

CPSC 304 Project Cover Page

Milestone #: 4

Date: April 5, 2024

Group Number: 103

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By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above. (In the case of Project Milestone 0, the main purpose of this page is for you to let us know your e-mail address, and then let us assign you to a TA for your project supervisor.)

In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia

Final project description and accomplishments

Our project allows users to filter, search for, and compare computers/parts from various retailers that meet particular specifications. Stored computer information includes CPU, GPU, storage, and monitor details as well as the location at which it is sold. Our database also allows users to share their experiences regarding the performance, design, and satisfaction of each component to help other users make informed purchases.

Final schema difference

We have no changes to the final schema.

Schema and screenshots of data

- User(Id, Name, Email, FirstLoginDate)

```
mysql> select * from User;
+----+-----+-----+-----+
| Id | Name       | Email                      | FirstLoginDate |
+----+-----+-----+-----+
| 1  | John Doe   | john.doe@example.com      | 2024-03-01 09:00:00 |
| 2  | Jane Smith | jane.smith@example.com    | 2024-02-28 09:00:00 |
| 3  | Alex Johnson | alex.johnson@example.com  | 2024-01-15 09:00:00 |
| 4  | Maria Garcia | maria.garcia@example.com  | 2023-12-10 09:00:00 |
| 5  | Paul Maximus | paul.maximus@example.com  | 2023-12-15 09:00:00 |
| 6  | testman    | test@test.com             | 2024-04-05 03:22:20 |
+----+-----+-----+-----+
6 rows in set (0.09 sec)
```

- PremiumUser(UserId, ExpiryDate)

```
mysql> select * from PremiumUser;
+-----+-----+
| UserId | ExpiryDate |
+-----+-----+
| 1      | 2025-03-01 00:00:00 |
| 2      | 2025-02-28 00:00:00 |
| 3      | 2025-01-15 00:00:00 |
| 4      | 2025-12-10 00:00:00 |
| 5      | 2025-12-15 00:00:00 |
+-----+-----+
5 rows in set (0.01 sec)
```

- Computer(Id, Brand, Price, AssembledIn, **CpuId**, **GpuId**, **StorageId**, **MonitorId**)

```
mysql> SELECT * FROM Computer;
```

Id	Brand	Price	AssembledIn	CpuId	GpuId	StorageId	MonitorId
1	Dell	3200.00	China	1	2	2	3
2	Razor	2100.00	Singapore	3	3	3	1
3	Apple	3499.99	USA	2	1	1	3
4	HP	1500.00	Japan	4	4	4	4
5	Lenovo	1800.00	Taiwan	5	5	5	5

5 rows in set (0.10 sec)

- Cpu(Id, Model, ClockSpeed, CoreCount, Generation)

```
mysql> SELECT * FROM Cpu;
```

Id	Model	ClockSpeed	CoreCount	Generation
1	Core i7	3.80	8	10
2	Core i5	2.90	4	10
3	Ryzen 7	3.60	8	4
4	Ryzen 5	3.40	6	4
5	Core i9	4.00	8	11

5 rows in set (0.03 sec)

- CpuBrand(Model, Brand)

```
mysql> select * from CpuBrand;
```

Model	Brand
Core i5	Intel
Core i7	Intel
Core i9	Intel
Ryzen 5	AMD
Ryzen 7	AMD

5 rows in set (0.03 sec)

- Gpu(Id, Brand, Model, Memory, ClockSpeed)

```
mysql> select * from Gpu;
+----+-----+-----+-----+-----+
| Id | Brand | Model          | Memory | ClockSpeed |
+----+-----+-----+-----+-----+
| 1  | Nvidia | RTX 3080       | 10     | 1.70       |
| 2  | Nvidia | RTX 3070       | 8      | 1.50       |
| 3  | AMD    | Radeon RX 6800 | 16     | 1.80       |
| 4  | AMD    | Radeon RX 6700 XT | 12    | 1.60       |
| 5  | Nvidia | RTX 3060       | 12     | 1.40       |
+----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

- Storage(Id, Brand, Model, Capacity, Type)

```
mysql> select * from Storage;
+----+-----+-----+-----+-----+
| Id | Brand | Model  | Capacity | Type |
+----+-----+-----+-----+-----+
| 1  | BrandX | ModelX1 | 256      | SSD  |
| 2  | BrandX | ModelX2 | 512      | SSD  |
| 3  | BrandY | ModelY1 | 1024     | HDD  |
| 4  | BrandY | ModelY2 | 2048     | HDD  |
| 5  | BrandZ | ModelZ  | 512      | SSD  |
+----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

- Monitor(Id, Brand, Model, RefreshRate, Size, Resolution)

```
mysql> select * from Monitor;
+----+-----+-----+-----+-----+-----+
| Id | Brand | Model  | RefreshRate | Size | Resolution |
+----+-----+-----+-----+-----+-----+
| 1  | BrandM | ModelM | 144         | 27.0 | 2560x1440  |
| 2  | BrandM | ModelN | 60          | 24.0 | 1920x1080  |
| 3  | BrandO | ModelO | 75          | 21.5 | 1920x1080  |
| 4  | BrandP | ModelP | 120         | 24.0 | 2560x1440  |
| 5  | BrandQ | ModelQ | 240         | 27.0 | 1920x1080  |
+----+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

- ComputerStore(Address, Name)

