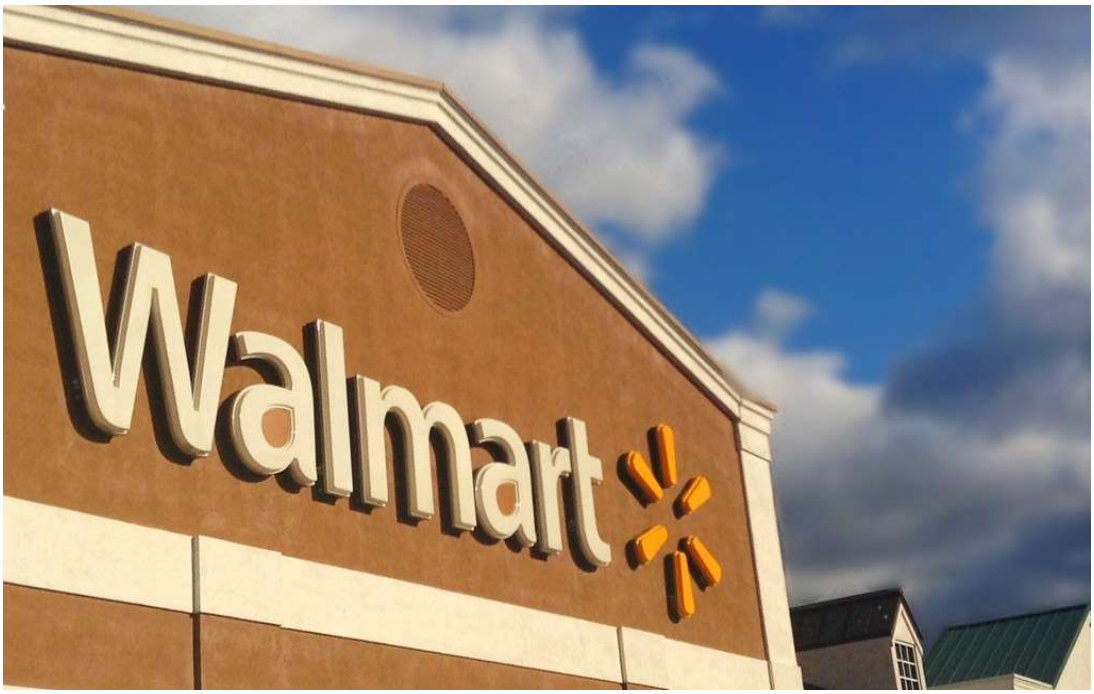
Walmart Data Analysis Using MySQL:



Introductions:

Walmart, a global retail giant, is known for its wide range of products and focus on affordability. Walmart operates a vast network of stores, including supermarkets, discount stores, and grocery stores. Walmart's mission is to help people save money and live better.

In this project, we're diving into Walmart's sales data to uncover key insights.

1.We'll be analyzing sales by branch, product lines, and payment methods.

2.We'll also explore gross income, customer behavior, and transaction patterns across different cities and timeframes. Our goal is to understand sales performance better and identify opportunities for growth.

Steps:

Create a Database:

```
create database walmart_schema;
```

Import Data:

1. **Select Database:** In the left panel, choose your database, right-click, and select **Table Data Import Wizard**.
2. **Import CSV:** Browse and select your CSV file, map the columns, and click "Next" to start the import.

3. Retrieving Data from the table:

Select statement:

```
SELECT
        *
FROM
        walmart data;
```

3. Data Type Changes:

Date formate:

```
UPDATE walmartdata
SET date = STR_TO_DATE(date, '%Y-%m-%d');
```

Changing Data type for Date column text to Date

```
ALTER TABLE walmartdata
MODIFY COLUMN date DATE;
```

