**[Table of Contents:](#Table_of_Contents)**

[View Statistics](#View_Statistics)

[Get Holiday List](#Get_Holiday_List)

[Add Holiday](#Add_Holiday)

[Maintain Population](#Maintain_Population)

[View Product by Category Report](#View_Product_by_Category_Report)

[View Actual vs. Predicted Revenue for Couches and Sofas Report](#View_Actual_vs_Predicted_Revenue)

[Get Available State List](#Get_Available_State_List)

[View Store Revenue by Year by State Report](#View_Store_Revenue_by_Year_by_State)

[View Groundhog Day Outdoor Furniture Report](#View_Groundhog_Day_Outdoor_Furniture)

[Get Year and Month List](#Get_Year_and_Month_List)

[View State with Highest Volume by Category Report](#View_State_with_Highest_Volume)

[View Revenue by Population Report](#View_Revenue_by_Population_Report)

[View Childcare Sales Volume Report](#View_Childcare_Sales_Volume_Report)

[View Restaurant Impact on Category Sales Report](#View_Restaurant_Impact_on_Category_Sales)

[View Advertising Campaign Analysis Report](#View_Advertising_Campaign_Analysis)

View Statistics

Abstract Code[[1]](#footnote-1)

* Show *“****Holiday Maintenance****”, “****View Product by Category Report****”, “****View Actual vs. Predicted Revenue for Couches and Sofas Report****”, “****View Store Revenue by Year by State Report****”, “****View Groundhog Day Outdoor Furniture Report****”, “****View State with Highest Volume by Category Report****”, “****View Revenue by Population Report****”, “****View Childcare Sales Volume Report****”, “****View Restaurant Impact on Category Sales Report****”, “****View Advertising Campaign Analysis Report****”,* and *“****Population Maintenance****”* buttons/links on the **Dashboard** form.
* Upon:
  + Click ***Holiday Maintenance*** button – Jump to the **Holiday Maintenance** form.
  + Click ***View Product by Category Report*** button – Jump to the **View Product by Category Report** task.
  + Click ***View Actual vs. Predicted Revenue for Couches and Sofas Report*** button – Jump to the **View Actual vs. Predicted Revenue for Couches and Sofas Report** task.
  + Click ***View Store Revenue by Year by State Report*** button – Jump to the **Get Available State List** task.
  + Click ***View Groundhog Day Outdoor Furniture Report*** button – Jump to the **View Groundhog Day Outdoor Furniture Report** task.
  + Click ***View State with Highest Volume by Category Report*** button – Jump to the **Get Year and Month List** task.
  + Click ***View Revenue by Population Report*** button – Jump to the **View Revenue by Population Report** task.
  + Click ***View Childcare Sales Volume Report*** button – Jump to the **View Childcare Sales Volume** **Report** task.
  + Click ***View Restaurant Impact on Category Sales Report*** button – Jump to the **View Restaurant Impact on Category Sales Report** task.
  + Click ***View Advertising Campaign Analysis Report*** button – Jump to the **View Advertising Campaign Analysis Report** task.
  + Click ***Population Maintenance*** button – Jump to the **Population Maintenance** form.
* Display statistics for “the count of stores”, “count of stores offering food (have a restaurant, a snack bar, or both)”, “count of stores offering childcare”, “count of products”, and “count of distinct advertising campaigns” on the **Dashboard** form.
  + Show “the count of stores”.
    - Query for total count of Store\_Number in the STORE table.
    - Display the total count.

SELECT COUNT(Store\_Number) FROM STORE;

* + Show “count of stores offering food”.
    - Query for the total count of Store\_Number in the STORE table that has either or both Has\_Restaurant and Has\_Snack\_Bar value as true.
    - Display the total count.

SELECT COUNT(Store\_Number)

FROM STORE

WHERE Has\_Restaurant IS TRUE OR Has\_Snack\_Bar IS TRUE;

* + Show “count of stores offering childcare”.
    - Query for the total count of Store\_Number with a Time\_Limit in the STORE table.
    - Display the total count.

