

Machine Learning Project

Kalbe Nutritional Data Scientist

Presented by
Gilang Muhamad Rizky



Gilang Muhamad Rizky

About You

- Freshgraduate from Telkom University
- Data Enthusiast
- Aspiring Data analyst & Data Science

Experience & Project

- Research Assistant RC HUMIC Telkom University (Research about detecting Arrhythmia using machine learning)
- Make paper that have been accepted and presented in ICOICT 2023 entitled "Detection of Myocardial Infarction in Coronary Artery Disease Patients Based on Phonocardiogram Signal Using Ensemble Learning"

Case Study

Inventory Team

The goal :

- Make a forecast to estimated quantity of products sold so that the inventory team can maintain sufficient daily stock levels.

Marketing Team

The goal :

- Create customer segmentation clusters that serve to determine the appropriate sales treatment and promotions based on their respective clusters.

EDA

case_study_customer 1 X

```
select "Marital Status", avg(age) as rata_rata_umur from ca
```

Grid	ROC Marital Status	123 rata_rata_umur
1	Married	43.0382352941
2	Single	29.3846153846

Grid	ROC jenis_kelamin	123 rata_rata_umur
	1 Wanita	40.326446281
	2 Pria	39.1414634146

combined_table_transaction_product 1 X

```
select "Product Name", sum(totalamount) as total_amount
```

Grid	ROC Product Name	123 total_amount
1	Cheese Stick	27,613,000
2	Choco Bar	21,190,400
3	Coffee Candy	19,711,800
4	Yoghurt	19,630,000
5	Oat	15,440,000
6	Crackers	13,680,000
7	Potato Chip	13,104,000
8	Thai Tea	11,982,600
9	Cashew	11,286,000
10	Ginger Candy	8,403,200

combined_table_transaction_product 1 X

```
select "Product Name", sum(qty) as total_qty from combi
```

Grid	ROC Product Name	123 total_qty
1	Thai Tea	2,853
2	Ginger Candy	2,626
3	Choco Bar	2,408
4	Coffee Candy	2,097
5	Yoghurt	1,963
6	Cheese Stick	1,841
7	Crackers	1,824
8	Potato Chip	1,092
9	Oat	965
10	Cashew	627

combined_table_store_transaction 1 X

```
select storename, sum(qty) as total from combine
```

Grid	ROC storename	123 total
1	Lingga	2,777
2	Sinar Harapan	2,588
3	Prestasi Utama	1,395
4	Prima Kota	1,358
5	Buana	1,320
6	Prima Tendean	1,310
7	Prima Kelapa Dua	1,296
8	Harapan Baru	1,286
9	Bonafid	1,283
10	Priangan	1,239
11	Gita Ginara	1,236
12	Buana Indah	1,208

combined_table_store_transaction 1 X

```
select storename, sum(totalamount) as total_amount fro
```

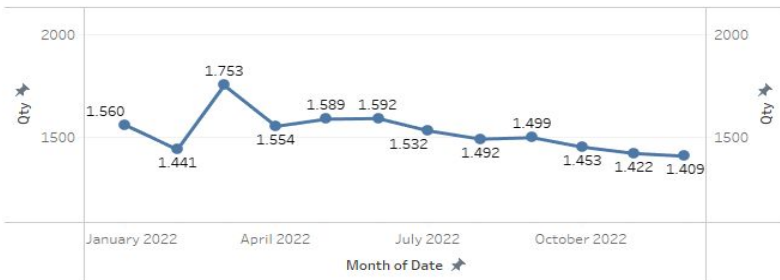
Grid	ROC storename	123 total_amount
1	Lingga	25,294,100
2	Sinar Harapan	21,882,600
3	Prestasi Utama	12,285,200
4	Prima Kelapa Dua	12,136,300
5	Prima Tendean	11,895,500
6	Bonafid	11,595,600
7	Prima Kota	11,551,100
8	Buana	11,332,000
9	Harapan Baru	11,329,500
10	Gita Ginara	11,116,100
11	Priangan	10,993,100
12	Buana Indah	10,629,900