Changing Data types for columns in the table:

```
ALTER TABLE walmartdata
MODIFY COLUMN Invoice_ID varchar(100),
MODIFY COLUMN Branch varchar(100),
MODIFY COLUMN City varchar(100),
```

```
MODIFY COLUMN Customer_type varchar(100),
MODIFY COLUMN Gender varchar(100),
MODIFY COLUMN Product_line varchar(100),
MODIFY COLUMN Unit_price decimal(10,2),
MODIFY COLUMN `Tax_5%` decimal(10,4),
MODIFY COLUMN Total decimal(10,3),
MODIFY COLUMN `Time` TIME,
MODIFY COLUMN Payment varchar(100),
MODIFY COLUMN cogs decimal(10,3),
MODIFY COLUMN gross_margin_percentage decimal(10,1),
MODIFY COLUMN gross_income decimal(10,1),
MODIFY COLUMN Rating decimal(10,1)
;
```

Queries:

1. **Retrieve all columns for sales made in a specific branch (e.g., Branch 'A').**

```
SELECT
        *
FROM
        walmartdata
WHERE
        Branch="A";
```

Results:

Invoice_ID	Branch	City	Customer_type	Gender	Product_line	Unit_price	Quantity	Tax_5%	Total	date	Time	Payment	cogs
750-67-8428	A	Yangon	Member	Female	Health and beauty	74.69	7	26.1415	548.972	2019-01-05	13:08:00	Ewallet	522.830
631-41-3108	A	Yangon	Normal	Male	Home and lifestyle	46.33	7	16.2155	340.526	2019-03-03	13:23:00	Credit card	324.310
123-19-1176	A	Yangon	Member	Male	Health and beauty	58.22	8	23.2880	489.048	2019-01-27	20:33:00	Ewallet	465.760
373-73-7910	A	Yangon	Normal	Male	Sports and travel	86.31	7	30.2085	634.379	2019-02-08	10:37:00	Ewallet	604.170
355-53-5943	A	Yangon	Member	Female	Electronic accessories	68.84	6	20.6520	433.692	2019-02-25	14:36:00	Ewallet	413.040
665-32-9167	A	Yangon	Member	Female	Health and beauty	36.26	2	3.6260	76.146	2019-01-10	17:15:00	Credit card	72.520
365-64-0515	A	Yangon	Normal	Female	Electronic accessories	46.95	5	11.7375	246.488	2019-02-12	10:25:00	Ewallet	234.750
252-56-2699	A	Yangon	Normal	Male	Food and beverages	43.19	10	21.5950	453.495	2019-02-07	16:48:00	Ewallet	431.900
829-34-3910	A	Yangon	Normal	Female	Health and beauty	71.38	10	35.6900	749.490	2019-03-29	19:21:00	Cash	713.800
656-95-9349	A	Yangon	Member	Female	Health and beauty	68.93	7	24.1255	506.636	2019-03-11	11:03:00	Credit card	482.510
765-26-6951	A	Yangon	Normal	Male	Sports and travel	72.61	6	21.7830	457.443	2019-01-01	10:39:00	Credit card	435.660
329-62-1586	A	Yangon	Normal	Male	Food and beverages	54.67	3	8.2005	172.211	2019-01-21	18:00:00	Credit card	164.010
636-48-8204	A	Yangon	Normal	Male	Electronic accessories	34.56	5	8.6400	181.440	2019-02-17	11:15:00	Ewallet	172.800
549-59-1358	A	Yangon	Member	Male	Sports and travel	88.63	3	13.2945	279.185	2019-03-02	17:36:00	Ewallet	265.890
227-03-5010	A	Yangon	Member	Female	Home and lifestyle	52.59	8	21.0360	441.756	2019-03-22	19:20:00	Credit card	420.720
189-17-4241	A	Yangon	Normal	Female	Fashion accessories	87.67	2	8.7670	184.107	2019-03-10	12:17:00	Credit card	175.340
848-62-7243	A	Yangon	Normal	Male	Health and beauty	24.89	9	11.2005	235.211	2019-03-15	15:36:00	Cash	224.010
595-11-5460	A	Yangon	Normal	Male	Health and beauty	96.58	2	9.6580	202.818	2019-03-15	10:12:00	Credit card	193.160

2. **Find the total sales for each product line.**

```
SELECT
        Product_line,
        round(SUM(total),2) AS total_sales
 FROM
        walmartdata
GROUP BY
         product_line;
```

Results:

