can either edit or delete their ads, or they can change their membership plan.

OCN Portal

Your ads:

Title	Description	Price	Ad Type	Address	Edit	Delete
buying a copy of 1984	Need a copy of this so I can put it on my shelf and not read it.	$10	Buy	3043 Sherbrooke Ouest Montreal Quebec Canada E6K 1Y2	Edit	Delete
Fake ad	This is a test ad!	$10	Sell	3043 Sherbrooke Ouest Montreal Quebec Canada E6K 1Y2	Edit	Delete

Select Membership and Payment

4.1.6 Select Membership and Payment

Here we can upgrade our user account to extend the visibility of our ads and make a payment if we choose to upgrade to Silver or Premium.

4.2 Sample Session - Admin

4.2.1 Login

First we must log in, if the account in question is of UserType admin then the admin will be redirected to page which allows them admin related control over the system. Otherwise the non-user admin will simply be redirected to a regular user page.

4.2.2 Landing page

The admin is able to either view all ads that are posted or go to the "Admin Console" from here.

4.2.3 View all ads

From here the admin can view all the ads on the platform and either edit or delete them.

OCN Portal

You are viewing all ads in all cities.

Title	Description	Price	Seller	Ad Type	Address	
buying a copy of 1984	Need a copy of this so I can put it on my shelf and not read it.	$10	teh-tom	Buy	3043 Sherbrooke Ouest Montreal Quebec Canada E6K 1Y2	Edit Delete
selling my guitar	I didn't get as many girls as I thought I would playing this so I'm putting it up for sale.	$30	frankie	Sell	2792 Ste. Catherine Ouest Montreal Quebec Canada L0N 2G1	Edit Delete
selling stun gun	Zap zap watchin' mother truckers go flat on their back!	$40	totally-postal	Sell	2629 Merton Street Toronto Ontario Canada J3X 3K3	Edit Delete
buying durags	Trying to keep all the toxic avenger chemicals I use to straighten my hair from getting on my pillow at night.	$5	kangz-and-kweens	Buy	638 Eglinton Avenue Toronto Ontario Canada B4N 1S6	Edit Delete
looking for someone to plan my dog's birthday	My wife and I don't have children so we figured to fill the void in our life we'd just spoil our pets.	$100	freedum	Buy	4229 rue Garneau Quebec City Quebec Canada T4G 0A7	Edit Delete

4.2.4   Admin Console

Now we can see all the payments that have been managed by the system, we can also trigger all these payments to be sent to our backup, and go generate some reports about the system.

OCN Portal

Payment ID	Paying User ID	Rented Space ID	Amount	Card Number	Card Expiry Date	Card Security Code	Cardholder Name	Card Company	Card Type	Payment Date
11	my-life-is-survival-horror	1	$170	6978251547554178	2020-01-11	383	Wanda Walsh	American Express	Credit	2017-01-03 00:00:00
1	my-life-is-survival-horror	null	$10	0843065502988806	2020-01-01	178	Wanda Walsh	Visa	Credit	2017-01-04 00:00:00
12	frankie	3	$80	6955950112214111	2020-01-12	763	Connor MacBone	Discover	Credit	2017-01-04 00:00:00
2	not-a-drug-dealer	null	$50	5018754410750838	2020-01-02	805	Katherine Allen	MasterCard	Credit	2017-01-05 00:00:00
13	dark-messiah	5	$80	5202143370315456	2020-01-13	152	Dangus Dongus	Visa	Credit	2017-01-05 00:00:00
3	dark-messiah	null	$10	6806082066763681	2020-01-03	112	Kurt Hanson	American Express	Credit	2017-01-07 00:00:00
4	blood-and-bacon	null	$10	0442810600176467	2020-01-04	376	Ginger Larson	Discover	Credit	2017-01-08 00:00:00
5	prepare-to-dunk	null	$10	0177946722808477	2020-01-05	637	Adrian Jenkins	Visa	Credit	2017-01-10 00:00:00
6	serious-samson	null	$50	1224042967809802	2020-01-06	586	Shelly Howard	MasterCard	Credit	2017-01-11 00:00:00
7	fallout-isnt-that-great	null	$10	2417456979726711	2020-01-07	307	Elisa Christensen	American Express	Credit	2017-01-13 00:00:00
8	rocket-league-is-a-visual-novel	null	$50	9278570453372441	2020-01-08	739	Laurie Fox	Discover	Credit	2017-01-14 00:00:00
14	serious-samson	2	$90	1212500501131886	2020-01-21	960	Vanessa Herrera	Visa	Credit	2017-01-16 00:00:00
15	totally-postal	4	$90	6145214887837421	2020-01-22	584	Frankie Edgar	MasterCard	Credit	2017-01-17 00:00:00
16	serious-samson	6	$90	4104657558633889	2020-01-23	830	Vanessa Herrera	American Express	Credit	2017-01-18 00:00:00
9	aliens-vs-zimbabwe	null	$10	9449912989573880	2020-01-09	697	Jamie Newman	Visa	Credit	2017-01-19 00:00:00
10	aliens-vs-zimbabwe	null	$50	7311081348111520	2020-01-10	714	Glenn Davidson	MasterCard	Credit	2017-01-20 00:00:00