SELECT COUNT(Store\_Number)

FROM STORE

WHERE Time\_Limit IS NOT NULL;

* + Show “count of products”.
    - Query for the total count of PID in the PRODUCT table.
    - Display the total count.

SELECT COUNT(PID) FROM PRODUCT;

* + Show “count of distinct advertising campaigns”.
    - Query for the total count of Description in ADVERTISING\_CAMPAIGN table.
    - Display the total count.

SELECT COUNT(Description) FROM ADVERTISING\_CAMPAIGN;

Get Holiday List

Abstract Code

* User clicked on the ***Holiday Maintenance*** button from the **Dashboard** form.
* Run the **Get Holiday List** task: query for information about the available Name field from the HOLIDAY table.
  + Display the Holiday Name list.

SELECT `Date`, `Name` FROM HOLIDAY;

* Upon:
  + User enters Holiday Name ($HolidayName) in input textbox and selects Date ($HolidayDate) in Calendar Dropdown.
  + Click ***Add Holiday*** button –
    - Jump to the **Add Holiday** task.
* When ready, user can click on the ***Return*** button to return to the **Dashboard** form.

Add Holiday

Abstract Code

* User enters Holiday Name ($HolidayName) in input textbox and selects Date ($HolidayDate) in Calendar Dropdown.
* Click ***Add Holiday*** button.
* Run the **Add Holiday** task:
  + If data validation passed for both Holiday Name and Date in client side, then:
    - If Holiday Name does not exist but Date exists:
* Store Holiday Name in HOLIDAY table and link its Date with DAY table.
* Go back to **Holiday Maintenance** form and show success message.
  + - If both Holiday Name and Date do not exist:
* Store the Date in DAY table.
* Store the Date and Holiday Name in HOLIDAY table.

INSERT INTO `DAY` (`Date`)

SELECT '$HolidayDate'

FROM `DAY`

WHERE NOT EXISTS (

SELECT 1 FROM `DAY` WHERE `Date` = '$HolidayDate')

LIMIT 1;

INSERT INTO HOLIDAY (`Date`, `Name`)

SELECT '$HolidayDate', '$HolidayName'

FROM HOLIDAY

WHERE NOT EXISTS (

SELECT 1 FROM HOLIDAY WHERE `Date` = '$HolidayDate' AND `Name` = '$HolidayName')

LIMIT 1;

* Go back to **Holiday Maintenance** form and show success message.
  + Else: display the invalid error message in **Holiday Maintenance** form.
* When ready, user can click on the ***Return*** button to return to the **Dashboard** form.

Maintain Population

Abstract Code

* User clicked on the ***Population Maintenance*** button from the **Dashboard** form.
* Query for information about the available State\_Location, City\_Name, and Population fields from the CITY table.
  + Display State\_Location list in ascending order in the drop-down list.

SELECT DISTINCT State\_Location

FROM CITY

ORDER BY State\_Location ASC;

* + Display the available City\_Name list in ascending order based on the selected $State\_Location in the drop-down list.

SELECT City\_Name

FROM CITY

WHERE State\_Location = '$State\_Location'

ORDER BY City\_Name ASC;

* + Display Population based on the selected $State\_Location and $City\_Name in the view population textbox.

SELECT Population

FROM CITY

WHERE State\_Location = '$State\_Location' AND City\_Name = '$City\_Name';

* User edits population textbox.
* Upon:
  + Click ***Update Population*** button –
    - Jump to the **Update Population** task.
* Run the **Update Population** task.
  + If data validation passed for $Population in client side, then:
    - If the updated population entered is the same as the original population, do nothing.
    - Else: the updated population entered is different from the original population, update the Populationin the CITY table.

UPDATE CITY

SET Population = '$Population'

WHERE State\_Location = '$State\_Location' AND City\_Name = '$City\_Name' AND Population <> '$Population';

* + Else: display the invalid error message in **Population Maintenance** form.
* When ready, user can click on the ***Return*** button to return to the **Dashboard** form.