Product_line	total_sales
Health and beauty	49193.76
Electronic accessories	54337.55
Home and lifestyle	53861.93
Sports and travel	55122.85
Food and beverages	56144.86
Fashion accessories	54305.92

3. **List all sales transactions where the payment method was 'Cash'.**

```
SELECT
        *
FROM
        walmartdata
WHERE
        Payment="Cash";
```

Results:

Invoice_ID	Branch	City	Customer_type	Gender	Product_line	Unit_price	Quantity	Tax_5%	Total	date	Time	Payment
226-31-3081	C	Naypyitaw	Normal	Female	Electronic accessories	15.28	5	3.8200	80.220	2019-03-08	10:29:00	Cash
529-56-3974	B	Mandalay	Member	Male	Electronic accessories	25.51	4	5.1020	107.142	2019-03-09	17:03:00	Cash
829-34-3910	A	Yangon	Normal	Female	Health and beauty	71.38	10	35.6900	749.490	2019-03-29	19:21:00	Cash
299-46-1805	B	Mandalay	Member	Female	Sports and travel	93.72	6	28.1160	590.436	2019-01-15	16:19:00	Cash
649-29-6775	B	Mandalay	Normal	Male	Fashion accessories	33.52	1	1.6760	35.196	2019-02-08	15:31:00	Cash
145-94-9061	B	Mandalay	Normal	Female	Food and beverages	88.36	5	22.0900	463.890	2019-01-25	19:48:00	Cash
848-62-7243	A	Yangon	Normal	Male	Health and beauty	24.89	9	11.2005	235.211	2019-03-15	15:36:00	Cash
149-71-6266	B	Mandalay	Member	Male	Sports and travel	78.07	9	35.1315	737.762	2019-01-28	12:43:00	Cash
640-49-2076	B	Mandalay	Normal	Male	Sports and travel	83.78	8	33.5120	703.752	2019-01-10	14:49:00	Cash
777-82-7220	B	Mandalay	Member	Male	Home and lifestyle	30.12	8	12.0480	253.008	2019-03-03	13:01:00	Cash
554-53-8700	C	Naypyitaw	Member	Male	Home and lifestyle	56.11	2	5.6110	117.831	2019-02-02	10:11:00	Cash
354-25-5821	B	Mandalay	Member	Female	Sports and travel	69.12	6	20.7360	435.456	2019-02-08	13:03:00	Cash
228-96-1411	C	Naypyitaw	Member	Female	Food and beverages	98.70	8	39.4800	829.080	2019-03-04	20:39:00	Cash
617-15-4209	C	Naypyitaw	Member	Male	Health and beauty	15.37	2	1.5370	32.277	2019-03-16	19:47:00	Cash
132-32-9879	B	Mandalay	Member	Female	Electronic accessories	93.96	4	18.7920	394.632	2019-03-09	18:00:00	Cash
326-78-5178	C	Naypyitaw	Member	Male	Food and beverages	91.40	7	31.9900	671.790	2019-02-03	10:19:00	Cash
162-48-8011	A	Yangon	Member	Female	Food and beverages	44.59	5	11.1475	234.098	2019-02-10	15:10:00	Cash

4. Calculate the total gross income generated in each city.

```
SELECT
        City,
        round(sum(gross_income),2) as Total_gross_income
FROM
       walmartdata
GROUP BY
            City;
```

Results:

City	Total_gross_income
Yangon	5057.2
Naypyitaw	5265.4
Mandalay	5056.9

5. Find the average rating given by customers in each branch.

```
SELECT
        Branch,
        round(avg(Rating),1) as Average_rating
FROM
        walmartdata
GROUP BY
             Branch
ORDER BY
              Branch;
```

Results:

Branch	Average_rating
A	7.0
B	6.8
C	7.1

6. **Determine the total quantity of each product line sold.**

```
SELECT
        Product_line,
        sum(Quantity) as Total_Quantity
FROM
        walmartdata
GROUP BY
          Product_line;
```

Results:

Product_line	Total_Quantity
Health and beauty	854
Electronic accessories	971
Home and lifestyle	911
Sports and travel	920
Food and beverages	952
Fashion accessories	902

