

Analyze Data in a Model Car Database with MySQL Workbench

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Overview

In this project, I will need to step into the shoes of an entry-level data analyst at the fictional Mint Classics Company, helping to analyze data in a relational database with the goal of supporting inventory-related business decisions that lead to the closure of a warehouse.

Goals

1. **Find which warehouse to eliminate:** I need to find out which warehouse would make the most sense to close. This means I need to find each warehouse's total capacity, their current capacity, and I need them to reach the ideal capacity of 80%
2. **Find which products to eliminate:** To ensure proper room in the warehouse that will take on the stock of the closed warehouse, I need to find out which products would make the most sense to eliminate.

Milestones

1. Calculate Warehouse Capacity

I need to find out the current capacity in percentage and in units. I then need to find out how many units each warehouse can hold at 80% capacity. This will help us determine which warehouses make sense to combine

2. Find which Warehouse to combine

Analyze the findings and choose which warehouse to eliminate and which warehouse you need to combine this one into. Provide an explanation as to why you chose to combine these warehouses.

3. Find which Products to Eliminate

The company will need to eliminate some products, either by having a sale or by some other means. I need to find out which products we need to eliminate.

4. Provide a Possible Solution on How to Eliminate These Products

Based on which products to eliminate, I need to provide the company with a possible solution as to how to best get rid of these products.

Solution

Using SQL and the power of stats, I concluded that the warehouse that needs to be eliminated is the South warehouse and should be combined with the West warehouse, as this combination leaves the least amount of waste.

Furthermore, I concluded that the three products the company should consider eliminating are S18_4409, S32_1268, and S700_3962 as the current stock of these products greatly outweighs their demand.

I suggest running a flash sale on these products in the businesses that currently sell them at the highest profit margin. The company could also run a PPC promotion for people who search for these types of products. This promotion could be a 'First-time customer special price,' a 'New user discount,' etc. To best accomplish this, I suggest slowly decreasing the price, being sure to remain above a 20% profit margin until we can eliminate as many products as possible.

Aside from a flash sale, we could offer a special "Customer Appreciation" price to the customers that habitually buy these products. As long as we aim to stay above a 20% profit margin, we should be able to combine the warehouses, make some people happy by saving them money, and not need to completely eliminate a product line completely.

Analysis Section

This section shows my work using paper and SQL on MySQL

Warehouses: (b) East @ 67% Capacity (219,183) @ 100% = 327,138 @ 80% = 261,710
 (a) North @ 72% Capacity (131,688) @ 100% = 182,900 @ 80% = 146,320
 Vintage Cars (c) West @ 50% Capacity (124,886) @ 100% = 249,760 @ 80% = 199,808
 (d) South @ 75% Capacity (79,380) @ 100% = 105,840 @ 80% = 84,672

Extra 89,171 = 350,871 - 261,700 ← b + a a+b c+d d+b
 Extra 22,483 = 344,063 - 321,700 ← b + c a+c c+a d+a
 Extra 56,863 = 298,563 - 241,700 ← b + d a+d c+b d+c
 move into b

Extra 204,551 = 350,871 - 146,320 move
 Extra 110,248 = 256,568 - 146,320 - into a
 Extra 64,748 = 211,068 - 146,320 move
 * Extra 4,452 = 204,260 - 199,808 move
 Extra 56,740 = 256,568 - 199,808 - into c
 Extra 144,255 = 344,063 - 199,808 move
 Extra 213,891 = 298,568 - 84,672 move
 Extra 126,396 = 211,068 - 84,672 - into d
 Extra 119,588 = 204,260 - 84,672 move

- Move the Southware house into the West warehouse. Will only give us 4,452 extra units that we need to get rid of.
- We need to eliminate products from the West and the South. Which are these productlines: Vintage Cars, Ships, Trains, Trucks + buses
- What are the Top 5 worst performing products from each warehouse.