```
mysql> select * from ComputerStore;
+-----+-----+
| Address          | Name          |
+-----+-----+
| 101 Data Dr      | Tech Store D |
| 123 Tech Road    | Tech Store A |
| 202 Info Way     | Tech Store E |
| 456 Innovation Ave | Tech Store B |
| 789 Computing Blvd | Tech Store C |
+-----+-----+
5 rows in set (0.00 sec)
```

- Sells(StoreAddress, ComputerId)

```
mysql> select * from Sells;
+-----+-----+
| StoreAddress      | ComputerId    |
+-----+-----+
| 123 Tech Road     | 1             |
| 456 Innovation Ave | 2             |
| 789 Computing Blvd | 3             |
| 101 Data Dr       | 4             |
| 202 Info Way      | 5             |
+-----+-----+
5 rows in set (0.00 sec)
```

- DesignReview(Id, Rating, Description, UserId, ComputerId, Date)

```
mysql> select * from DesignReview;
+----+-----+-----+-----+-----+
| Id | Rating | Description          | UserId | ComputerId | Date          |
+----+-----+-----+-----+-----+
| 1  | 4      | Sleek and modern design. | 1      | 2          | 2024-03-06 10:00:00 |
| 2  | 5      | Outstanding design and aesthetics. | 2      | 3          | 2024-03-07 11:00:00 |
| 3  | 3      | Functional design, but nothing special. | 3      | 4          | 2024-03-08 12:00:00 |
| 4  | 2      | Design is a bit outdated. | 4      | 1          | 2024-03-09 13:00:00 |
| 5  | 1      | Unappealing design and poor ergonomics. | 5      | 2          | 2024-03-10 14:00:00 |
+----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

- PerformanceReview(Id, Rating, Description, BenchMark, **UserId**, **ComputerId**, Date)

```
mysql> select * from PerformanceReview;
```

Id	Rating	Description	BenchMark	UserId	ComputerId	Date
1	5	Excellent performance and value.	10000.00	1	1	2024-03-01 09:00:00
2	4	Good performance for the price.	8500.00	2	2	2024-03-01 22:00:00
3	4	Good performance for the price.	8500.00	2	2	2024-03-02 09:30:00
4	3	Average performance, decent for everyday tasks.	7000.00	3	3	2024-03-03 10:00:00
5	2	Below average performance, struggles with heavy tasks.	5500.00	4	4	2024-03-04 10:30:00
6	1	Poor performance, not recommended for modern applications.	4000.00	5	5	2024-03-05 11:00:00

6 rows in set (0.00 sec)

- SatisfactionReview(Id, Rating, Description, **UserId**, **ComputerId**, Date)

```
mysql> select * from SatisfactionReview;
```

Id	Rating	Description	UserId	ComputerId	Date
1	4	Quite satisfied with the purchase overall.	1	1	2024-03-11 15:00:00
2	3	Satisfied, but there are some issues.	2	2	2024-03-12 16:00:00
3	5	Extremely satisfied, exceeded expectations.	3	3	2024-03-13 17:00:00
4	2	Not satisfied, many problems encountered.	4	4	2024-03-14 18:00:00
5	1	Very unsatisfied, would not recommend.	5	5	2024-03-15 19:00:00

5 rows in set (0.00 sec)

- AssembledIn(**Brand**, AssembledIn)

```
mysql> select * from AssembledIn;
```

Brand	AssembledIn
Apple	United States
Dell	China
Lenovo	China
Samsung	South Korea
Sony	Japan

5 rows in set (0.00 sec)

- Compares(UserId, ComputerIdOne, ComputerIdTwo)

```
mysql> select * from Compares;
+-----+-----+-----+
| UserId | ComputerIdOne | ComputerIdTwo |
+-----+-----+-----+
|      1 |              3 |              2 |
|      2 |              4 |              3 |
|      3 |              5 |              4 |
|      4 |              1 |              5 |
|      5 |              2 |              1 |
+-----+-----+-----+
5 rows in set (0.01 sec)
```

- Endorses(StoreAddress, ReviewID)

```
mysql> select * from Endorses;
+-----+-----+
| StoreAddress | ReviewId |
+-----+-----+
| 123 Tech Road |         1 |
| 456 Innovation Ave |         2 |
| 789 Computing Blvd |         3 |
| 101 Data Dr |         4 |
| 202 Info Way |         5 |
+-----+-----+
5 rows in set (0.00 sec)
```

- Searches(UserId, ComputerId)

```
mysql> select * from Searches;
+-----+-----+
| UserId | ComputerId |
+-----+-----+
|      1 |          2 |
|      2 |          3 |
|      3 |          4 |
|      4 |          5 |
|      5 |          1 |
+-----+-----+
5 rows in set (0.00 sec)
```

List of all SQL queries used and where they can be found in the code

All of our SQL queries can be found under “src/backend/main.py”.