Send pending payments to external processing department

Generate a report

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4.2.5 Generate a report

Here we can generate one of the ten supported admin reports.

Here's the results of report 8, wow!

Select a province.. ▼

Get the daily revenue and number of transactions by given store manager (past 15 days)

Manager ID: [   ]

Get the store rent profitability SL-1 SL-4 on weekends or weekdays

List the types of items sold by each store in given province

Ontario ▼

List a given seller's upcoming 7 day delivery fees, and past 7 day fees

[   ]

Get information about administrators

Get information about buyers

Get information about managers

Get information about sellers

User ID	Email	Number of Buying Ads	Price of All Ads	Sum of All Payments
aliens-vs-zimbabwe	mthurn@optonline.net	2	$1020	$120
blood-and-bacon	aracne@outlook.com	1	$0	$10
freedum	smcnabb@verizon.net	1	$100	$0
kangz-and-kweens	dwheeler@gmail.com	1	$5	$0
my-life-is-survival-horror	uqmcolyv@mac.com	1	$40	$180
not-a-drug-dealer	preneel@yahoo.com	1	$20	$50
prepare-to-dunk	grdschl@yahoo.ca	1	$0	$10
probst-the-despoiler	jbryan@icloud.com	1	$1000000	$0
rocket-league-is-a-visual-novel	benits@comcast.net	1	$10	$50
sigurd566	meinkej@icloud.com	1	$0	$0
south-park-ruined-my-life	okroeger@outlook.com	1	$50	$0
teh-tom	sakusha@verizon.net	1	$10	$0