West (Vintage Cars)

Product Code	Qty. Ordered	Frgcy. Ordered	Qty. in Stock
*1) S24-3969	824	25	2081
2) S18-2248	832	25	540
*3) S18-4409	866	25	6553
4) S18-2795	880	28	548
5) S18-3140	883	27	3,913

South (Trucks and buses, ships)

Product Code	Qty. Ordered	Frgcy. Ordered	Qty. in Stock
* S 1) S700-3962	896	27	5,088
* S 2) S700-2047	897	28	3,501
S 3) S700-1938	898	27	737
* T/B 4) S32-1268	911	28	5,099
S 5) S700-1138	934	27	1,897

Products to Further Investigate: #s reflect products life @ company

Code	Current Stock	Total Qty Ordered	Avg. Qty Ordered	Largest Qty Ordered	Smallest Qty Ordered
Sa4-3969	2,081	824	33	49	15
S18-4409	6,553	806	35	66	6
S32-1268	5,099	911	33	49	20
S700-3962	5,088	896	33	50	20
S700-2047	3,501	897	32	55	20

Reduce the current stock of these 3 products

S18-4409, S32-1268, S700-3962

need to get rid of: 4,452

Getting rid of: 6,000

(vc) • S18-4409 goes from 6,553 → 4,553 (-2,000)

(T/B) • S32-1268 goes from 5,099 → 3,099 (-2,000)

(S) • S700-3962 goes from 5,088 → 3,088 (-2,000)

$$PM = \frac{\text{sell} - \text{buy}}{\text{sell}}$$

Pricing of these 3 items

Product Code	total Stock	Buy Price	Sell Price	MSRP	lowest Profit margin	highest P.M.
S18-4409	6,553	43.26	73.62 - 92.03	92.03	41%, \$30.36	53%, \$48.77
S32-1268	5,099	53.93	77.05 - 96.31	96.31	30%, \$23.12	44%, \$42.38
S700-3962	5,088	53.63	80.44 - 99.31	99.31	33%, \$26.81	46%, \$45.68

Ensure Profit margin is at least 20%.

Would put products @ the higher P.M. on sale first (try to match the lowest P.M.)

→ See how well people respond before going lower

→ Have sale run for a set period of time, only decreasing price when responses stagnate, once sold the 6,000 units needed set price to normal again.

Completed and Organized SQL Code

```
/*
```

```
Open the Mint Classics Database to start using it
```

```
*/
```

```
USE mintclassics;
```

```
# WAREHOUSE SECTION: This section is about discovering which warehouse to  
eliminate and how to eliminate it
```

```
/*
```

```
Find the total amount of space each warehouse has, as well as the number of products  
stocked in each warehouse
```

```
*/
```

```
SELECT
```

```
    SUM(p.quantityInStock) AS total_amount_of_products_in_stock,
```

```
    w.warehouseCode,
```

```
    w.warehousePctCap,
```

```
    w.warehouseName
```

```
FROM
```

```
    products p
```

JOIN

warehouses w ON w.warehouseCode = p.warehouseCode

GROUP BY warehouseCode

ORDER BY total_amount_of_products_in_stock ASC;

/* The West warehouse is currently at 50% capacity, meaning it will be the easiest one to potentially combine another warehouse into.

I need to find out how many units each warehouse can hold at 80% capacity, which means I need to find out how many units each warehouse holds at 100% capacity.

The following table will show:

Total Amount of Products in Stock

Unit Count at Full Capacity

Unit Count at Ideal Capacity

*/

SELECT

warehouseName,

total_amount_of_products_in_stock,

full_capacity,

(full_capacity * CAST(80 AS DECIMAL (10 , 2))) AS ideal_capacity

FROM

(SELECT

```

total_amount_of_products_in_stock,

(total_amount_of_products_in_stock / CAST(warehousePctCap AS
DECIMAL(10,2))) AS full_capacity,

```

#above there's an error that keeps showing the full capacity with the decimal one over to the left. Move the decimal to the right for the correct quantity

```

        warehouseName

FROM

(SELECT

SUM(p.quantityInStock) AS total_amount_of_products_in_stock,

        w.warehouseCode,

        w.warehousePctCap,

        w.warehouseName

FROM

        products p

JOIN warehouses w ON w.warehouseCode = p.warehouseCode

GROUP BY w.warehouseCode

ORDER BY total_amount_of_products_in_stock ASC) AS A) AS B;

```

/* From here, I did a bit of math to find out which warehouse combination makes sense.

I added each warehouse's current units together, took those units, and subtracted that from the ideal_capacity amount of units

Doing so shows that combining the South and West warehouses. Doing this will leave only 4,452 extra units to take care of.

Look at external notes

*/

#PRODUCT LINE SECTION: Now we need to find out which products we need to eliminate

/*

Since we are combining the West and the South warehouses, we need to eliminate products from these departments.