Insert

The add computer feature utilizes the INSERT statement. This can be found under line 304 (see addComputer()).

Multiple queries are used to check for duplicates and insert values when necessary. Multiple tables are affected to accomplish foreign key constraints.

Delete

The delete user feature utilizes the DELETE statement. This can be found under line 170. See

- Delete the user button from the frontend: /src/frontend/app.tsx - handleDeleteUser()
- Deletion handling logic: /src/backend/main.py - delete_user()

User deletion will trigger cascade-on-deletion for tables:

1. PremiumUser
2. Performance Review

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3. Design Review
4. Satisfaction Review
5. Searches
6. Compares

Update

The update review feature utilizes the UPDATE statement. This can be found under line 457 (see `update_review()`)

Selection

The search computers feature satisfies the SELECTION query. This can be found under line 191 (see `filter_computers()`)

Users can manipulate values to select on, it also incorporates multiple tables and attributes to select on.

Projection

The “projection” button/page feature satisfies the PROJECTION query. This can be found under line 266 (see `get_tuples_by_attributes()`).

One may also see line 251 (`getAllTables`) as this is used to provide users with all of the tables existing. Both are used to provide a level of flexibility to project on different data.

Join

The CPU by computer feature (when the user clicks on one of the resulting computers from the search) satisfies the JOIN query. This can be found under line 234 (see `get_cpu_by_computer()`).

The Cpu table is joined with the Computer table to provide more detailed information about the computer and the associated CPU.

Aggregation with Group By

The count by brand button satisfies the “Aggregation with Group By” query. This can be found under line 118 (see `get_aggregation()`).

Group the computers by brand.

Aggregation with Having

The expensive brands button satisfies the “Aggregation with Having” query. This can be found under line 133 (see `get_aggregation_having()`).

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Group the computer by brands, and only select those that have an average price higher than 2000.

Nested Aggregation with Group By

The best brands button satisfies the “Aggregation with Group By” query. This can be found under line 151 (see `get_aggregation_nested()`).

The best brands are those with a higher average rating than the aggregated average rating among all brands.

Division

The “you wrote every type of review?” button satisfied the DIVISION query. This can be found under line 481 (see `get_user_wrote_all_reviews()`).

Shows whether a user wrote every type of review or not.

4. Screenshots of all queries in GUI

Insert

- Before

The screenshot shows a web form titled "Add Computer". The form contains several input fields and a submit button. The fields are organized as follows:

- Brand**: A text input field.
- Price**: A text input field.
- Assembled In**: A text input field.
- CPU**: A section header for a group of fields:
 - CPU Model**: A text input field.
 - CPU Brand**: A text input field.
 - CPU Clock Speed**: A text input field.
 - CPU Generation**: A text input field.
 - CPU Core Count**: A text input field.
- GPU**: A section header for a group of fields:
 - GPU Brand**: A text input field.
 - GPU Model**: A text input field.
 - GPU Memory**: A text input field.
 - GPU Clock Speed**: A text input field.

At the bottom of the form, there are two buttons: "Add Computer" and "Close".

- during

Add Computer

Computer				
Intel	500	Canada		

CPU				
Intel i100	Intel	100	5	8

GPU			
AMD	Magic	5	10

Add Computer Close

- after
 - Entry in Computer

```
mysql> select * from Computer
-> ;
```

Id	Brand	Price	AssembledIn	CpuId	GpuId	StorageId	MonitorId
1	Dell	3200.00	China	1	2	2	3
2	Razor	2100.00	Singapore	3	3	3	1
3	Apple	3499.99	USA	2	1	1	3
4	HP	1500.00	Japan	4	4	4	4
5	Lenovo	1800.00	Taiwan	5	5	5	5
6	Intel	300.00	Canada	6	6	1	1
7	Intel	500.00	Canada	7	7	1	1

- Entry in Cpu

```
mysql> select * from Cpu
-> ;
```

Id	Model	ClockSpeed	CoreCount	Generation
1	Core i7	3.80	8	10
2	Core i5	2.90	4	10
3	Ryzen 7	3.60	8	4
4	Ryzen 5	3.40	6	4
5	Core i9	4.00	8	11
6	Core i99	5.00	5	5
7	Intel i100	100.00	8	5