5 DDL Code

```sql
create table Users
(
  UserID varchar(63) not null,
  Password varchar(127) not null,
  UserType enum('Regular', 'StoreManager', 'Admin') not null
    ,
  MembershipPlan enum('Normal', 'Silver', 'Premium') not
    null default 'Normal',
  Phone varchar(20) not null,
  Email varchar(127) not null,
  AddressStreet varchar(255) not null,
  AddressCity enum('Montreal', 'Quebec_City', 'Toronto', '
    Ottawa') not null,
  AddressProvince enum('Quebec', 'Ontario') not null,
  AddressCountry varchar(63) not null,
  AddressPostalCode varchar(63) not null,
  primary key (UserID)
);

create table Ads
(
  AdID int not null auto_increment,
  PostingUserID varchar(63) not null,
  PostingDate date not null,
  DaysToPromote int not null default 0, /* == position */
  AdType enum('Buy', 'Sell') not null,
  Title varchar(255) not null,
  Description varchar(2047) not null,
  PriceInCADCents int,
  Category enum('Clothing', 'Books', 'BuySellElectronics', '
    MusicalInstruments', /* Buy and Sell */
                  'Tutors', 'EventPlanners', 'Photographers',
                    'PersonalTrainers', /* Services */
                  'RentElectronics', 'Car', 'Apartment', '
                    WeddingDresses', /* Rent */
                  'MenSeekingWomen', 'WomenSeekingMen', '
                    MenSeekingMen', 'WomenSeekingWomen') /*
                    Personals */
                  not null,
  primary key (AdID),
  foreign key (PostingUserID) references Users(UserID)
);
```

```sql
create table Images
(
  FilePath varchar(255) not null,
  AdID int not null,
  primary key (FilePath),
  foreign key (AdID) references Ads(AdID)
);

create table Stores
(
  StoreID int not null auto_increment,
  ManagerUserID varchar(63) not null,
  StoreName varchar(255) not null,
  StrategicLocation enum('SL1', 'SL2', 'SL3', 'SL4') not
      null,
  primary key (StoreID),
  foreign key (ManagerUserID) references Users(UserID)
);

create table RentedSpaces
(
  RentedSpaceID int not null auto_increment,
  AdID int not null,
  StoreID int not null,
  DateRented date not null,
  HoursRented tinyint not null,
  DeliveryServices bool not null,
  primary key (RentedSpaceID),
  foreign key (AdID) references Ads(AdID),
  foreign key (StoreID) references Stores(StoreID)
);

create table Payments
(
  PaymentID int not null auto_increment,
  PayingUserID varchar(63) not null,
  RentedSpaceID int, /* May be null in case of buying
      Promotion/Membership */
  AmountInCADCents int not null,
  CardNumber char(16) not null,
  CardExpiryDate date not null,
  CardSecurityCode char(3), /* May be null in case of debit
      payment */
  CardholderName varchar(127) not null,
```

```
    CardCompany enum('MasterCard', 'Visa', 'American_Express',
        'Discover'), /* May be null in case of debit payment
      */
    CardType enum('Debit', 'Credit') not null,
    PaymentDate datetime,
    primary key (PaymentID),
    foreign key (PayingUserID) references Users(UserID),
    foreign key (RentedSpaceID) references RentedSpaces(
        RentedSpaceID)
);


create table ExternalBackupPayments
(
    PaymentID int not null,
    PayingUserID varchar(63) not null,
    RentedSpaceID int, /* May be null in case of buying
        Promotion/Membership */
    AmountInCADCents int not null,
    CardNumber char(16) not null,
    CardExpiryDate date not null,
    CardSecurityCode char(3) not null,
    CardholderName varchar(127) not null,
    CardCompany enum('MasterCard', 'Visa', 'American_Express',
        'Discover') not null,
    CardType enum('Debit', 'Credit') not null,
    PaymentDate datetime,
    primary key (PaymentID),
    foreign key (PayingUserID) references Users(UserID),
    foreign key (RentedSpaceID) references RentedSpaces(
        RentedSpaceID)
);

create table Ratings
(
    RatingID int not null auto_increment,
