COMP–421 Database Systems, Winter 2019
Project 3: Writing your Application

SAAS Shoe Store Database
Group 37

Question 1:

For the stored procedure, we decided to include a functionality where the admin can reduce the prices of a product if they are above a given price x by z percent where x and z are both the inputs to the function. You can see the function below:

```
1  CREATE OR REPLACE FUNCTION avgPrice(productPrice float, discount float)
2  RETURNS text
3  LANGUAGE plpgsql
4  AS $$
5  DECLARE
6   modelsnumbers TEXT DEFAULT 'The prices were changed for these models: ';
7   currRecord RECORD;
8   currRow CURSOR
9   FOR
10  Select model_id, price
11  FROM models;
12 BEGIN
13  OPEN  currRow;
14
15  LOOP
16        FETCH currRow INTO currRecord;
17        EXIT WHEN NOT FOUND;
18
19        IF currRecord.price >= productPrice THEN
20             UPDATE models
21                  SET price = price - price*(discount)
22                  WHERE model_id = currRecord.model_id;
```

From the script above, we can see that the price for the model and the discount percent are taken in as parameters. There is a local variable that keeps a track of all the models whose price will be changed. The cursor goes through all the records in the models table and checks if the condition is met. If the condition is met, the price is changed and the model number is added to the text that will be returned.

In the screenshot below, we can see the models table before calling the function. After which, the function is called with productPrice of 100 and discount of 10% which is

expressed as 0.1. After the function is executed, we see that the text is returned which
shows all the model_ids where the prices have been changed. The table is displayed after

```
cs421=> select * from models;
 model_id | gender |         name           |                description                | price
----------+--------+------------------------+-------------------------------------------+-------
     8770 | M      | White shoes            | White casual shoes with a zipper          |    45
     8771 | M      | White Smoke shoes      | Shoes with three stripes on the side      |   100
     8772 | M      | Nike Soccer shoes      | Nike red cleat                            |    65
     8773 | F      | NB Running shoes       | NB running shoes multicolor               |    89
     8774 | M      | Brown Dress Shoes      | Brown dress shoes with no lace            |    78
     8775 | M      | Formal Brown Shoes     | Formal brown shoes with lace              |    90
     8777 | M      | Comfortable gray shoe  | Speckled gray shoe with stripes           |   125
     8778 | M      | Multi-color athletic shoe | Vibrant shoe for sports                |    99
     8779 | F      | Casual boot shoe       | Perfect for any terrain                   |   125
     8781 | F      | Shiny shoes            | Shimmering casual shoes                   |    99
     8776 | M      | Casual White shoe      | High-rise vintage shoe with brown tread   |   150
     8780 | F      | Elegant womens heels   | High heels for a special occasion         |   199
(12 rows)

cs421=> SELECT avgPrice(100, 0.1);
                      avgprice
-----------------------------------------------------------------
 The prices were changed for these models:  8771 8777 8779 8776 8780
(1 row)

cs421=> select * from models;
 model_id | gender |         name           |                description                | price
----------+--------+------------------------+-------------------------------------------+-------
     8770 | M      | White shoes            | White casual shoes with a zipper          |    45
     8772 | M      | Nike Soccer shoes      | Nike red cleat                            |    65
     8773 | F      | NB Running shoes       | NB running shoes multicolor               |    89
     8774 | M      | Brown Dress Shoes      | Brown dress shoes with no lace            |    78
     8775 | M      | Formal Brown Shoes     | Formal brown shoes with lace              |    90
     8778 | M      | Multi-color athletic shoe | Vibrant shoe for sports                |    99
     8781 | F      | Shiny shoes            | Shimmering casual shoes                   |    99
     8771 | M      | White Smoke shoes      | Shoes with three stripes on the side      |    90
     8777 | M      | Comfortable gray shoe  | Speckled gray shoe with stripes           | 112.5
     8779 | F      | Casual boot shoe       | Perfect for any terrain                   | 112.5
     8776 | M      | Casual White shoe      | High-rise vintage shoe with brown tread   |   135
     8780 | F      | Elegant womens heels   | High heels for a special occasion         | 179.1
(12 rows)
```

the function has been run and we see the difference in the prices.

