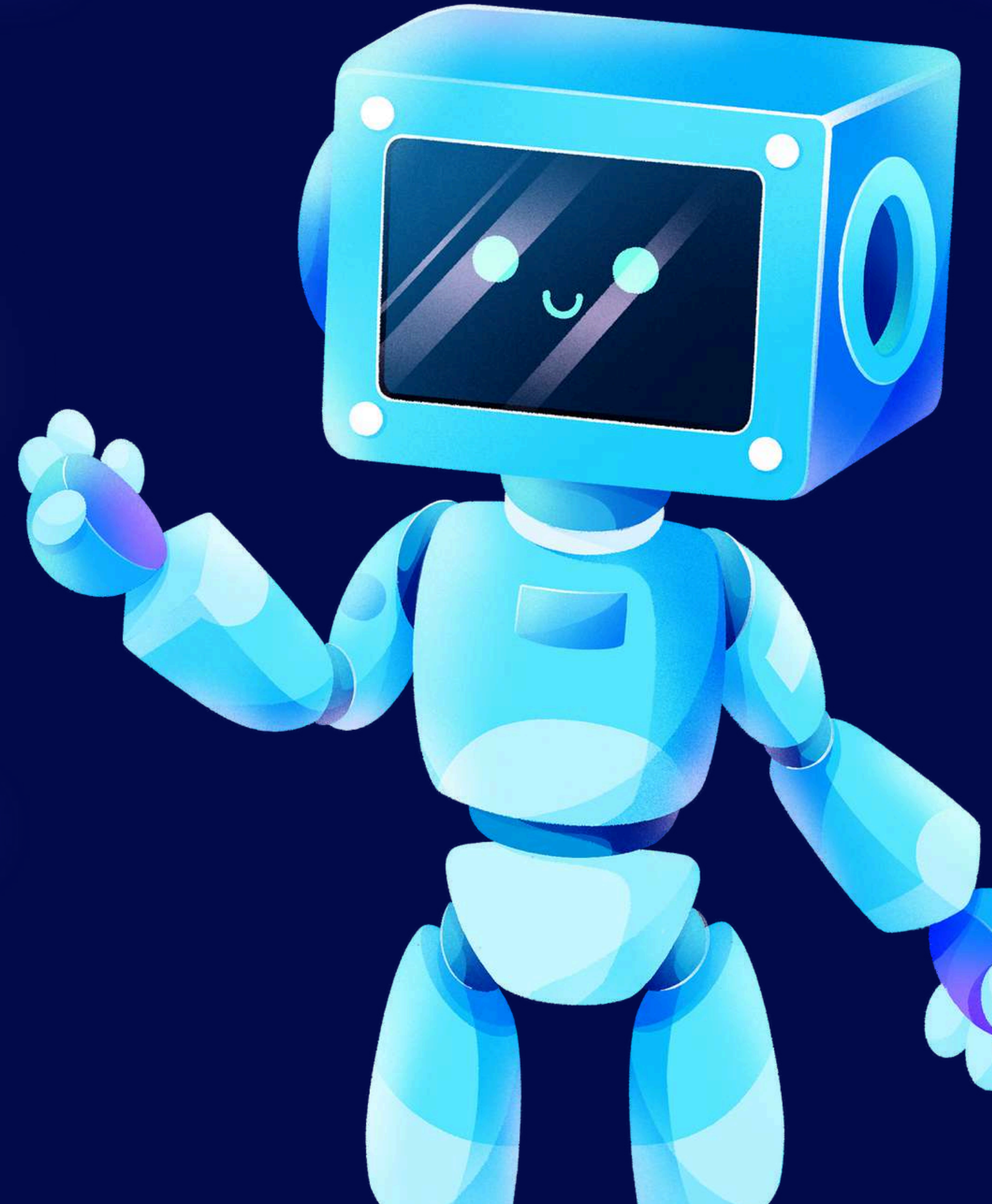


SKY_HAWKS SYSTEM

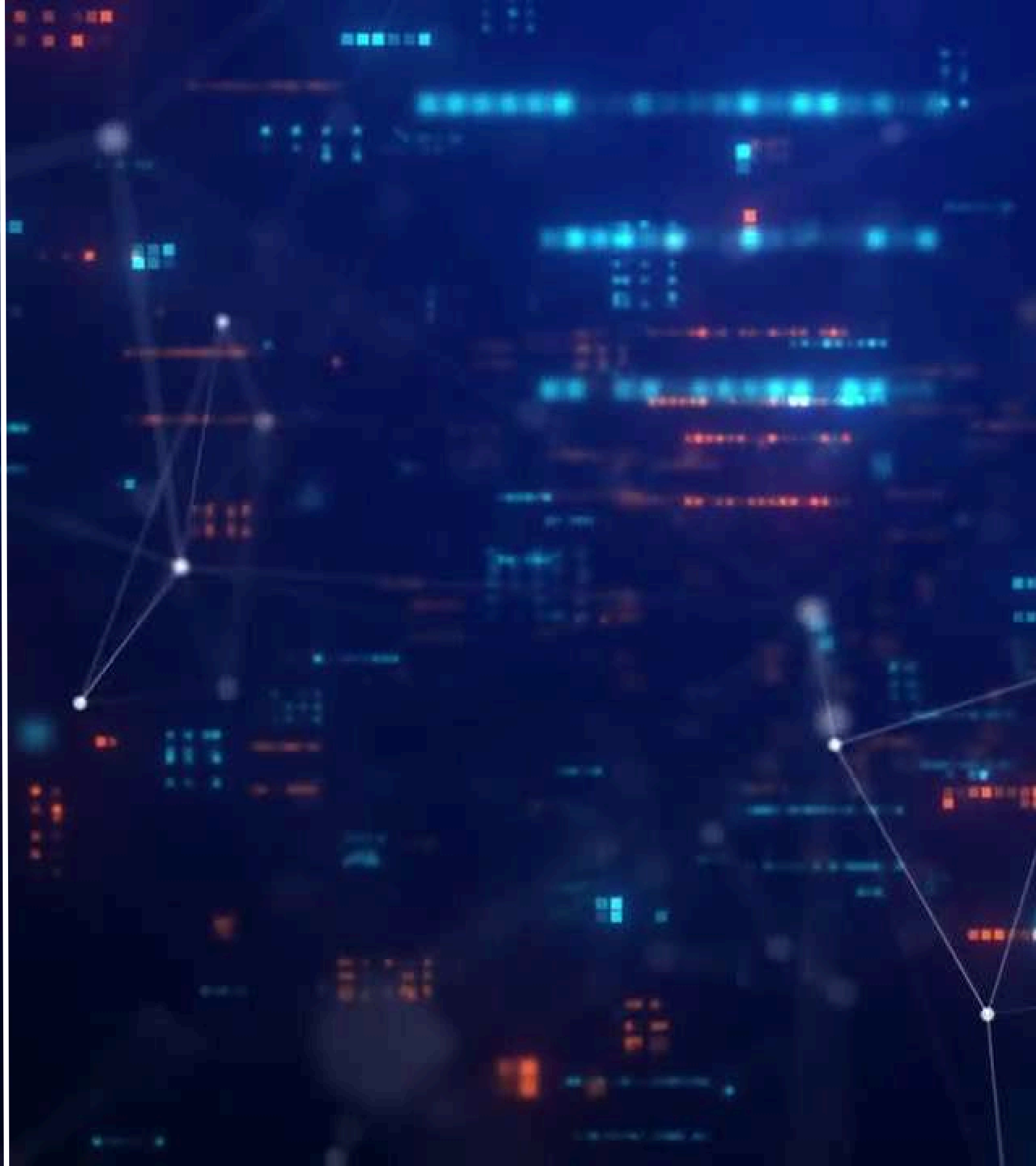
MARKET BASKET ANALYSIS USING PYTHON

PROJECT CREATED BY: D.AJAY KUMAR(192211089)
J.JOEL ANDREW(192211111)
S. DHANA PRAKASH(192211128)



INTRODUCTION

Market Basket Analysis is a powerful data mining technique used to uncover patterns and associations within transactional data. In retail, it helps in understanding the purchase behavior of customers by identifying products that are frequently bought together. Utilizing Python, this analysis becomes more accessible and efficient through libraries such as pandas, NumPy, and mlxtend. Python's robust ecosystem allows for the seamless handling of large datasets, the application of association rule algorithms like Apriori, and the visualization of results. This enables businesses to optimize product placement, improve marketing strategies, and ultimately enhance customer satisfaction and sales performance.



OBJECTIVE