- Entry in CpuBrand

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```
mysql> select * from CpuBrand;
+-----+-----+
| Model | Brand |
+-----+-----+
| Core i5 | Intel |
| Core i7 | Intel |
| Core i9 | Intel |
| Core i99 | Intel |
| Intel i100 | Intel |
| Ryzen 5 | AMD |
| Ryzen 7 | AMD |
+-----+-----+
7 rows in set (0.00 sec)
```

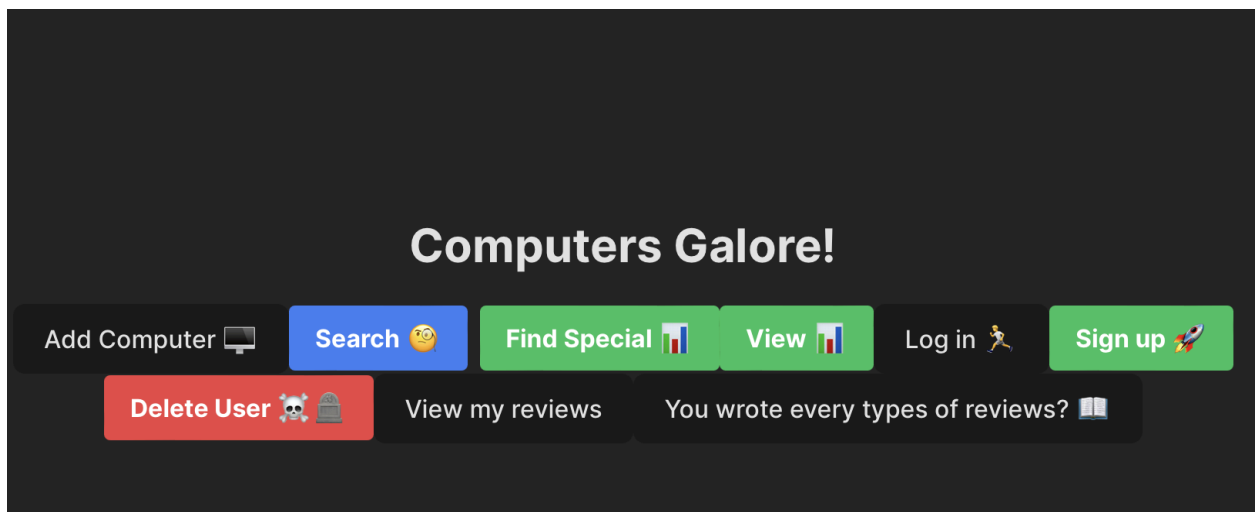
- Entry in Gpu

```
mysql> select * from Gpu
-> ;
+-----+-----+-----+-----+-----+
| Id | Brand | Model | Memory | ClockSpeed |
+-----+-----+-----+-----+-----+
| 1 | Nvidia | RTX 3080 | 10 | 1.70 |
| 2 | Nvidia | RTX 3070 | 8 | 1.50 |
| 3 | AMD | Radeon RX 6800 | 16 | 1.80 |
| 4 | AMD | Radeon RX 6700 XT | 12 | 1.60 |
| 5 | Nvidia | RTX 3060 | 12 | 1.40 |
| 6 | NVIDIA | Magic | 5 | 9.90 |
| 7 | AMD | Magic | 5 | 5.00 |
+-----+-----+-----+-----+-----+
7 rows in set (0.01 sec)
```

Delete

Deleting user

1. Press "Delete user" button



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2. Enter user email to be deleted

The screenshot shows a web application interface with a dark theme. A modal window titled 'Delete User' is centered on the screen. Inside the modal, there is a label 'Email:' followed by a text input field. Below the input field are two buttons: 'Delete' and 'Cancel'. In the background, the application's navigation bar is visible, featuring buttons for 'Add Computer', 'Search', 'Delete User' (with a skull and crossbones icon), 'View my reviews', 'Log in', and 'Sign up' (with a rocket icon). A status message at the bottom of the navigation bar reads 'You wrote every types of reviews?'.

3. Entries of Performance Review, Design Review, Satisfaction Review, User table before deletion