Question 2:

Attached is our CLI Java application. To run:
java -jar saas-1.0-SNAPSHOT.jar

An example login is:
Username: emily
Password: iudv3

When logging into the shoe store, the user is prompted with a username and password.

```
Welcome to the SaaS Shoestore!
Please log in:
Username: emily
Password: iudv3
Authenticated!

What would you like to do? Pick a letter from the options below:
 (a) Browse products
 (b) Cart
 (c) Purchase cart items
 (d) Account settings
 (e) Quit
 input: █
```

When selecting the option a), you are met with an option to browse products.

```
What would you like to do? Pick a letter from the options below:
 (a) Browse products
 (b) Cart
 (c) Purchase cart items
 (d) Account settings
 (e) Quit
 input: a

Selcet one of the following options:
 (a) Make a search / view products
 (b) See a product review
 (c) Add item to cart
 (d) Go back to main menu
 input: █
```

When making a search, you are prompted to enter a way of searching the products available.

```
Selcet one of the following options:
 (a) Make a search / view products
 (b) See a product review
 (c) Add item to cart
 (d) Go back to main menu
 input:  a
Please enter the gender: (M/F):M
Search by ...
 (a) color
 (b) size
 (c) model
 (d) size and model
 (e) none (see all products)
 input: a

color_id: 169169169 |
color_id: 192192192 |
color_id: 220220220 |
color_id: 245245245 |
color_id: 255255255 |
color_id: 272155255 |
color_id: 312211232 |
please enter a color from the above:
```

One can also find the reviews for products in the store.

```
Selcet one of the following options:
 (a) Make a search / view products
 (b) See a product review
 (c) Add item to cart
 (d) Go back to main menu
 input:  b

model_id: 8770 |
model_id: 8771 |
model_id: 8772 |
model_id: 8773 |
model_id: 8774 |
model_id: 8775 |
 Enter 'n' for next page or 's' to stop browsing:  s

Enter a model id:8770

email: saleh.bakhit@mail.mcgill.ca |  comment_: "The shoe fit splendidly." |  rating: 5 |
No more items
 Do you want to see the reviews of another product? (Y/N):
```

To find the product ID of a relevant item, can do this as shown:

```
Please enter the gender: (M/F):M
Search by ...
 (a) color
 (b) size
 (c) model
 (d) size and model
 (e) none (see all products)
 input: b

size_: 9 |
size_: 10 |
size_: 11 |
please enter a size from the above: 9

product_id: 2133 |  model_id: 8776 |  gender: M |  status: Available |  size_: 9 |  price: 135 |  description: Hi
gh-rise vintage shoe with brown tread |
No more items

Selcet one of the following options:
 (a) Make a search / view products
 (b) See a product review
 (c) Add item to cart
 (d) Go back to main menu
 input:
```

This can then be added into the cart as such:

```
size_: 10 |
size_: 11 |
please enter a size from the above: 9

product_id: 2133 |  model_id: 8776 |  gender: M |  status: Available |  size_: 9 |  price: 135 |  description: Hi
gh-rise vintage shoe with brown tread |
No more items

Selcet one of the following options:
 (a) Make a search / view products
 (b) See a product review
 (c) Add item to cart
 (d) Go back to main menu
 input:  c
Enter product id:2133
Item has been added to cart, do you want to add another one? (Y/N): N
```

After returning to the main menu, one can view cart (b), seeing the carted items.

```
 (a) Make a search / view products
 (b) See a product review
 (c) Add item to cart
 (d) Go back to main menu
 input:  d

What would you like to do? Pick a letter from the options below:
 (a) Browse products
 (b) Cart
 (c) Purchase cart items
 (d) Account settings
 (e) Quit
 input: b
Here's the items that you have currently in your cart:

product_id: 2133 |  model_id: 8776 |  gender: M |  size_: 9 |
```