EDA

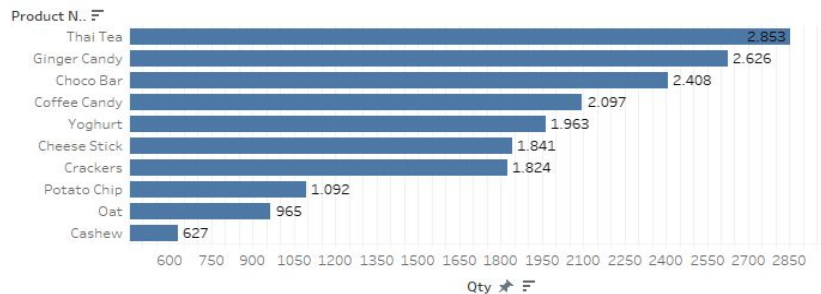
Total Sales

162.043.000

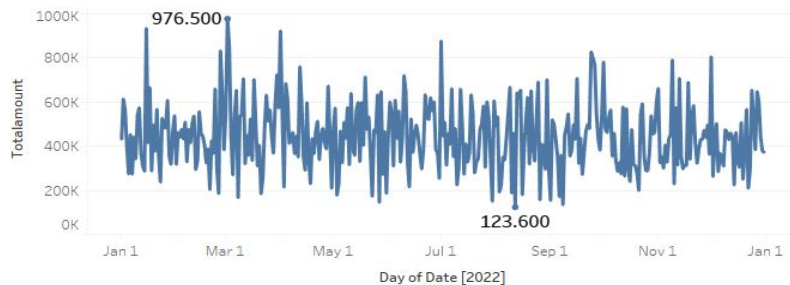
Total Quantity Sold Each Month



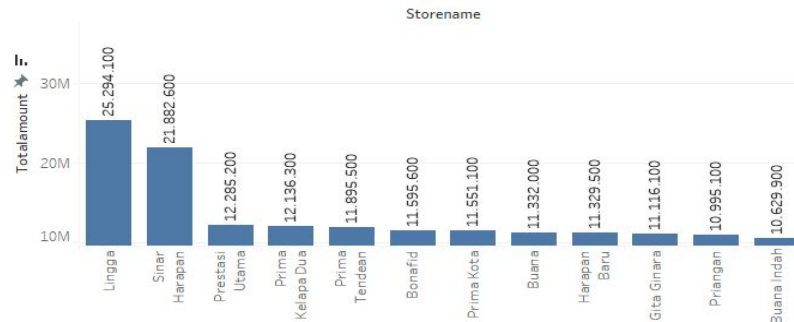
Total Product Sold by Quantity



Total Sales Each Day on 2022

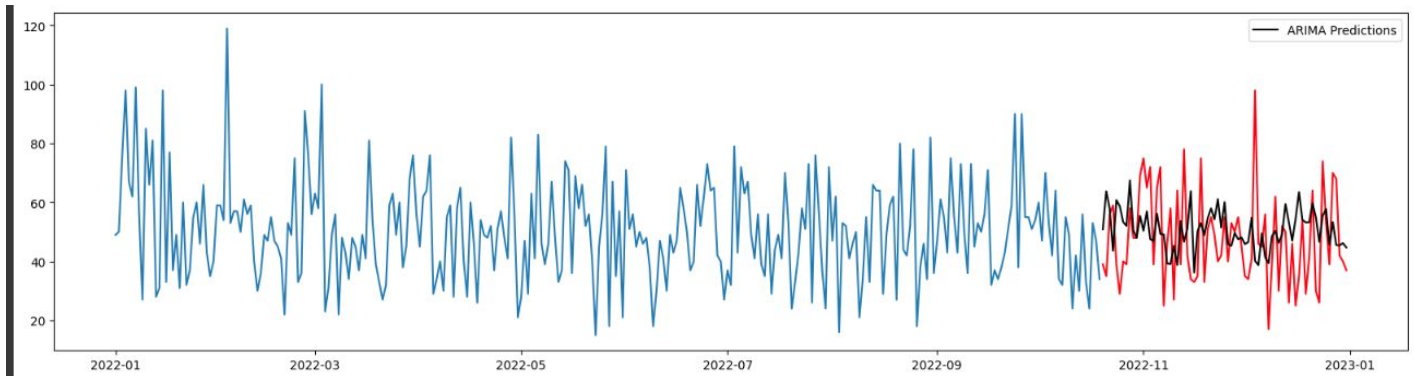
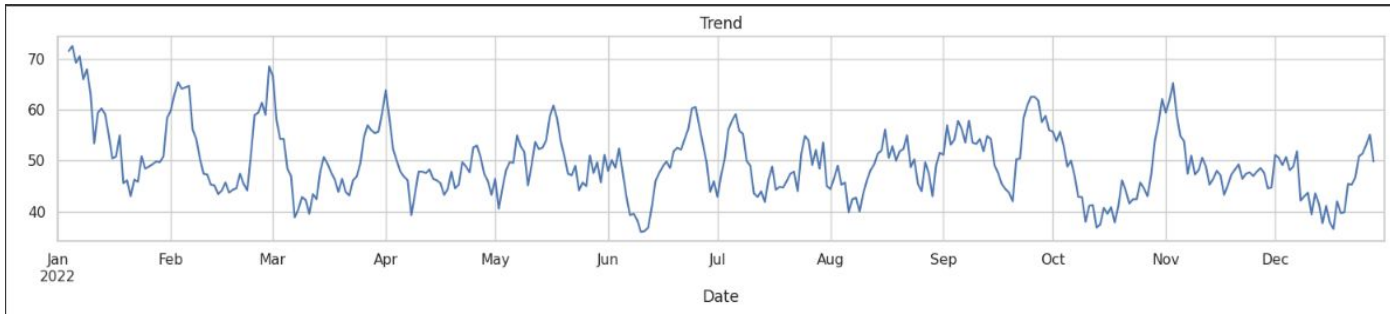