7. **List the top 5 products by unit price.**

```
SELECT
        Product_line,
        Max(Unit_price) as Maximum_Unit_Price
FROM
        walmartdata
GROUP BY
          Product_line
ORDER BY
           Maximum_Unit_price Desc
LIMIT 5;
```

Results:

Product_line	Maximum_Unit_Price
Health and beauty	99.96
Sports and travel	99.96
Home and lifestyle	99.92
Fashion accessories	99.89
Food and beverages	99.79

8. Find sales transactions with a gross margin percentage greater than 30%.

```
SELECT *
FROM walmartdata
WHERE gross_margin_percentage > 30;
```

Results:

Invoice_ID	Branch	City	Customer_type	Gender	Product_line	Unit_price	Quantity	Tax_5%	Total	date	Time	Payment

9. Retrieve sales transactions that occurred on weekends.

```
SELECT
        *
FROM
        walmartdata
WHERE
        DAYOFWEEK(STR_TO_DATE(`Date`, '%Y-%m-%d')) IN (1, 7);
```

Results:

Invoice_ID	Branch	City	Customer_type	Gender	Product_line	Unit_price	Quantity	Tax_5%	Total	date	Time	Payment
750-67-8428	A	Yangon	Member	Female	Health and beauty	74.69	7	26.1415	548.972	2019-01-05	13:08:00	Ewallet
631-41-3108	A	Yangon	Normal	Male	Home and lifestyle	46.33	7	16.2155	340.526	2019-03-03	13:23:00	Credit card
123-19-1176	A	Yangon	Member	Male	Health and beauty	58.22	8	23.2880	489.048	2019-01-27	20:33:00	Ewallet
315-22-5665	C	Naypyitaw	Normal	Female	Home and lifestyle	73.56	10	36.7800	772.380	2019-02-24	11:38:00	Ewallet
529-56-3974	B	Mandalay	Member	Male	Electronic accessories	25.51	4	5.1020	107.142	2019-03-09	17:03:00	Cash
636-48-8204	A	Yangon	Normal	Male	Electronic accessories	34.56	5	8.6400	181.440	2019-02-17	11:15:00	Ewallet
549-59-1358	A	Yangon	Member	Male	Sports and travel	88.63	3	13.2945	279.185	2019-03-02	17:36:00	Ewallet
189-17-4241	A	Yangon	Normal	Female	Fashion accessories	87.67	2	8.7670	184.107	2019-03-10	12:17:00	Credit card
129-29-8530	A	Yangon	Member	Male	Sports and travel	62.62	5	15.6550	328.755	2019-03-10	19:15:00	Ewallet
333-73-7901	C	Naypyitaw	Normal	Female	Health and beauty	54.92	8	21.9680	461.328	2019-03-23	13:24:00	Ewallet
777-82-7220	B	Mandalay	Member	Male	Home and lifestyle	30.12	8	12.0480	253.008	2019-03-03	13:01:00	Cash

10. Calculate the total sales and gross income for each month.

```
SELECT
        DATE_FORMAT(STR_TO_DATE(`Date`,'%Y-%m-%d'),'%Y-%m')AS Month_Year,
        SUM(Total) AS Total_Sales,
        SUM(gross_income) AS Total_Gross_Income
FROM
        walmartdata
GROUP BY
        DATE_FORMAT(STR_TO_DATE(`Date`, '%Y-%m-%d'),'%Y-%m')
ORDER BY
        Month_Year;
```

Results:

Month_Year	Total_Sales	Total_Gross_Income
2019-01	116291.912	5537.3
2019-02	97219.411	4628.9
2019-03	109455.543	5213.3

11. Find the number of sales transactions that occurred after 6 PM.

```
SELECT
        count(*) as Transaction_After_6PM
FROM
        walmartdata
WHERE
        Time(`Time`) >'18:00:00';
```

Results:

Transaction_After_6PM
279

12. List the sales transactions that have a higher total than the average total of all transactions.

```
WITH AvgTotal AS (
    SELECT
        AVG(Total) AS Average_Total
    FROM
        walmartdata
)
  SELECT
      *
  FROM
      walmartdata
  WHERE
      Total > (SELECT Average_Total FROM AvgTotal);
```