View Product by Category Report

Abstract Code

* User clicked on the ***View Product by Category Report*** button from the **Dashboard** form.
* Run the **View Product by Category Report** task: query for each category from CATEGORY, ASSIGNED, and PRODUCT tables, including those without products.
  + Find all Category\_Name data (from the CATEGORY table).
  + For each Category\_Name including those without products:
    - Find total number of products by counting their PID data (from the PRODUCT table).
    - Find minimum, average, and maximum Retail\_Price data for all products (from the PRODUCT table).
  + Sort by Category\_Name in ascending order.

SELECT C.Category\_Name, COUNT(P.PID) AS Cnt\_Product, MIN(P.Retail\_Price) AS Min\_RtlPrc, AVG(P.Retail\_Price) AS Avg\_RtlPrc, MAX(P.Retail\_Price) AS Max\_RtlPrc

FROM CATEGORY AS C

LEFT JOIN ASSIGNED AS A ON C.Category\_Name = A.Category\_Name

LEFT JOIN PRODUCT AS P ON A.PID = P.PID

GROUP BY C.Category\_Name

ORDER BY C.Category\_Name ASC;

* When ready, user can click on the ***Return*** button to return to the **Dashboard** form.

View Actual vs. Predicted Revenue for Couches and Sofas Report

Abstract Code

* User clicked on the ***View Actual vs. Predicted Revenue for Couches and Sofas Report*** button from the **Dashboard** form.
* Run the **View Actual vs. Predicted Revenue for Couches and Sofas Report**task:
  + Find the 'Couches and Sofas' category (from the CATEGORY table).
  + For each product in 'Couches and Sofas' category:
    - Find PID, Product\_Name, and Retail\_Price data (from the PRODUCT table).
    - Find the total number of units ever sold by aggregating Quantity (from the SALE table).
    - Find the total number of units sold at a discount by aggregating Quantity (from the SALE table) when the product has a Discount\_Price (from the DISCOUNT table).
    - Find the total number of units sold at retail price by aggregating Quantity (from the SALE table) when the product doesn’t have a Discount\_Price (from the DISCOUNT table).
    - Find the actual revenue by aggregating Total\_Amount (from the SALE table).
      * Total\_Amount (from the SALE table) is calculated based on the Date, Quantity, and individual item price.
      * Individual item price equals Retail\_Price (from the PRODUCT table) when the product doesn’t have a Discount\_Price. Otherwise, individual item price equals Discount\_Price (from the DISCOUNT table).
    - Find the predicted revenue by aggregating the following multiplication result: Retail\_Price (from the PRODUCT table) \* Quantity (from the SALE table) \* quantity multiplier. The quantity multiplier equals 0.75 when the product has a Discount\_Price (from the DISCOUNT table), otherwise, the quantity multiplier equals 1.
    - Find the revenue difference by subtracting predicted revenue from actual revenue.
  + If the revenue difference is greater than $5000 (positive or negative): Display revenue difference and sort in descending order.

SELECT P.PID, P.Product\_Name, P.Retail\_Price,

SUM(IFNULL(S.Quantity,0)) AS Tot\_UnitSold,

SUM(IF(D.Discount\_Price IS NULL,0,1) \* IFNULL(S.Quantity,0)) AS Tot\_UnitSold\_AtDsct,

SUM(IF(D.Discount\_Price IS NULL,1,0) \* IFNULL(S.Quantity,0)) AS Tot\_UnitSold\_AtRtl,

SUM(IFNULL(S.Total\_Amount,0)) AS Act\_Revenue,

SUM(P.Retail\_Price \* IFNULL(S.Quantity,0) \* IF(D.Discount\_Price IS NULL, 1, 0.75)) AS Pred\_Revenue,

(SUM(IFNULL(S.Total\_Amount,0)) - SUM(P.Retail\_Price \* IFNULL(S.Quantity,0) \* IF(D.Discount\_Price IS NULL, 1, 0.75))) AS Diff\_Act\_Pred\_Revenue

FROM CATEGORY AS C

LEFT JOIN ASSIGNED AS A ON C.Category\_Name = A.Category\_Name

LEFT JOIN PRODUCT AS P ON A.PID = P.PID

LEFT JOIN SALE AS S ON P.PID = S.PID

LEFT JOIN DISCOUNT AS D ON S.Date = D.Date AND S.PID = D.PID

WHERE C.Category\_Name = 'Couches and Sofas'

GROUP BY P.PID

HAVING Diff\_Act\_Pred\_Revenue > 5000 OR Diff\_Act\_Pred\_Revenue < -5000

ORDER BY Diff\_Act\_Pred\_Revenue DESC;

* When ready, user can click on the ***Return*** button to return to the **Dashboard** form.