    AdIDBeingRated int not null,
    UserIDRatingAd varchar(63) not null,
    Rating tinyint not null,
    primary key (RatingID),
    foreign key (AdIDBeingRated) references Ads(AdID),
    foreign key (UserIdRatingAd) references Users(UserID)
);

delimiter //
```

```
create trigger RejectPersonalSelling before insert on Ads
for each row
begin
   if new.AdType = 'Sell' and (new.Category = '
      MenSeekingWomen' or new.Category = 'WomenSeekingMen'
       or new.Category = 'MenSeekingMen' or new.Category = '
          WomenSeekingWomen') then
      signal sqlstate '45000' set message_text = "Can't sell 
         personals";
      end if;
end;//

create trigger RejectRating before insert on Ratings
for each row
begin
   if new.Rating < 1  or new.Rating > 5 then
      signal sqlstate '45000' set message_text = "Rating out 
         of range.";
      end if;
end;//

create trigger RejectRentedSpace before insert on
   RentedSpaces
for each row
begin
   if new.AdID is null or (select AdType from Ads where AdID
      = new.AdID) is null
                  or (select AdType from Ads where AdID = new.
                     AdID) = 'Buy' then
      signal sqlstate '45000' set message_text = "Rented 
         Spaces can only host sell ads.";
      end if;

   if (select sum(HoursRented) from RentedSpaces where
      DateRented = new.DateRented and StoreID = new.StoreID)
      + new.HoursRented > 8 then
      signal sqlstate '45000' set message_text = "Cannot 
         schedule a slot in a Store for more than 8 hours in a
          day.";
      end if;
end;//

create event BackupPayments
on schedule at '2017-11-30 11:00:00' + interval 1 day
```

```
do begin
    delete from ExternalBackupPayments;
    insert into ExternalBackupPayments
        select * from Payments;
end;//

create event DeleteOldAds
on schedule every 1 day
do begin

update Payments set RentedSpaceID = null
where RentedSpaceID in (
select RentedSpaceID
from Ads join Users on Ads.PostingUserID = Users.UserID
    join RentedSpaces on RentedSpaces.AdID = Ads.AdID
where DaysToPromote <= 0 and datediff(now(), adddate(
    PostingDate,
    if(MembershipPlan = 'Premuim', 30, if(MembershipPlan = '
        Silver', 14, 7)))) >= 0);

update ExternalBackupPayments set RentedSpaceID = null
where RentedSpaceID in (
select RentedSpaceID
from Ads join Users on Ads.PostingUserID = Users.UserID
    join RentedSpaces on RentedSpaces.AdID = Ads.AdID
where DaysToPromote <= 0 and datediff(now(), adddate(
    PostingDate,
    if(MembershipPlan = 'Premuim', 30, if(MembershipPlan = '
        Silver', 14, 7)))) >= 0);

delete from RentedSpaces
where AdID in (
select AdID
from Ads join Users on Ads.PostingUserID = Users.UserID
where DaysToPromote <= 0 and datediff(now(), adddate(
    PostingDate,
    if(MembershipPlan = 'Premuim', 30, if(MembershipPlan = '
        Silver', 14, 7)))) >= 0);

delete from Images
where AdID in (
select AdID
from Ads join Users on Ads.PostingUserID = Users.UserID
where DaysToPromote <= 0 and datediff(now(), adddate(
    PostingDate,
```

```
        if (MembershipPlan = 'Premuim', 30, if (MembershipPlan = '
            Silver', 14, 7)))) >= 0);

delete from Ratings
where AdIDBeingRated in (
select AdID
from Ads join Users on Ads.PostingUserID = Users.UserID
where DaysToPromote <= 0 and datediff(now(), adddate(
    PostingDate,
    if (MembershipPlan = 'Premuim', 30, if (MembershipPlan = '
        Silver', 14, 7)))) >= 0);

delete from Ads
where AdID in (
select AdID
from Ads join Users on Ads.PostingUserID = Users.UserID
where DaysToPromote <= 0 and datediff(now(), adddate(
    PostingDate,
    if (MembershipPlan = 'Premuim', 30, if (MembershipPlan = '
        Silver', 14, 7)))) >= 0);

end;//

delimiter ;

create event PromotionDaysRemaining
on schedule every 1 day
do update Ads set DaysToPromote = DaysToPromote − 1
where DaysToPromote > 0;
```