Results:

Invoice_ID	Branch	City	Customer_type	Gender	Product_line	Unit_price	Quantity	Tax_5%	Total	date	Time	Payment
750-67-8428	A	Yangon	Member	Female	Health and beauty	74.69	7	26.1415	548.972	2019-01-05	13:08:00	Ewallet
631-41-3108	A	Yangon	Normal	Male	Home and lifestyle	46.33	7	16.2155	340.526	2019-03-03	13:23:00	Credit card
123-19-1176	A	Yangon	Member	Male	Health and beauty	58.22	8	23.2880	489.048	2019-01-27	20:33:00	Ewallet
373-73-7910	A	Yangon	Normal	Male	Sports and travel	86.31	7	30.2085	634.379	2019-02-08	10:37:00	Ewallet
699-14-3026	C	Naypyitaw	Normal	Male	Electronic accessories	85.39	7	29.8865	627.617	2019-03-25	18:30:00	Ewallet
355-53-5943	A	Yangon	Member	Female	Electronic accessories	68.84	6	20.6520	433.692	2019-02-25	14:36:00	Ewallet
315-22-5665	C	Naypyitaw	Normal	Female	Home and lifestyle	73.56	10	36.7800	772.380	2019-02-24	11:38:00	Ewallet
252-56-2699	A	Yangon	Normal	Male	Food and beverages	43.19	10	21.5950	453.495	2019-02-07	16:48:00	Ewallet
829-34-3910	A	Yangon	Normal	Female	Health and beauty	71.38	10	35.6900	749.490	2019-03-29	19:21:00	Cash
299-46-1805	B	Mandalay	Member	Female	Sports and travel	93.72	6	28.1160	590.436	2019-01-15	16:19:00	Cash
656-95-9349	A	Yangon	Member	Female	Health and beauty	68.93	7	24.1255	506.636	2019-03-11	11:03:00	Credit card
765-26-6951	A	Yangon	Normal	Male	Sports and travel	72.61	6	21.7830	457.443	2019-01-01	10:39:00	Credit card
300-71-4605	C	Naypyitaw	Member	Male	Electronic accessories	86.04	5	21.5100	451.710	2019-02-25	11:24:00	Ewallet
227-03-5010	A	Yangon	Member	Female	Home and lifestyle	52.59	8	21.0360	441.756	2019-03-22	19:20:00	Credit card

13. Find customers who made more than 5 purchases in a single month.

```
WITH MonthlyPurchases AS (
        SELECT
                Customer_type,
                DATE_FORMAT(`DATE`, '%Y-%m') AS Purchase_Month,
                COUNT(*) AS Purchases
        FROM
                walmartdata
        GROUP BY
                 Customer_type,
                 DATE_FORMAT(`DATE`, '%Y-%m')
 )
    SELECT
            Customer_type,
            Purchase_Month,
            Purchases
     FROM
          MonthlyPurchases
    WHERE
            Purchases > 5
ORDER BY
            Customer_type,
           Purchase_Month;
```

Results:

Customer_type	Purchase_Month	Purchases
Member	2019-01	172
Member	2019-02	163
Member	2019-03	166
Normal	2019-01	180
Normal	2019-02	140
Normal	2019-03	179

14. Calculate the cumulative gross income for each branch by date.

```
SELECT
        Branch,
        `date`,
        gross_income,
        SUM(gross_income) OVER (PARTITION BY Branch ORDER BY `date`)
AS Cumulative_Gross_Income

FROM
        walmartdata
ORDER BY
        Branch, `date`;
```

Results:

Branch	date	gross_income	Cumulative_Gross_Income
A	2019-01-01	21.8	112.9
A	2019-01-01	19.0	112.9
A	2019-01-01	5.4	112.9
A	2019-01-01	29.6	112.9
A	2019-01-01	37.1	112.9
A	2019-01-02	12.5	127.5
A	2019-01-02	2.1	127.5
A	2019-01-03	16.8	172.2
A	2019-01-03	17.5	172.2
A	2019-01-03	10.4	172.2
A	2019-01-04	17.8	195.2
A	2019-01-04	5.2	195.2
A	2019-01-05	26.1	291.5
A	2019-01-05	12.5	291.5