```
mysql> select * from User;
+----+-----+-----+-----+
| Id | Name   | Email                | FirstLoginDate |
+----+-----+-----+-----+
| 1  | John Doe | john.doe@example.com | 2024-03-01 09:00:00 |
| 2  | Jane Smith | jane.smith@example.com | 2024-02-28 09:00:00 |
| 3  | Alex Johnson | alex.johnson@example.com | 2024-01-15 09:00:00 |
| 4  | Maria Garcia | maria.garcia@example.com | 2023-12-10 09:00:00 |
| 5  | Paul Maximus | paul.maximus@example.com | 2023-12-15 09:00:00 |
| 6  | test-user | test@test.com         | 2023-12-15 09:00:00 |
+----+-----+-----+-----+
6 rows in set (0.06 sec)
```



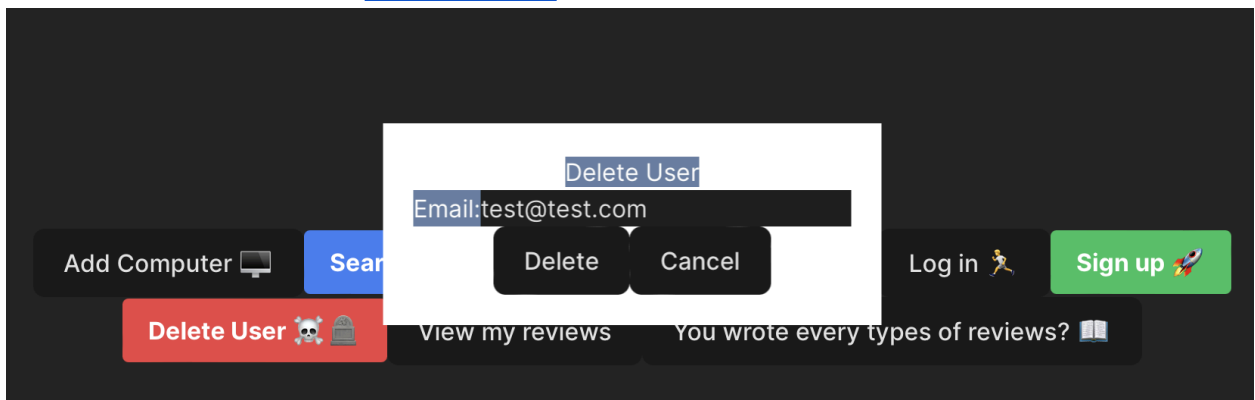
```
mysql> Select * from SatisfactionReview;
+----+-----+-----+-----+-----+-----+
| Id | Rating | Description                                | UserId | ComputerId | Date           |
+----+-----+-----+-----+-----+-----+
| 1  | 3      | TEST SATISFACTION REVIEW                  | 6      | 1           | 2024-03-09 13:00:00 |
| 2  | 4      | Quite satisfied with the purchase overall. | 1      | 1           | 2024-03-11 15:00:00 |
| 3  | 3      | Satisfied, but there are some issues.      | 1      | 2           | 2024-03-12 16:00:00 |
| 4  | 5      | Extremely satisfied, exceeded expectations. | 3      | 3           | 2024-03-13 17:00:00 |
| 5  | 2      | Not satisfied, many problems encountered.   | 4      | 4           | 2024-03-14 18:00:00 |
| 6  | 1      | Very unsatisfied, would not recommend.     | 5      | 5           | 2024-03-15 19:00:00 |
+----+-----+-----+-----+-----+-----+
6 rows in set (0.00 sec)
```

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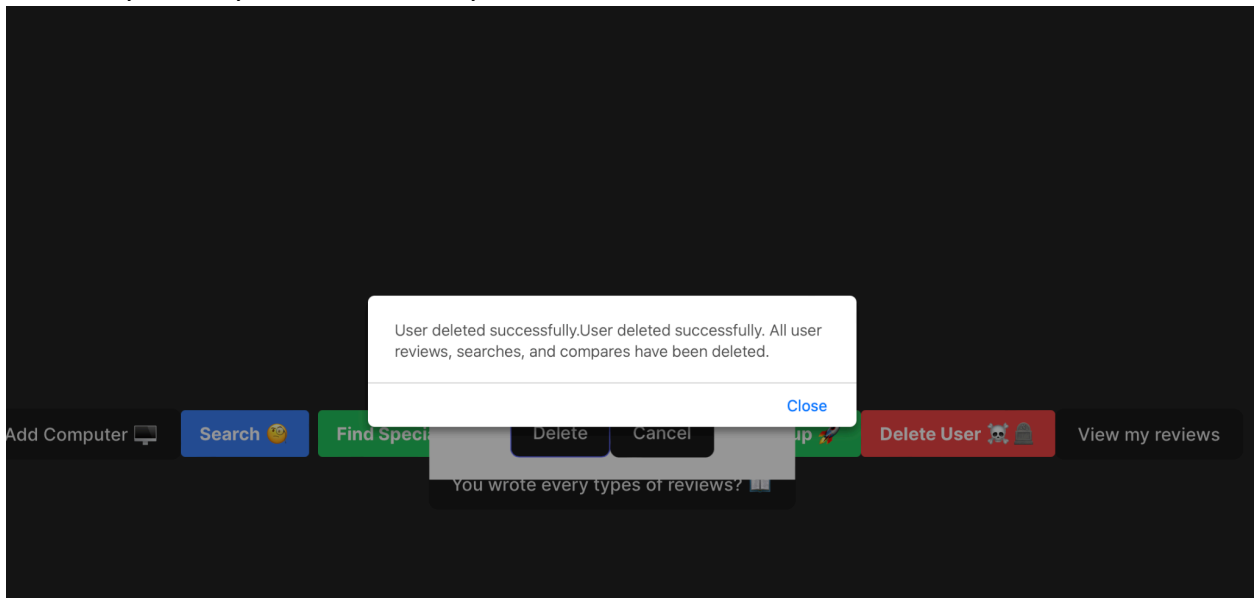
```
mysql> select * from PerformanceReview;
+-----+-----+-----+-----+-----+-----+
| Id | Rating | Description | BenchMark | UserId | ComputerId | Date |
+-----+-----+-----+-----+-----+-----+
| 1 | 5 | Excellent performance and value. | 10000.00 | 1 | 1 | 2024-03-01 09:00:00 |
| 2 | 4 | Good performance for the price. | 8500.00 | 2 | 2 | 2024-03-01 22:00:00 |
| 3 | 4 | Good performance for the price. | 8500.00 | 2 | 2 | 2024-03-02 09:30:00 |
| 4 | 3 | Average performance, decent for everyday tasks. | 7000.00 | 3 | 3 | 2024-03-03 10:00:00 |
| 5 | 2 | Below average performance, struggles with heavy tasks. | 5500.00 | 4 | 4 | 2024-03-04 10:30:00 |
| 6 | 3 | TEST PERFORMANCE REVIEW22 | 5500.00 | 6 | 4 | 2024-03-04 10:30:00 |
| 7 | 1 | Poor performance, not recommended for modern applications. | 4000.00 | 5 | 5 | 2024-03-05 11:00:00 |
+-----+-----+-----+-----+-----+-----+
7 rows in set (0.02 sec)