Get Available State List

Abstract Code

* User clicked on ***View Store Revenue by Year by State Report*** button from the **Dashboard** form.
* Run the **Get Available State List** task: query for information about the available State\_Locationfield from the CITY table.
  + Display State\_Location list in ascending order on the drop-down list.

SELECT DISTINCT State\_Location

FROM CITY

ORDER BY State\_Location ASC;

* On the drop-down list, show ***Run Report*** button.
* Upon:
  + Click ***Run Report*** button –
    - If $State\_Locationis selected – Jump to the **View State Revenue by Year by State Report** task.
    - If $State\_Locationis empty – Display a message asking for user input.
* When ready, user can click on the ***Return*** button to return to the **Dashboard** form.

View Store Revenue by Year by State Report

Abstract Code

* User clicked on the ***Run Report*** button from the drop-down list.
* Run the **View State Revenue by Year by State Report** task:
  + Find all stores from the STORE table based on the selected $State\_Location.
  + For each store and each year,
    - Display Store\_Number, Street\_Address, and City\_Name (from the STORE table), and the year of Date (from the SALE table).
    - Find the total revenue by aggregating all products’ sale revenue based on Total\_Amount (from the SALE table).
  + Sort by year ascendingly, and then sort by total revenue descendingly.

SELECT STORE.Store\_Number, Street\_Address, City\_Name, YEAR(Date), SUM(IFNULL(Total\_Amount, 0)) AS Revenue

FROM STORE

LEFT JOIN SALE ON STORE.Store\_Number = SALE.Store\_Number

WHERE State\_Location = '$State\_Location'

GROUP BY STORE.Store\_Number, YEAR(Date)

ORDER BY YEAR(Date) ASC, Revenue DESC;

* When ready, user can click on the ***Return*** button to return to the **Dashboard** form.

View Groundhog Day Outdoor Furniture Report

Abstract Code

* User clicked on the ***View Groundhog Day Outdoor Furniture Report*** button from the **Dashboard** form.
* Run the **View Groundhog Day Outdoor Furniture Report** task:
* Get the outdoor furniture category (from the CATEGORY table).
* For each year:
  + Find year based on Date (from the SALE table).
    - Find total number of products sold by aggregating Quantity (from the SALE table) in that year.
    - Find average number of products sold per day by dividing total number of products sold by 365.
    - Find total number of products sold on Groundhog Day by aggregating Quantity (from the SALE table) on Feb 2 in that year.
  + Sort by year in ascending order.

SELECT YEAR(Date),

SUM(IFNULL(Quantity, 0)) AS Tot\_Quantity,

(SUM(IFNULL(Quantity, 0)) / 365) AS Avg\_Quantity,

SUM(IF(MONTH(Date)=2 AND DAY(Date)=2,1,0) \* IFNULL(Quantity, 0)) AS GhDay\_Quantity

FROM CATEGORY AS C

LEFT JOIN ASSIGNED AS A ON C.Category\_Name = A.Category\_Name

LEFT JOIN PRODUCT AS P ON A.PID = P.PID

LEFT JOIN SALE AS S ON P.PID = S.PID

WHERE C.Category\_Name = 'Outdoor Furniture'

GROUP BY YEAR(Date)

ORDER BY YEAR(Date) ASC;

* When ready, user can click on the ***Return*** button to return to the **Dashboard** form.

Get Year and Month List

Abstract Code

* User clicked on the ***View State with Highest Volume by Category Report*** button from the **Dashboard** form.
* Run the **Get Year and Month List** task: query for information about the available Year and Month fields from the DAY table.
  + Display Year list in descending order in the drop-down list.

SELECT DISTINCT YEAR(`Date`) AS `Year`

FROM `DAY`

ORDER BY `Year` DESC;

* + Display Monthlist in descending order based on the selected $Year in the drop-down list.