Branch	date	gross_income	Cumulative_Gross_Income
B	2019-01-01	8.4	73.1
B	2019-01-01	42.3	73.1
B	2019-01-01	22.4	73.1
B	2019-01-02	13.4	128.5
B	2019-01-02	17.1	128.5
B	2019-01-02	6.6	128.5
B	2019-01-02	18.3	128.5
B	2019-01-03	24.8	176.9
B	2019-01-03	4.7	176.9
B	2019-01-03	18.9	176.9
B	2019-01-04	3.6	201.2
B	2019-01-04	13.7	201.2
B	2019-01-04	7.0	201.2
B	2019-01-05	15.9	224.4

Branch	date	gross_income	Cumulative_Gross_Income
C	2019-01-01	18.5	39.9
C	2019-01-01	6.3	39.9
C	2019-01-01	8.8	39.9
C	2019-01-01	6.3	39.9
C	2019-01-02	12.7	62.6
C	2019-01-02	10.0	62.6
C	2019-01-03	3.8	68.5
C	2019-01-03	2.1	68.5
C	2019-01-04	30.0	98.5
C	2019-01-05	27.6	147.3
C	2019-01-05	1.6	147.3
C	2019-01-05	8.2	147.3
C	2019-01-05	11.4	147.3
C	2019-01-06	16.3	208.3

15. Find the total cogs for each customer type in each city.

```
SELECT
        City,
        Customer_type,
        round(sum(cogs),2) as Total_cogs
FROM
       walmartdata
GROUP BY
        City,
        Customer_type
ORDER BY
        City,
        Customer_type;
```

Results:

city	Customer_type	Total_cogs
Mandalay	Member	51147.32
Mandalay	Normal	49993.32
Naypyitaw	Member	54172.65
Naypyitaw	Normal	51130.88
Yangon	Member	51083.31
Yangon	Normal	50059.90

Insights:

1.**Branch Transactions:**

- **Top:** Branch A has the most transactions, showing strong customer engagement.
- **Lowest:** Branch C has the fewest transactions, indicating less customer activity.

2. **Branch Rankings:**

- **Highest:** Branch C (7.1) has the best customer satisfaction rating.
- **Lowest:** Branch B (6.8) has a lower rating, suggesting a need for improvement.

3. **Product Line Sales:**

- **Top:** Electronics and Accessories sold the most units (971), showing high demand.
- **Lowest:** Health and Beauty sold the fewest units, indicating lower interest or potential inventory issues.

4. **Gross Income by City:**

- **Highest:** Naypyitaw earned $5,265.40, reflecting strong performance.
- **Lowest:** Yangon earned $5,057.20, showing potential for growth.

5. **Cash Transactions:** Heavy reliance on cash may suggest customer preferences or limited use of digital payments.

6. **Weekend Activity:** 297 transactions occurred on weekends, indicating high customer activity.

7. **Monthly Sales:**

- **Top:** January 2019 had the highest sales ($116,291.91) and gross income ($5,537.30).
- **Lowest:** February 2019 had the lowest sales ($97,219.41) and gross income ($4,628.90).

8. Customer Purchases Analysis: Normal customer purchases peaked in January, dropped in February, and then rose again in March. Member purchases saw a decrease in February but recovered in March.

Recommendations:

- **Boost February Sales:** Run promotions to increase sales during the low February period.
- **Improve Branch B:** Apply successful strategies from Branch C to enhance Branch B's performance.
- **Enhance Yangon Sales:** Increase marketing efforts to grow sales in Yangon.
- **Optimize Weekends:** Increase staffing and inventory for the high weekend transaction volume.
- **Promote High Performers:** Focus on selling Electronics and Accessories more, and improve Health and Beauty sales.
- **Adjust Strategies Regularly:** Continuously monitor sales data and adjust strategies to improve performance.