mysql> select * from DesignReview;
+-----+-----+-----+-----+-----+-----+
| Id | Rating | Description | UserId | ComputerId | Date |
+-----+-----+-----+-----+-----+-----+
| 1 | 4 | Sleek and modern design. | 1 | 2 | 2024-03-06 10:00:00 |
| 2 | 5 | Outstanding design and aesthetics. | 2 | 3 | 2024-03-07 11:00:00 |
| 3 | 3 | Functional design, but nothing special. | 3 | 4 | 2024-03-08 12:00:00 |
| 4 | 2 | Design is a bit outdated. | 4 | 1 | 2024-03-09 13:00:00 |
| 5 | 3 | TEST DESIGN REVIEW | 6 | 1 | 2024-03-09 13:00:00 |
| 6 | 1 | Unappealing design and poor ergonomics. | 5 | 2 | 2024-03-10 14:00:00 |
+-----+-----+-----+-----+-----+-----+
6 rows in set (0.00 sec)
```

4. Delete test user with email test@test.com



5. User entry and any review written by that user are deleted.



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```
mysql> select * from SatisfactionReview;
```

Id	Rating	Description	UserId	ComputerId	Date
2	4	Quite satisfied with the purchase overall.	1	1	2024-03-11 15:00:00
3	3	Satisfied, but there are some issues.	1	2	2024-03-12 16:00:00
4	5	Extremely satisfied, exceeded expectations.	3	3	2024-03-13 17:00:00
5	2	Not satisfied, many problems encountered.	4	4	2024-03-14 18:00:00
6	1	Very unsatisfied, would not recommend.	5	5	2024-03-15 19:00:00

```
5 rows in set (0.00 sec)
```

```
mysql> select * from PerformanceReview;
```

ID	Rating	Description	BenchMark	UserId	ComputerId	Date
1	5	Excellent performance and value.	10000.00	1	1	2024-03-01 09:00:00
2	4	Good performance for the price.	8500.00	2	2	2024-03-01 22:00:00
3	4	Good performance for the price.	8500.00	2	2	2024-03-02 09:30:00
4	3	Average performance, decent for everyday tasks.	7000.00	3	3	2024-03-03 10:00:00
5	2	Below average performance, struggles with heavy tasks.	5500.00	4	4	2024-03-04 10:30:00
7	1	Poor performance, not recommended for modern applications.	4000.00	5	5	2024-03-05 11:00:00

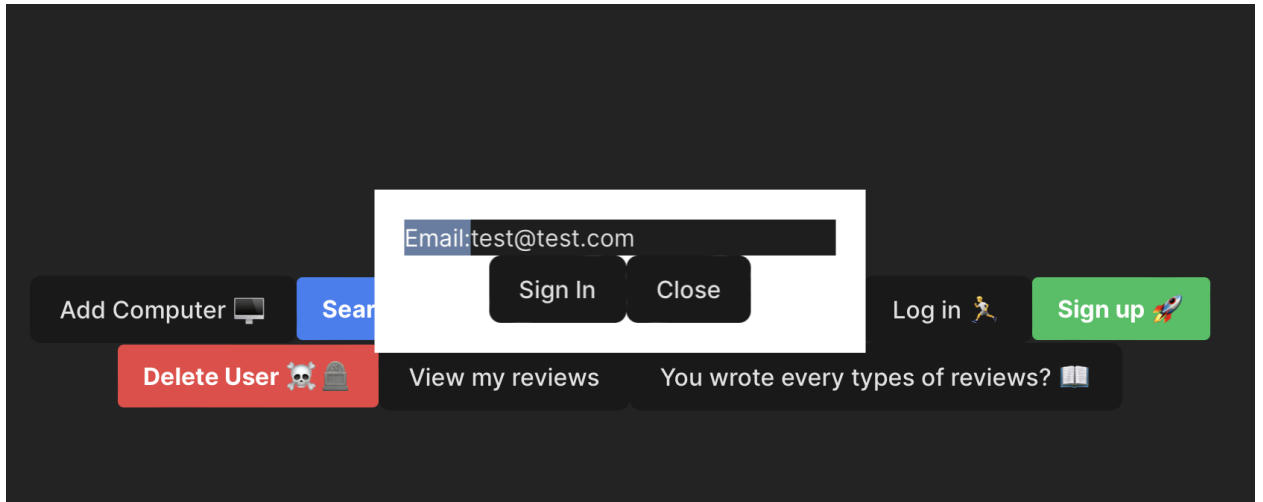
6 rows in set (0.00 sec)

Update review written by logged-in user.