SELECT DISTINCT MONTH(`Date`) AS `Month`

FROM `DAY`

WHERE YEAR(`Date`) = '$Year'

ORDER BY `Month` DESC;

* On the drop-down list, show ***Run Report*** button.
* Upon:
  + Click ***Run Report*** button –
    - If both $Yearand$Month are selected – Jump to the **View State with Highest Volume by Category Report** task.
    - If one or both fields are empty – Display a message asking for user input.
* When ready, user can click on the ***Return*** button to return to the **Dashboard** form.

View State with Highest Volume by Category Report

Abstract Code

* User clicked on the ***Run Report*** button from the drop-down list.
* If data validation is successful for both $Year and $Month input fields, then proceed.
* Run the **View State with Highest Volume by Category Report** task:
  + Based on the selected $Year and $Month,
  + For each category,
    - Find the states that sold the highest number of units in the category.
      * If two or more states tied for having the highest number of units, then display all these states.
    - Display Category\_Name (from the CATEGORY table) and State\_Location (from the STORE table).
    - Find the number of units that were sold by stores in that state by aggregating Quantity (from the SALE table).
* Sort by Category\_Name ascendingly.

SELECT C.Category\_Name, T.State\_Location, SUM(IFNULL(S.Quantity,0)) AS Tot\_UnitSold

FROM CATEGORY AS C

LEFT JOIN ASSIGNED AS A ON C.Category\_Name = A.Category\_Name

LEFT JOIN PRODUCT AS P ON A.PID = P.PID

LEFT JOIN SALE AS S ON P.PID = S.PID AND YEAR(S.`Date`) = '$Year' AND MONTH(S.`Date`) = '$Month'

LEFT JOIN STORE AS T ON S.Store\_Number = T.Store\_Number

GROUP BY C.Category\_Name, T.State\_Location

HAVING Tot\_UnitSold >= ALL

(

SELECT SUM(IFNULL(S2.Quantity,0))

FROM CATEGORY AS C2

LEFT JOIN ASSIGNED AS A2 ON C2.Category\_Name = A2.Category\_Name

LEFT JOIN PRODUCT AS P2 ON A2.PID = P2.PID

LEFT JOIN SALE AS S2 ON P2.PID = S2.PID AND YEAR(S2.`Date`) = '$Year' AND MONTH(S2.`Date`) = '$Month'

LEFT JOIN STORE AS T2 ON S2.Store\_Number = T2.Store\_Number

WHERE C2.Category\_Name = C.Category\_Name

GROUP BY C2.Category\_Name, T2.State\_Location

)

ORDER BY C.Category\_Name ASC;

* When ready, user can click on the ***Return*** button to return to the **Dashboard** form.

View Revenue by Population Report

Abstract Code

* User clicked on the ***View Revenue by Population Report*** button from the **Dashboard** form.
* Run the **View Revenue by Population Report** task:
  + Find the Date, Population, and Total\_Amount from the SALE, STORE, and CITY tables.
  + For each year of Date:
    - Find total revenue for each city size category by aggregating Total\_Amount.
  + Display total revenue based on year and city size category:
    - Row: Years, sorted in ascending order.
    - Column: City size categories, sorted in ascending order. Specifically, SmallCity, MediumCity, LargeCity, and ExtraLargeCity.

SELECT

YEAR(SRC.`Date`) AS Years,

SUM(IF(Population < 3700000, Total\_Amount, 0)) AS SmallCity,

SUM(IF(Population >= 3700000 AND Population < 6700000, Total\_Amount, 0)) AS MediumCity,

SUM(IF(Population >= 6700000 AND Population < 9000000, Total\_Amount, 0)) AS LargeCity,

SUM(IF(Population >= 9000000, Total\_Amount, 0)) AS ExtraLargeCity

FROM (

SELECT

SALE.`Date`,

SALE.Total\_Amount,

CITY.Population

FROM CITY

INNER JOIN STORE ON CITY.State\_Location = STORE.State\_Location AND CITY.City\_Name = STORE.City\_Name

INNER JOIN SALE ON STORE.Store\_Number = SALE.Store\_Number

) AS SRC

GROUP BY YEAR(SRC.`Date`)

ORDER BY YEAR(SRC.`Date`) ASC;

* When ready, user can click on the ***Return*** button to return to the **Dashboard** form.