6 DML Code

```
INSERT INTO `Users` VALUES ( 'aliens-vs-zimbabwe' , 'lol20' , '
    Regular' , 'Normal' , '5790377231' , 'mthurn@optonline.net' , '
    4328 Carling Avenue' , 'Ottawa' , 'Ontario' , 'Canada' , 'L3K 1S4
    ') ,( 'blood-and-bacon' , 'lol8' , 'Regular' , 'Normal' , '
    6343070990' , 'aracne@outlook.com' , '389 Front Street' , '
    Toronto' , 'Ontario' , 'Canada' , 'A2B 0L3') ,( 'borderline-
    stupidity' , 'lol19' , 'Admin' , 'Normal' , '6199980468' , '
    hellfire@sbcglobal.net' , '3629 Carling Avenue' , 'Ottawa' , '
    Ontario' , 'Canada' , 'B3T 2H8') ,( 'dark-messiah' , 'lol7' , '
    Regular' , 'Silver' , '1349352018' , 'hahsler@hotmail.com' , '
    4748 Borough Drive' , 'Toronto' , 'Ontario' , 'Canada' , 'K2G 1W0
    ') ,( 'fallout-isnt-that-great' , 'lol13' , 'Regular' , 'Premium'
    , '1318377598' , 'gmcgath@att.net' , '4167 rue Garneau' , '
    Quebec City' , 'Quebec' , 'Canada' , 'T4E 3Y6') ,( 'frankie' , '
    lol2' , 'Regular' , 'Silver' , '6323696437' , 'dwheeler@verizon.
    net' , '2792 Ste. Catherine Ouest' , 'Montreal' , 'Quebec' , '
    Canada' , 'L0N 2G1') ,( 'freedum' , 'lol12' , 'Regular' , 'Normal',
    '1153160368' , 'smcnabb@verizon.net' , '4229 rue Garneau' , '
    Quebec City' , 'Quebec' , 'Canada' , 'T4G 0A7') ,( 'jotun-lover23
    ' , 'lol3' , 'StoreManager' , 'Silver' , '7752212672' , '
    phish@hotmail.com' , '3684 rue Levy' , 'Montreal' , 'Quebec' , '
    Canada' , 'T7N 1W3') ,( 'kangz-and-kweens' , 'lol9' , 'Regular' , '
    Normal' , '1252166292' , 'dwheeler@gmail.com' , '638 Eglinton
    Avenue' , 'Toronto' , 'Ontario' , 'Canada' , 'B4N 1S6') ,( 'my-life
    -is-survival-horror' , 'lol4' , 'Regular' , 'Normal' , '
    3783855441' , 'uqmcolyv@mac.com' , '1983 Rene-Levesque Blvd' ,
    'Montreal' , 'Quebec' , 'Canada' , 'J5X 2P4') ,( 'not-a-drug-
    dealer' , 'lol5' , 'Regular' , 'Normal' , '4903790127' , '
    preneel@yahoo.com' , '909 Papineau Avenue' , 'Montreal' , '
    Quebec' , 'Canada' , 'L8E 2V1') ,( 'prepare-to-dunk' , 'lol10' , '
    Regular' , 'Normal' , '7612920545' , 'grdschl@yahoo.ca' , '673
    Halsey Avenue' , 'Toronto' , 'Ontario' , 'Canada' , 'G5X 3X1') ,( '
    probst-the-despoiler' , 'lol18' , 'Regular' , 'Normal' , '
    3747326813' , 'jbryan@icloud.com' , '3771 Carling Avenue' , '
    Ottawa' , 'Ontario' , 'Canada' , 'P0P 3E6') ,( 'rocket-league-is-
    a-visual-novel' , 'lol14' , 'Regular' , 'Normal' , '5137425883' , '
    benits@comcast.net' , '3820 rue Garneau' , 'Quebec City' , '
    Quebec' , 'Canada' , 'L4R 1A1') ,( 'serious-samson' , 'lol11' , '
    Regular' , 'Normal' , '5905549814' , 'notaprguy@sbcglobal.net' ,
    '2586 Boulevard Cremazie' , 'Quebec City' , 'Quebec' , 'Canada'
    , 'J8G 2L6') ,( 'sigurd566' , 'lol17' , 'Regular' , 'Normal' , '
    4632144313' , 'meinkej@icloud.com' , '847 MacLaren Street' , '
    Ottawa' , 'Ontario' , 'Canada' , 'G0R 2Z0') ,( 'south-park-ruined
```