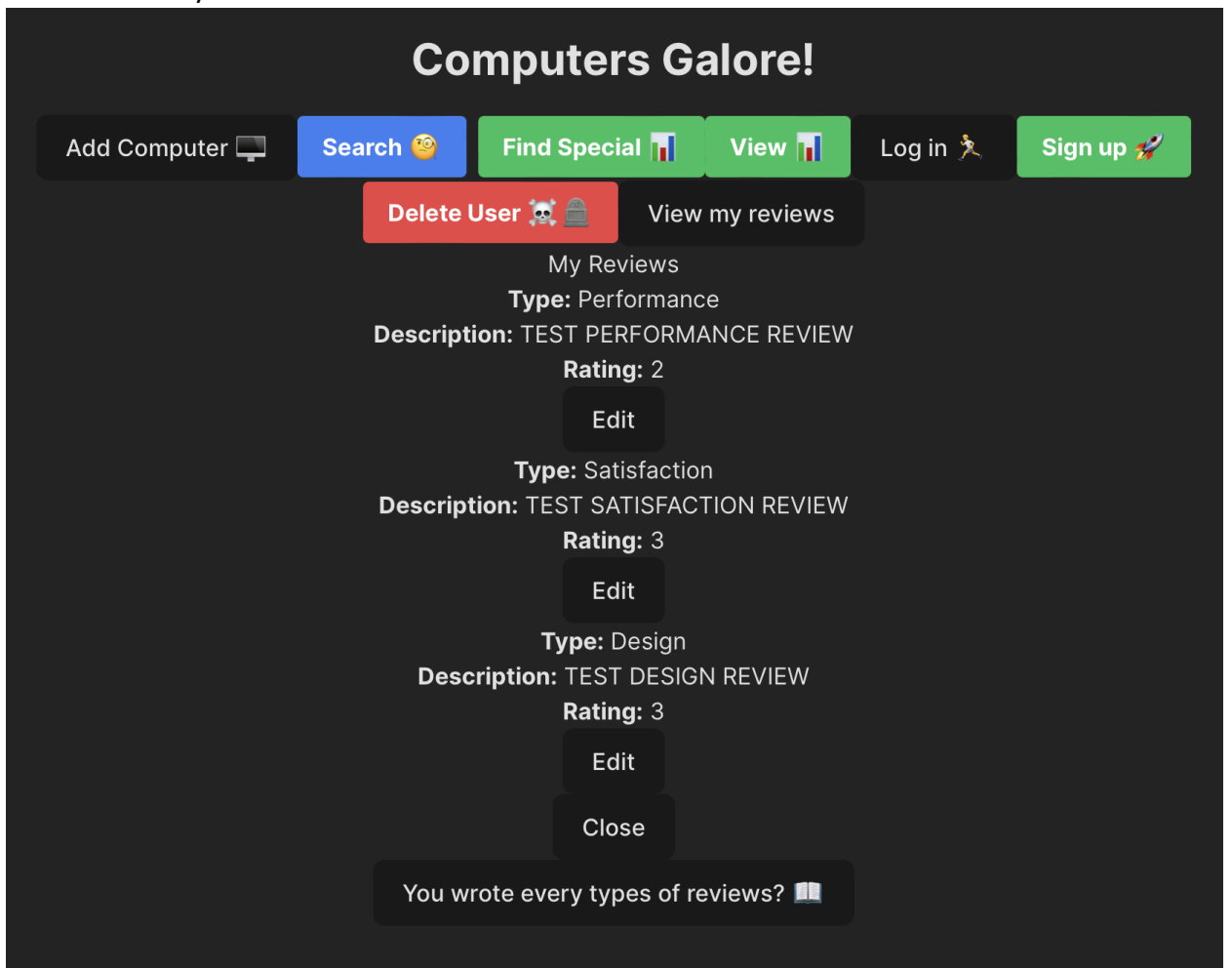
It will update the review description and rating

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1. Log in



2. Select "View my reviews"



3. Press Edit and update the description and rating

The screenshot shows the 'Computers Galore!' application interface. At the top, there's a navigation bar with buttons: 'Add Computer' (with a monitor icon), 'Search' (with a magnifying glass icon), 'Find Special' (with a bar chart icon), 'View' (with a bar chart icon), 'Log in' (with a person icon), and 'Sign up' (with a rocket icon). Below this, there's a 'Delete User' button (with a skull and crossbones icon) and a 'View my reviews' button. The main content area shows an 'Edit Review' form. The form has a 'Description' field with the text 'TEST PERFORMANCE REVIEW' and a 'Rating' field with the value '2'. There are 'Save' and 'Cancel' buttons. At the bottom, there's a message: 'You wrote every types of reviews?' with a book icon.