When purchasing an item, one can choose from various payment methods (uploaded credit cards), or can add a new credit card.

```
What would you like to do? Pick a letter from the options below:
 (a) Browse products
 (b) Cart
 (c) Purchase cart items
 (d) Account settings
 (e) Quit
 input: c
Here's a list of your credit cards:
card_number: 6845768947645876 |  email: emily.rando@mail.mcgill.ca   |  name: erando |  address: 3477 Drummond St, H2X 2G8, Montreal, Q, Canada |  cvv2: 248 |  postal_code: H1B5W3 |
card_number: 1234123443211234 |  email: emily.rando@mail.mcgill.ca   |  name: hmidou king |  address: 3465 rue de la Montagne |  cvv2: 145 |  postal_code: H3V1Y5 |
card_number: 1234567899874561 |  email: emily.rando@mail.mcgill.ca   |  name: sami king  |  address:  4356 rue lafayette, Montreal ,Q, Canada |  cvv2: 157 |  postal_code: H3G4Y8 |
card_number: 1234512345654321 |  email: emily.rando@mail.mcgill.ca   |  name: mahdi jamoussi |  address: 3451 sherbrook, Montreal, Q, Canada |  cvv2: 589 |  postal_code: H2X1J7 |
No more items
Enter credit card number from the list above or enter 'n' to add a new credit card:
```

After selecting an existing credit card:

```
Here's a list of your credit cards:
card_number: 6845768947645876 |  email: emily.rando@mail.mcgill.ca   |  name: erando |  address: 3477 Drummond St, H2X 2G8, Montreal, Q, Canada |  cvv2: 248 |  postal_code: H1B5W3 |
card_number: 1234123443211234 |  email: emily.rando@mail.mcgill.ca   |  name: hmidou king |  address: 3465 rue de la Montagne |  cvv2: 145 |  postal_code: H3V1Y5 |
card_number: 1234567899874561 |  email: emily.rando@mail.mcgill.ca   |  name: sami king  |  address:  4356 rue lafayette, Montreal ,Q, Canada |  cvv2: 157 |  postal_code: H3G4Y8 |
card_number: 1234512345654321 |  email: emily.rando@mail.mcgill.ca   |  name: mahdi jamoussi |  address: 3451 sherbrook, Montreal, Q, Canada |  cvv2: 589 |  postal_code: H2X1J7 |
No more items
Enter credit card number from the list above or enter 'n' to add a new credit card:6845768947645876
Purchase successfully completed.
```

This purchase has now been completed. One can see this by returning to the main menu, pressing d) for account settings, and navigating to b) to view invoices. We can choose to see invoice details, and can see that our new item (with product_id 2133) has been purchased.

```
Select one of the following options:
 (a) Change account information
 (b) Old invoices
 (c) Add a review
 (d) Payment method
 (e) Go back to main menu
 input: b
Here is a list of your old invoices:

invoice_id: 683 |  total: 473 |  date_time: 2019-03-24 00:00:00 |  card_number: 1234123443211234 |  email: emily.rando@mail.mcgill.ca  |  shipment_id: 91 |
invoice_id: 684 |  total: 295 |  date_time: 2019-03-24 00:00:00 |  card_number: 1234512345654321 |  email: emily.rando@mail.mcgill.ca  |  shipment_id: 92 |
invoice_id: 685 |  total: 200 |  date_time: 2019-03-25 00:00:00 |  card_number: 1234567899874561 |  email: emily.rando@mail.mcgill.ca  |  shipment_id: 93 |
invoice_id: 686 |  total: 135 |  date_time: 2019-03-25 00:00:00 |  card_number: 6845768947645876 |  email: emily.rando@mail.mcgill.ca  |  shipment_id: 94 |
No more items
To see the details of a perticular invoice enter it's id or enter 'c' to got back: 686

product_id: 2133 |  model_id: 8776 |  gender: M |  status: Out of Stock |  size_: 9 |  price: 135 |  description: High-rise vintage shoe with brown tread |
Do you want to see the details of another invoice? (Y/N):
```

When selecting d, it gives account settings options

```
$ java -jar saas-1.0-SNAPSHOT.jar
Welcome to the SaaS Shoestore!
Please log in:
Username: emily
Password: iudv3
Authenticated!

What would you like to do? Pick a letter from the options below:
 (a) Browse products
 (b) Cart
 (c) Purchase cart items
 (d) Account settings
 (e) Quit
 input: d
```

The following options are possible to change account information

```
Select one of the following options:
 (a) Change account information
 (b) Old invoices
 (c) Add a review
 (d) Payment method
 (e) Go back to main menu
 input: a
Select one of the following options:
 (a) change password
 (b) change address
 (c) change gender
 (d) cancel
 input: d
```