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−my−life ' , 'lol15 ' , 'Regular ' , 'Normal ' , '2178303331 ' , '
okroeger@outlook .com ' , '2133 Boulevard Cremazie ' , 'Quebec
City ' , 'Quebec ' , 'Canada ' , 'B1E 3E7 ') ,( 'tamy2132 ' , 'lol16 ' , '
StoreManager ' , 'Premium ' , '7103595143 ' , 'noticias@mac .com ' , '
1177 Montreal Road ' , 'Ottawa ' , 'Ontario ' , 'Canada ' , 'N7G 2B3 '
) ,( 'teh−tom ' , 'lol1 ' , 'Regular ' , 'Normal ' , '3661343228 ' , '
sakusha@verizon . net ' , '3043 Sherbrooke Ouest ' , 'Montreal ' , '
Quebec ' , 'Canada ' , 'E6K 1Y2 ') ,( 'totally −postal ' , 'lol6 ' , '
Regular ' , 'Premium ' , '6848914545 ' , 'howler@verizon . net ' , '
2629 Merton Street ' , 'Toronto ' , 'Ontario ' , 'Canada ' , 'J3X 3K3
') ;
INSERT INTO `Ads` VALUES (1 , 'teh−tom ' , '2017−01−01 ' ,0 , 'Buy ' , '
buying a copy of 1984 ' , 'Need a copy of this so I can put
it on my shelf and not read it . ' ,1000 , 'Books ') ,(2 , '
frankie ' , '2017−01−02 ' ,0 , 'Sell ' , 'selling my guitar ' , 'I
didn\ 't get as many girls as I thought I would playing
this so I\ 'm putting it up for sale . ' ,3000 , '
MusicalInstruments ') ,(3 , 'my−life −is−survival−horror ' , '
2017−01−03 ' ,58 , 'Sell ' , 'renting white vans ' , 'These are top
of the line vans that we have acquired through police
auctions . Tinted windows , extremely secured to prevent
breaking−in/escaping . You ain\ 't gonna find vans like
these anywhere ! ' ,5000 , 'Car ') ,(4 , 'my−life −is−survival−
horror ' , '2017−01−04 ' ,5 , 'Buy ' , 'need a tutor for my son ' , '
He\ 's failed gym class for the third time , please someone
help ! ' ,2000 , 'Tutors ') ,(5 , 'not−a−drug−dealer ' , '2017−01−05
' ,28 , 'Buy ' , 'buying books on horticulture ' , 'My friend
Ricky is an aspiring herbalist/shaman and really needs
these books . Preferably at a grade−10 reading level or
lower . ' ,2000 , 'Books ') ,(6 , 'totally −postal ' , '2017−01−06 ' ,0 ,
'Sell ' , 'selling stun gun ' , 'Zap zap watchin\ ' mother
truckers go flat on their back ! ' ,4000 , 'BuySellElectronics
') ,(7 , 'dark−messiah ' , '2017−01−07 ' ,5 , 'Sell ' , 'selling
fedora collection ' , 'Over 1000 fedoras for classy
gentlemen like myself :^) − all in good condition , only
partially tipped . ' ,2000 , 'Clothing ') ,(8 , 'blood−and−bacon ' ,
'2017−01−08 ' ,28 , 'Buy ' , 'looking for love 35/m ' , 'Looking
for something great in the worst place ! ' ,NULL, '
MenSeekingWomen ') ,(9 , 'kangz−and−kweens ' , '2017−01−09 ' ,0 , '
Buy ' , 'buying durags ' , 'Trying to keep all the toxic
avenger chemicals I use to straighten my hair from
getting on my pillow at night . ' ,500 , 'Clothing ') ,(10 , '
prepare−to−dunk ' , '2017−01−10 ' ,5 , 'Buy ' , 'looking for
financial servitude 39/m ' , 'I have money and no self −
respect . ' ,NULL, 'MenSeekingWomen ') ,(11 , 'serious −samson ' , '
```