View Childcare Sales Volume Report

Abstract Code

* User clicked on the ***View Childcare Sales Volume Report*** button from the **Dashboard** form.
* Run the **View Childcare Sales Volume Report** task:
  + Find Childcare\_Category based on Time\_Limit (from the STORE table). If Childcare\_Category doesn’t have a value, set Childcare\_Category to 'No childcare'.
  + For each Sale\_Year\_Month based on `Date` (from the SALE table) in last 12 months:
    - Find the total sales by aggregating Total\_Amount (from the SALE table) in each Childcare\_Category.
* Display total sales based on Sale\_Year\_Month and Childcare\_Category:
  + - Row: Sale\_Year\_Month, sorted in ascending order.
    - Column: Childcare\_Category.

SET @Sql = '';

SELECT @Sql:=CONCAT(@Sql, 'SUM(IF(Childcare\_Category=\'',Childcare\_Category,'\'',',Total\_Amount,0)) AS \'', Childcare\_Category,'\',')

FROM (

SELECT DISTINCT

IF(STORE.Time\_Limit IS NOT NULL, CAST(STORE.Time\_Limit AS CHAR(10)), "No childcare") AS Childcare\_Category

FROM STORE

) AS TL;

SET @Sql = CONCAT('SELECT Sale\_Year\_Month,',LEFT(@Sql, LENGTH(@Sql)-1),'

FROM (

SELECT

DATE\_FORMAT(SALE.`Date`, "%Y-%m") AS Sale\_Year\_Month,

SALE.Total\_Amount AS Total\_Amount,

IF( STORE.Time\_Limit IS NOT NULL, CAST(STORE.Time\_Limit AS CHAR(10)), "No childcare") AS Childcare\_Category

FROM STORE

INNER JOIN SALE ON STORE.Store\_Number = SALE.Store\_Number

WHERE SALE.`Date` >= DATE\_ADD( LAST\_DAY(DATE\_SUB(CURDATE(), INTERVAL 12 MONTH) ), INTERVAL 1 DAY)

) AS REV

GROUP BY Sale\_Year\_Month

ORDER BY Sale\_Year\_Month ASC');

PREPARE stmt FROM @Sql;

EXECUTE stmt;

* When ready, user can click on the ***Return*** button to return to the **Dashboard** form.

View Restaurant Impact on Category Sales Report

Abstract Code

* User clicked on the ***View Restaurant Impact on Category Sales Report*** button from the **Dashboard** form.
* Run the **View Restaurant Impact on Category Sales Report** task:
  + Get Category\_Name that has product(s) assigned (from the CATEGORY, ASSIGNED, and PRODUCT tables) and has sales data (from the SALE table).
  + Get `Store Type` based on Has\_Restaurant (from the STORE table). If Has\_Restaurant is true, set `Store Type` to 'Restaurant', otherwise, set `Store Type` to 'Non-restaurant'.
  + For each Category\_Name and `Store Type`:
    - Include either 'Restaurant' or 'Non-restaurant', even if there’s no sales data.
    - Find `Quantity Sold` by aggregating all products’ Quantity (from the SALE table).
* Sort by Category\_Name ascendingly and then by `Store Type` with 'Non-restaurant' listed first.

SELECT COLS.Category, COLS.`Store Type`, IFNULL(ACT.`Quantity Sold`, 0)

FROM

( ( SELECT C01.Category\_Name AS Category, 'Restaurant' AS `Store Type`

FROM CATEGORY AS C01)

UNION

( SELECT C02.Category\_Name AS Category, 'Non-restaurant' AS `Store Type`

FROM CATEGORY AS C02)

) AS COLS

LEFT JOIN

(SELECT

C.Category\_Name AS Category,

IF(T.Has\_Restaurant IS TRUE, 'Restaurant', 'Non-restaurant') AS `Store Type`, SUM(S.Quantity) AS `Quantity Sold`

FROM CATEGORY AS C

INNER JOIN ASSIGNED AS A ON C.Category\_Name = A.Category\_Name

INNER JOIN PRODUCT AS P ON A.PID = P.PID

INNER JOIN SALE AS S ON P.PID = S.PID

INNER JOIN STORE AS T ON S.Store\_Number = T.Store\_Number

GROUP BY Category, `Store Type`

) AS ACT

ON COLS.Category = ACT.Category AND COLS.`Store Type` = ACT.`Store Type`

ORDER BY COLS.Category ASC, COLS.`Store Type` ASC;

* When ready, user can click on the ***Return*** button to return to the **Dashboard** form.