Total Sales of Each Store



Regresi

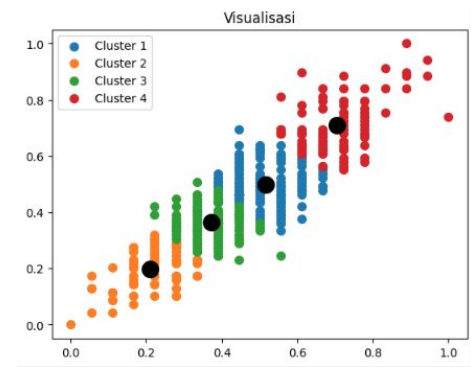
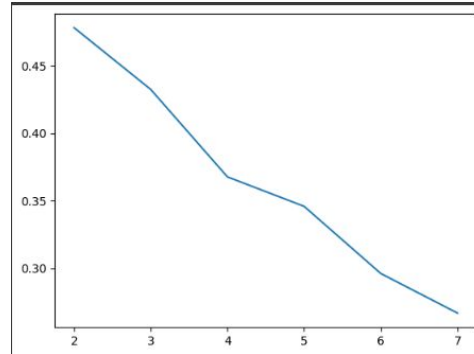
Using ARIMA Model to Forecasting product quantity



Clustering

Using KMeans to build Cluster

	TransactionID	Qty	TotalAmount
cluster_label			
0	120	5586	49363700
1	90	2189	18611300
2	157	5729	49981100
3	77	4621	42612600



Business Recommendation

Cluster 0:

- This cluster represents customers who have made a significant number of transactions (120) and have a high total quantity (5586) and total transaction amount (49363700).
- These customers tend to purchase a large quantity of products at relatively lower prices.
- Recommendation: Given their high transaction frequency and volume, it's important to maintain engagement with these customers. Consider offering loyalty programs or discounts to incentivize repeat purchases and encourage them to continue buying in bulk.

Cluster 1:

- This cluster includes customers with a moderate number of transactions (90) and a lower total quantity (2189) and total transaction amount (18611300).
- Customers in this group make smaller purchases compared to Cluster 0.
- Recommendation: Explore ways to increase the average transaction value for these customers. Cross-selling and upselling strategies may be effective in encouraging them to spend more per transaction. Consider targeted marketing campaigns to promote higher-priced products to this segment.

Business Recommendation

Cluster 2:

- Customers in this cluster have made a large number of transactions (157) and have a high total quantity (5729) and total transaction amount (49981100).
- Similar to Cluster 0, these customers purchase products in significant quantities but at relatively lower prices.
- Recommendation: Maintain a strong relationship with this customer segment by offering personalized product recommendations and promotions. Additionally, consider introducing bulk purchase discounts to further incentivize their purchasing behavior.

Cluster 3:

- This cluster represents customers with a relatively low number of transactions (77) but a high total quantity (4621) and total transaction amount (42612600).
- Customers in this cluster make fewer transactions but purchase products in substantial quantities.
- Recommendation: Recognize the potential for these customers to be resellers or wholesalers. Consider offering special pricing or bulk purchase discounts to encourage them to make larger and more frequent orders. Additionally, explore opportunities for partnerships or distribution agreements with these customers.

Github : <https://github.com/gilangrizky67>

Video Presentation :

<https://drive.google.com/drive/folders/1rjgBcR2ot03l4KlnafQCtRKzehZMXXIm?usp=sharing>

Tableau Public : <https://public.tableau.com/app/profile/gilang.muhamad.rizky>

Thank You



Rakamin
Academy



KALBE
Nutritional