2017−01−11 ',28,'Sell','selling copies of windows 98',' Nostalgia has never been so... Slow.',200,' BuySellElectronics'),(12,'freedum','2017−01−12',0,'Buy',' looking for someone to plan my dog\'s␣birthday','My␣wife␣ and␣I␣don\'t have children so we figured to fill the void in our life we\'d␣just␣spoil␣our␣pets.',10000,' EventPlanners'),(13,'fallout−isnt−that−great','2017−01−13 ',5,'Sell','2␣1/2␣for␣rent,␣kinda␣smells','Someone␣ unloaded␣a␣chicken−milk␣bomb␣somewhere␣in␣the␣apartment,␣ but␣it\'s fully furnished!',40000,'Apartment'),(14,' rocket−league−is−a−visual−novel','2017−01−14',28,'Buy',' buying books **on** how to git gud','HOW DO I PVP?!',1000,' Books'),(15,'south−park−ruined−my−life','2017−01−15',0,' Buy','looking for a photographer','Hiring a professional photographer for the launch of my website goat−se.com to promote the goat summer extravaganza!',5000,' Photographers'),(16,'serious−samson','2017−01−16',58,' Sell','we sell used clothing','Bed bugs **and** staph infections sold separately!',1000,'Clothing'),(17,' sigurd566','2017−01−17',0,'Buy','looking for a fellow finger painter','Looking for a platonic relationship **where** we can finger paint **using only** pink jellybeans.', NULL,'WomenSeekingWomen'),(18,'probst−the−despoiler',' 2017−01−18',0,'Buy','looking for a computer architecture book that isn\'t␣crap','I\'m **not** going to insult your intelligence **by** telling you what book I want because the **only** acceptable book **on** this topic would have me **as** an author!... Even though I don\'t␣write␣anything,␣ever.' ,100000000,'Books'),(19,'aliens−vs−zimbabwe','2017−01−19' ,5,'Buy','looking␣to␣rent␣a␣wedding␣dress','Going␣to␣need ␣it␣for␣a␣couple␣of␣nights,␣my␣waifu␣and␣I␣are␣ celebrating␣the␣first␣time␣I␣watched␣Moshi␣Moshi␣Desu␣ Desu␣Adventure.',50000,'WeddingDresses'),(20,'aliens−vs− zimbabwe','2017−01−20',28,'Buy','buying␣life−size␣anime␣ girl','Must␣be␣self−cleaning␣and␣non−judgemental.',1000,' BuySellElectronics');
INSERT INTO `Images` VALUES ('3.jpg',3),('4.jpg',4),('5.jpg' ,5),('7.jpg',7),('8.jpg',8),('10.jpg',10),('11.jpg',11),('13.gif',13),('14.jpg',14),('16.jpg',16),('19.jpg',19),(' 20.jpg',20);
INSERT INTO `Stores` VALUES (1,'jotun−lover23','Warehouse␣1' ,'SL1'),(2,'tamy2132','Warehouse␣2','SL2'),(3,'jotun− lover23','Warehouse␣3','SL3'),(4,'tamy2132','Warehouse␣4' ,'SL4'),(5,'jotun−lover23','Warehouse␣5','SL1'),(6,' tamy2132','Warehouse␣6','SL2'),(7,'jotun−lover23','

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          Warehouse_7', 'SL3'),(8, 'tamy2132', 'Warehouse_8', 'SL4')
     ,(9, 'jotun-lover23', 'Warehouse_9', 'SL1'),(10, 'tamy2132','
     Warehouse_10', 'SL2'),(11, 'jotun-lover23', 'Warehouse_11','
     SL3'),(12, 'tamy2132', 'Warehouse_12', 'SL4'),(13, 'jotun-
     lover23', 'Warehouse_13', 'SL1'),(14, 'tamy2132', 'Warehouse_
     14', 'SL2'),(15, 'jotun-lover23', 'Warehouse_15', 'SL3'),(16,
     'tamy2132', 'Warehouse_16', 'SL4'),(17, 'jotun-lover23','
     Warehouse_17', 'SL1'),(18, 'tamy2132', 'Warehouse_18', 'SL2')
     ,(19, 'jotun-lover23', 'Warehouse_19', 'SL3'),(20, 'tamy2132'
     ,'Warehouse_20', 'SL4');
INSERT INTO `RentedSpaces` VALUES (1,3,1, '2017-01-03',8,0)
     ,(2,16,2, '2017-01-16',6,1),(5,7,5, '2017-01-05',8,0)
     ,(6,11,6, '2017-01-18',6,1);
INSERT INTO `Payments` VALUES (1, 'my-life-is-survival-horror
     ',NULL,1000, '0843065502988806', '2020-01-01', '178', 'Wanda_
     Walsh', 'Visa', 'Credit', '2017-01-04_00:00:00'),(2, 'not-a-
     drug-dealer',NULL,5000, '5018754410750838', '2020-01-02','
     805', 'Katherine_Allen', 'MasterCard', 'Credit', '2017-01-05_
     00:00:00'),(3, 'dark-messiah',NULL,1000, '6806082066763681'
     ,'2020-01-03', '112', 'Kurt_Hanson', 'American_Express','
     Credit', '2017-01-07_00:00:00'),(4, 'blood-and-bacon',NULL