Here, we add a review and view it

```
Select one of the following options:
 (a) Change account information
 (b) Old invoices
 (c) Add a review
 (d) Payment method
 (e) Go back to main menu
 input: c

Select one of the following options
 (a) add review
 (b) Go back to account
 input: a
Here is a list of your old invoices:

invoice_id: 683 |  total: 473 |  date_time: 2019-03-24 00:00:00 |  card_number: 1234123443211234 |  email: emily.rando@mail.mcgill.ca  |  shipment_id: 91 |
invoice_id: 684 |  total: 295 |  date_time: 2019-03-24 00:00:00 |  card_number: 1234512345654321 |  email: emily.rando@mail.mcgill.ca  |  shipment_id: 92 |
invoice_id: 685 |  total: 200 |  date_time: 2019-03-25 00:00:00 |  card_number: 1234567899874561 |  email: emily.rando@mail.mcgill.ca  |  shipment_id: 93 |
No more items
To see the details of a perticular invoice enter it's id or enter 'c' to got back: 683

product_id: 1244 |  model_id: 8781 |  gender: F |  status: Out of stock |  size_: 8 |  price: 99 |  description: Shimmering casual shoes |
product_id: 1245 |  model_id: 8781 |  gender: F |  status: Out of stock |  size_: 7 |  price: 99 |  description: Shimmering casual shoes |
product_id: 2135 |  model_id: 8776 |  gender: M |  status: Out of stock |  size_: 8.5 |  price: 135 |  description: High-rise vintage shoe with brown tread |
product_id: 2140 |  model_id: 8777 |  gender: M |  status: Out of stock |  size_: 10 |  price: 112.5 |  description: Speckled gray shoe with stripes |
Do you want to see the details of another invoice? (Y/N): N
Enter the model id  that you want to review from the above list:
8781
Enter your review:
test review
Enter the rating:
5
Review successfully submitted.

Select one of the following options:
 (a) Change account information
 (b) Old invoices
 (c) Add a review
 (d) Payment method
 (e) Go back to main menu
 input: c

Select one of the following options
 (a) add review
 (b) Go back to account
 input: b

Select one of the following options:
 (a) Change account information
 (b) Old invoices
 (c) Add a review
 (d) Payment method
 (e) Go back to main menu
 input: d
```

Here, we view our old invoices of previous purchases as well as invoice items

```
Select one of the following options:
 (a) Change account information
 (b) Old invoices
 (c) Add a review
 (d) Payment method
 (e) Go back to main menu
 input: b
Here is a list of your old invoices:

invoice_id: 683 |  total: 473 |  date_time: 2019-03-24 00:00:00 |  card_number: 1234123443211234 |  email: emily.rando@mail.mcgill.ca  |  shipment_id: 91 |
invoice_id: 684 |  total: 295 |  date_time: 2019-03-24 00:00:00 |  card_number: 1234512345654321 |  email: emily.rando@mail.mcgill.ca  |  shipment_id: 92 |
invoice_id: 685 |  total: 200 |  date_time: 2019-03-25 00:00:00 |  card_number: 1234567899874561 |  email: emily.rando@mail.mcgill.ca  |  shipment_id: 93 |
No more items
To see the details of a perticular invoice enter it's id or enter 'c' to got back: 683

product_id: 1244 |  model_id: 8781 |  gender: F |  status: Out of stock |  size_: 8 |  price: 99 |  description: Shimmering casual shoes |
product_id: 1245 |  model_id: 8781 |  gender: F |  status: Out of stock |  size_: 7 |  price: 99 |  description: Shimmering casual shoes |
product_id: 2135 |  model_id: 8776 |  gender: M |  status: Out of stock |  size_: 8.5 |  price: 135 |  description: High-rise vintage shoe with brown tread |
product_id: 2140 |  model_id: 8777 |  gender: M |  status: Out of stock |  size_: 10 |  price: 112.5 |  description: Speckled gray shoe with stripes |
Do you want to see the details of another invoice? (Y/N): N
```