The product lines from these warehouses are as follows:

Vintage Cars (VC)

Ships (S)

Trucks and Buses (TB)

*/

/* This code chunk will show the:

Current Quantity in Stock

Total Order Quantity

Average Order Quantity

The Largest Quantity Ordered

The Smallest Quantity Ordered

*/


```
SELECT

    p.productCode,

    p.productName,

    p.quantityInStock,

    p.productLine,

    SUM(od.quantityOrdered) AS totalOrderedQuantity,

    AVG (od.quantityOrdered) AS avgOrderedQuantity,

    MAX(od.quantityOrdered) AS LargestQuantityOrdered,

    MIN(od.quantityOrdered) AS SmallestQuantityOrdered

FROM

    products p

    JOIN

        orderdetails od ON od.productCode = p.productCode

WHERE productLine = 'Vintage Cars'

OR productLine = 'Ships'

OR productLine = 'Trucks and Buses'

GROUP BY p.productCode , p.productName , p.quantityInStock

ORDER BY totalOrderedQuantity ASC;
```

/* After looking through the data, I believe that these are the top 5 products to further investigate.

These products have a high inventory count, the total amount of orders for these products is under 1,000, and they average from 32-35 units ordered

S24_3969

S18_4409

S32_1268

S700_3962

S700_2047

*/

SELECT

p.productCode,

p.productName,

p.quantityInStock,

SUM(od.quantityOrdered) AS totalOrderedQuantity,

AVG (od.quantityOrdered) AS avgOrderedQuantity,

MAX(od.quantityOrdered) AS LargestQuantityOrdered,

MIN(od.quantityOrdered) AS SmallestQuantityOrdered

FROM

products p

JOIN

```
orderdetails od ON od.productCode = p.productCode

WHERE

p.productCode = 'S24_3969'

OR p.productCode = 'S18_4409'

OR p.productCode = 'S32_1268'

OR p.productCode = 'S700_3962'

OR p.productCode = 'S700_2047'

GROUP BY p.productCode , p.productName , p.quantityInStock

ORDER BY quantityInStock ASC;

/*
```

I would recommend getting rid of 2,000 of each of the following units:

S18_4409

S32_1268

S700_3962

They have the highest amount in stock, but the average, largest, and smallest order quantities that these products receive do not justify their excessive quantity in our warehouses.

I suggest eliminating at least 2,000 units from each of these lines to have a more manageable stock of each product line.

I want to see a potential markdown price that we can run as a special for customers that order these products the most, as well as a potential 'New Customer' offering that we can create either PPC ads around or a social media campaign.

This means I will need to see our buy price, sell price, MSRP, and brainstorm a markdown % price.

*/

```
SELECT DISTINCT
    p.productCode,
    p.productName,
    od.`priceEACH`,
    p.MSRP,
    p.buyPrice
FROM
    products p
    JOIN
        orderdetails od ON od.productCode = p.productCode
WHERE
    p.productCode = 'S18_4409'
    OR p.productCode = 'S32_1268'
    OR p.productCode = 'S700_3962'
ORDER BY priceEACH ASC;
```

#Finding the Max and Min Profit Margins in PERCENTAGE (%) of the following productCodes: S18_4409 S32_1268 S700_3962

```
SELECT

    MIN(profit_margin) AS 'lowest_profit_margin_%',

    MAX(profit_margin) AS 'highest_profit_margin_%'

FROM

    (SELECT

        (od.`priceEACH` - p.buyPrice) / od.`priceEACH` * 100 AS profit_margin

    FROM

        products p

    JOIN orderdetails od ON od.productCode = p.productCode

    WHERE

        p.productCode = 'S32_1268') AS t;
```

#Finding the Max and Min Profit Margins in USD (\$) of the following productCodes:
S18_4409 S32_1268 S700_3962

```
SELECT

    MIN(profit_margin_USD) AS lowest_profit_margin_USD,

    MAX(profit_margin_USD) AS highest_profit_margin_USD

FROM

    (SELECT

        od.`priceEACH` - p.buyPrice AS profit_margin_USD

    FROM
```

```
products p
JOIN orderdetails od ON od.productCode = p.productCode
WHERE
    p.productCode = 'S700_3962') AS t;
```

/*

There are several options on how to handle the 6,000 units that we aim to get rid of.

As long as we aim to stay above a 20% profit margin, we should be able to combine the warehouses, make some people happy by saving them money, and not need to completely eliminate a product line completely.

I would love your feedback on my scripts as I am a novice analyst! Thank you!!

*/