     ,1000, '0442810600176467', '2020-01-04', '376', 'Ginger_
     Larson', 'Discover', 'Credit', '2017-01-08_00:00:00'),(5,'
     prepare-to-dunk',NULL,1000, '0177946722808477', '2020-01-05
     ', '637', 'Adrian_Jenkins', 'Visa', 'Credit', '2017-01-10_
     00:00:00'),(6, 'serious-samson',NULL,5000,'
     1224042967809802', '2020-01-06', '586', 'Shelly_Howard','
     MasterCard', 'Credit', '2017-01-11_00:00:00'),(7, 'fallout-
     isnt-that-great',NULL,1000, '2417456979726711', '2020-01-07
     ', '307', 'Elisa_Christensen', 'American_Express', 'Credit','
     2017-01-13_00:00:00'),(8, 'rocket-league-is-a-visual-novel
     ',NULL,5000, '9278570453372441', '2020-01-08', '739', 'Laurie
     _Fox', 'Discover', 'Credit', '2017-01-14_00:00:00'),(9,'
     aliens-vs-zimbabwe',NULL,1000, '9449912989573880','
     2020-01-09', '697', 'Jamie_Newman', 'Visa', 'Credit','
     2017-01-19_00:00:00'),(10, 'aliens-vs-zimbabwe',NULL,5000,
     '7311081348111520', '2020-01-10', '714', 'Glenn_Davidson','
     MasterCard', 'Credit', '2017-01-20_00:00:00'),(11, 'my-life-
     is-survival-horror',1,17000, '6978251547554178','
     2020-01-11', '383', 'Wanda_Walsh', 'American_Express','
     Credit', '2017-01-03_00:00:00'),(12, 'frankie',NULL,8000,'
     6955950112214111', '2020-01-12', '763', 'Connor_MacBone','
     Discover', 'Credit', '2017-01-04_00:00:00'),(13, 'dark-
     messiah',5,8000, '5202143370315456', '2020-01-13', '152','
     Dangus_Dongus', 'Visa', 'Credit', '2017-01-05_00:00:00')
```

```
        ,(14,'serious-samson',2,9000,'1212500501131886','
    2020-01-21','960','Vanessa_Herrera','Visa','Credit','
    2017-01-16_00:00:00'),(15,'totally-postal',NULL,9000,'
    6145214887837421','2020-01-22','584','Frankie_Edgar','
    MasterCard','Credit','2017-01-17_00:00:00'),(16,'serious-
    samson',6,9000,'4104657558633889','2020-01-23','830','
    Vanessa_Herrera','American_Express','Credit','2017-01-18_
    00:00:00');
INSERT INTO `Ratings` VALUES (3,3,'kangz-and-kweens',5)
    ,(4,4,'kangz-and-kweens',5),(5,5,'kangz-and-kweens',5)
    ,(7,7,'kangz-and-kweens',5),(8,8,'kangz-and-kweens',5)
    ,(10,10,'kangz-and-kweens',5),(11,11,'kangz-and-kweens'
    ,5),(13,13,'kangz-and-kweens',5),(14,14,'kangz-and-kweens
    ',5),(16,16,'kangz-and-kweens',5),(19,19,'kangz-and-
    kweens',5),(20,20,'kangz-and-kweens',5);
```

7   Contributions

Adriel Fabella
Role: Back-end Developer
Primary Responsibilities: Design/implementation of the application's back-end features related to integrating the database with the front-end

Loïc Huss
Role: Back-end/Database Developer
Primary Responsibilities: Implementation of admin report and general functionality queries for the back-end of the application

Colin Greczkowski
Role: Front/Back-end Developer
Primary Responsibilities: Design/implementation of the application's front-end features and overall UI/UX, implementation of the back-end features

Nicholaos Mouzourakis
Role: Database Developer
Primary Responsibilities: Design of the ER model and relational schema, design/implementation of the MySQL database and triggers/events

Alexandre Pelletier
Role: Manager, Back-end/Database Developer
Primary Responsibilities: Managing and supporting various team efforts, implementation of the MySQL database, implementation of general functionality queries, documentation