Here, view credit card information and check the review we added earlier

```
What would you like to do? Pick a letter from the options below:
 (a) View your credit cards
 (b) Add a credit card
 (c) go back
 input: c

Select one of the following options:
 (a) Change account information
 (b) Old invoices
 (c) Add a review
 (d) Payment method
 (e) Go back to main menu
 input: e

What would you like to do? Pick a letter from the options below:
 (a) Browse products
 (b) Cart
 (c) Purchase cart items
 (d) Account settings
 (e) Quit
 input: a

Selcet one of the following options:
 (a) Make a search / view products
 (b) See a product review
 (c) Add item to cart
 (d) Go back to main menu
 input:  b

model_id: 8770 |
model_id: 8771 |
model_id: 8772 |
model_id: 8773 |
model_id: 8774 |
model_id: 8775 |
 Enter 'n' for next page or 's' to stop browsing:  s

Enter a model id:8781

email: emily.rando@mail.mcgill.ca  |  comment_: test review |  rating: 5 |
No more items
 Do you want to see the reviews of another product? (Y/N): N

Selcet one of the following options:
 (a) Make a search / view products
 (b) See a product review
 (c) Add item to cart
 (d) Go back to main menu
 input:  d
```

Here, we check account settings and quit

```
What would you like to do? Pick a letter from the options below:
 (a) Browse products
 (b) Cart
 (c) Purchase cart items
 (d) Account settings
 (e) Quit
 input: d

Select one of the following options:
 (a) Change account information
 (b) Old invoices
 (c) Add a review
 (d) Payment method
 (e) Go back to main menu
 input: d

What would you like to do? Pick a letter from the options below:
 (a) View your credit cards
 (b) Add a credit card
 (c) go back
 input: a
Here's a list of your credit cards:
card_number: 6845768947645876 |  email: emily.rando@mail.mcgill.ca  |  name: erando |  address: 3477 Drummond St, H2X 2G8, Montreal, Q, Canada |  cvv2: 248 |  postal_code: H1B5W3 |
card_number: 1234123443211234 |  email: emily.rando@mail.mcgill.ca  |  name: hmidou king |  address: 3465 rue de la Montagne |  cvv2: 145 |  postal_code: H3V1Y5 |
card_number: 1234567899874561 |  email: emily.rando@mail.mcgill.ca  |  name: sami king  |  address:  4356 rue lafayette, Montreal ,Q, Canada |  cvv2: 157 |  postal_code: H3G4Y8 |
card_number: 1234512345654321 |  email: emily.rando@mail.mcgill.ca  |  name: mahdi jamoussi |  address: 3451 sherbrook, Montreal, Q, Canada |  cvv2: 589 |  postal_code: H2X1J7 |
No more items

What would you like to do? Pick a letter from the options below:
 (a) View your credit cards
 (b) Add a credit card
 (c) go back
 input: c

Select one of the following options:
 (a) Change account information
 (b) Old invoices
 (c) Add a review
 (d) Payment method
 (e) Go back to main menu
 input: e

What would you like to do? Pick a letter from the options below:
 (a) Browse products
 (b) Cart
 (c) Purchase cart items
 (d) Account settings
 (e) Quit
 input: e

Thank you for shopping at SAAS.
```

Question 3:

We added the index on the usernames of the application so that it is faster when users are trying to sign in. This is important because logins happen each time a user goes to interact with the database.
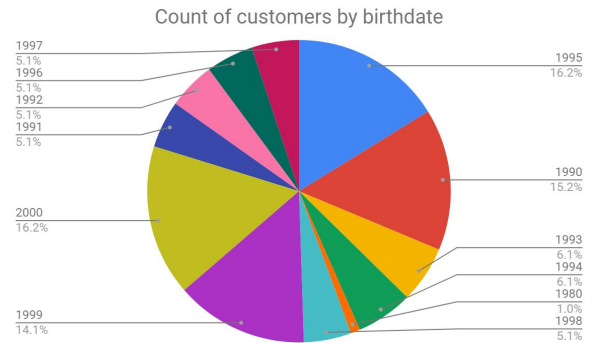
```
1 CREATE INDEX usernameIndex ON CUSTOMERS(username);
```

The second index was added on added on the sizes for all the shoes. This would make the looking up functionality based on sizes faster. Because users generally decide to look in their size first, this would expedite that process.

```
1 CREATE INDEX sizeIndex ON shoes(size_);
```

Question 4:

The first Data visualization we see below is the no of customers from their birth year. This kind of information is used by online stores to advertise similar products to the same age groups.

No of Customers vs their birthyear

Count of customers by birthdate

The second visualization that we see is the average rating for a shoe model. This data can be used to prioritize the what products to display on the first page of the online store, what items to order, etc.

Average rating per shoe model