4. After "Save", press "View my reviews" again and confirm updated review

The screenshot shows the 'Computers Galore!' application interface after saving the review. The navigation bar is the same. Below it, there's a 'Delete User' button and a 'View my reviews' button. The main content area shows a list of reviews under the heading 'My Reviews'. The first review is: 'Type: Performance', 'Description: TEST PERFORMANCE REVIEW 22', 'Rating: 4', with an 'Edit' button. The second review is: 'Type: Satisfaction', 'Description: TEST SATISFACTION REVIEW', 'Rating: 3', with an 'Edit' button. The third review is: 'Type: Design', 'Description: TEST DESIGN REVIEW', 'Rating: 3', with an 'Edit' button. At the bottom, there's a 'Close' button and a message: 'You wrote every types of reviews?' with a book icon.

Selection

1. Click search to go to the search page
2. Select the wanted filters for CPU and GPU to find the corresponding computers

Filter CPU

Brand

☒ Intel ☒ AMD

Core Count

Filter GPU

Brand

☒ NVIDIA ☐ AMD

Memory

Search

3. Click search! You will be navigated to a new page with the results

Brand	Assembled In	Price (\$)
Dell	China	3200
Lenovo	Taiwan	1800
Rows per page: 5 1-2 of 2 < < > >		

Projection

1. Click View. Dropdown for table and attribute selection appears.

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Table ▼

Attributes ▼

SUBMIT

2. Select table

AssembledIn

BrandAssembles

Compares

Computer

ComputerStore

Cpu

CpuBrand

DesignReview

Endorses

Gpu

Monitor

PerformanceReview

PremiumUser

SatisfactionReview

Searches

Sells

Storage

User

3. Select Attributes

table

Com

Attrib

Brand

SUB

☐ Id

☒ Brand

☒ Price

☐ AssembledIn

☐ CpuId

☐ GpuId

☐ StorageId

☐ MonitorId

4. Click submit! Results are displayed in table

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Table

Computer

Attributes

Brand, Price

SUBMIT

Brand	Price
Dell	3200
Razor	2100
Apple	3499.99
HP	1500
Lenovo	1800

Join

1. Click filtering criteria like described in Projection, then click on any row.

Brand	Assembled In	Price (\$)
Apple		3499.99
Dell		3200
Razor		2100
HP		1500
Lenovo		1800

Modal title

Model: Core i5
Clock Speed: 2.9 GHz
Core Count: 4
Generation: 10

SAVE CHANGES

Rows per page: 5 1-5 of 5

Aggregation with Group By

1. Click Find Special

Let's do some aggregations shall we

[COUNT BY BRAND](#) [EXPENSIVE BRANDS](#) [BEST BRANDS](#) [CLEAR](#)

2. Click Count By Brand

Let's do some aggregations shall we

[COUNT BY BRAND](#) [EXPENSIVE BRANDS](#) [BEST BRANDS](#) [CLEAR](#)

Brand	Count
Apple	1
Dell	1
HP	1
Lenovo	1
Razor	1

Aggregation with Having

1. After clicking Find Special, click Expensive Brands

Let's do some aggregations shall we

[COUNT BY BRAND](#) [EXPENSIVE BRANDS](#) [BEST BRANDS](#) [CLEAR](#)

Brand	Average Price
Apple	3499.99
Dell	3200
Razor	2100

Nested Aggregation with Group By

1. After clicking Find Special, click Best Brands

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Let's do some aggregations shall we

[COUNT BY BRAND](#) [EXPENSIVE BRANDS](#) [BEST BRANDS](#) [CLEAR](#)

Brand	Average Rating
Apple	5
Dell	3.5

Division

Check if the logged-in user wrote every type of review (Performance, Satisfaction, Design)

1. Log in and press “You wrote every types of reviews?” button and check the pop-up message

The screenshot shows the 'Computers Galore!' web application interface. At the top, there's a navigation bar with buttons: 'Add Computer' (with a monitor icon), 'Search' (with a magnifying glass icon), 'Find Special' (with a bar chart icon), 'View' (with a bar chart icon), 'Log in' (with a person icon), and 'Sign up' (with a rocket icon). Below this, there's a 'Delete User' button (with a skull and crossbones icon) and a 'View my reviews' button. The main content area displays 'My Reviews' with a filter 'Type: Performance'. A white pop-up message box is centered, stating 'You have written all types of reviews. Thank you!!!' with three book icons and a 'Close' link. Below the pop-up, the review details for 'Type: Satisfaction' are visible, including 'Description: TEST SATISFACTION REVIEW' and 'Rating: 3', with an 'Edit' button. Below that, the review details for 'Type: Design' are visible, including 'Description: TEST DESIGN REVIEW' and 'Rating: 3', with an 'Edit' button. At the bottom, there's a 'Close' button and a 'You wrote every types of reviews?' button with two book icons.

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2. If the user didn't write every type of review, pop-up will say user didn't write every kind of review