View Advertising Campaign Analysis Report

Abstract Code

* User clicked on the ***View Advertising Campaign Analysis Report*** button from the **Dashboard** form.
* Run the **View Advertising Campaign Analysis Report** task: query for information if a product has Discount\_Price (from the DISCOUNT table).
  + For each product:
    - Display PID and Product\_Name (from the PRODUCT table).
    - Find total quantity sold during campaign by aggregating Quantity (from the SALE table) in all discount sale days when any advertising campaign was active.
    - Find total quantity sold outside campaign by aggregating Quantity (from the SALE table) in all discount sale days when no advertising campaign was active.
    - Find the difference by subtracting quantity sold outside campaign from quantity sold during campaign.
* Sort by difference in descending order and only display the top 10 followed by the bottom 10.

SELECT `Product ID`, `Product Name`, `Sold During Campaign`, `Sold Outside Campaign`, Difference

FROM(

(

SELECT P.PID AS `Product ID`, P.Product\_Name AS `Product Name`,

SUM(IF(A.`Description` IS NULL,0,1) \* IFNULL(S.Quantity,0)) AS `Sold During Campaign`,

SUM(IF(A.`Description` IS NULL,1,0) \* IFNULL(S.Quantity,0)) AS `Sold Outside Campaign`,

(SUM(IF(A.`Description` IS NULL,0,1) \* IFNULL(S.Quantity,0)) -

SUM(IF(A.`Description` IS NULL,1,0) \* IFNULL(S.Quantity,0))) AS Difference

FROM PRODUCT AS P

INNER JOIN DISCOUNT AS I ON P.PID = I.PID

LEFT JOIN SALE AS S ON I.`Date` = S.`Date` AND I.PID = S.PID

LEFT JOIN DAY AS D ON S.`Date` = D.`Date`

LEFT JOIN HOLD AS H ON D.`Date` = H.`Date`

LEFT JOIN ADVERTISING\_CAMPAIGN AS A ON H.`Description` = A.`Description`

GROUP BY `Product ID`

ORDER BY Difference DESC

LIMIT 10

)

UNION

(

SELECT P2.PID AS `Product ID`, P2.Product\_Name AS `Product Name`,

SUM(IF(A2.`Description` IS NULL,0,1) \* IFNULL(S2.Quantity,0)) AS `Sold During Campaign`,

SUM(IF(A2.`Description` IS NULL,1,0) \* IFNULL(S2.Quantity,0)) AS `Sold Outside Campaign`,

(SUM(IF(A2.`Description` IS NULL,0,1) \* IFNULL(S2.Quantity,0)) -

SUM(IF(A2.`Description` IS NULL,1,0) \* IFNULL(S2.Quantity,0))) AS Difference

FROM PRODUCT AS P2

INNER JOIN DISCOUNT AS I2 ON P2.PID = I2.PID

LEFT JOIN SALE AS S2 ON I2.`Date` = S2.`Date` AND I2.PID = S2.PID

LEFT JOIN DAY AS D2 ON S2.`Date` = D2.`Date`

LEFT JOIN HOLD AS H2 ON D2.`Date` = H2.`Date`

LEFT JOIN ADVERTISING\_CAMPAIGN AS A2 ON H2.`Description` = A2.`Description`

GROUP BY `Product ID`

ORDER BY Difference ASC

LIMIT 10

)

) AS UN

ORDER BY Difference DESC;

* When ready, user can click on the ***Return*** button to return to the **Dashboard** form.

1. MySQL is applied to our submission. [↑](#footnote-ref-1)