THE ART OF EXPLORATION




The objective of Market Basket Analysis using Python is to identify and analyze patterns of co-occurrence in transactional data to uncover associations between products. By applying data mining techniques and leveraging Python's powerful libraries, the goal is to generate actionable insights that can help businesses optimize inventory management, enhance marketing strategies, and improve customer experience.



EXISTING SYSTEM

In the existing system, Market Basket Analysis is often performed using traditional data mining tools and manual analysis techniques. These methods can be time-consuming, prone to errors, and limited in handling large volumes of transactional data. Typically, businesses rely on basic statistical methods or specialized software that may not fully integrate with modern data processing workflows. This system lacks the flexibility and scalability needed to quickly adapt to changing market trends

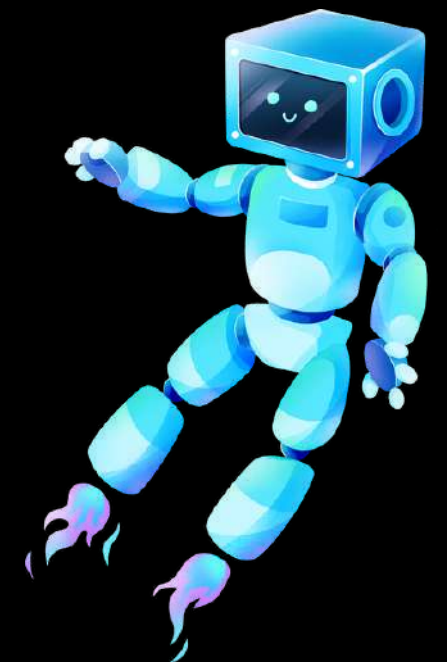
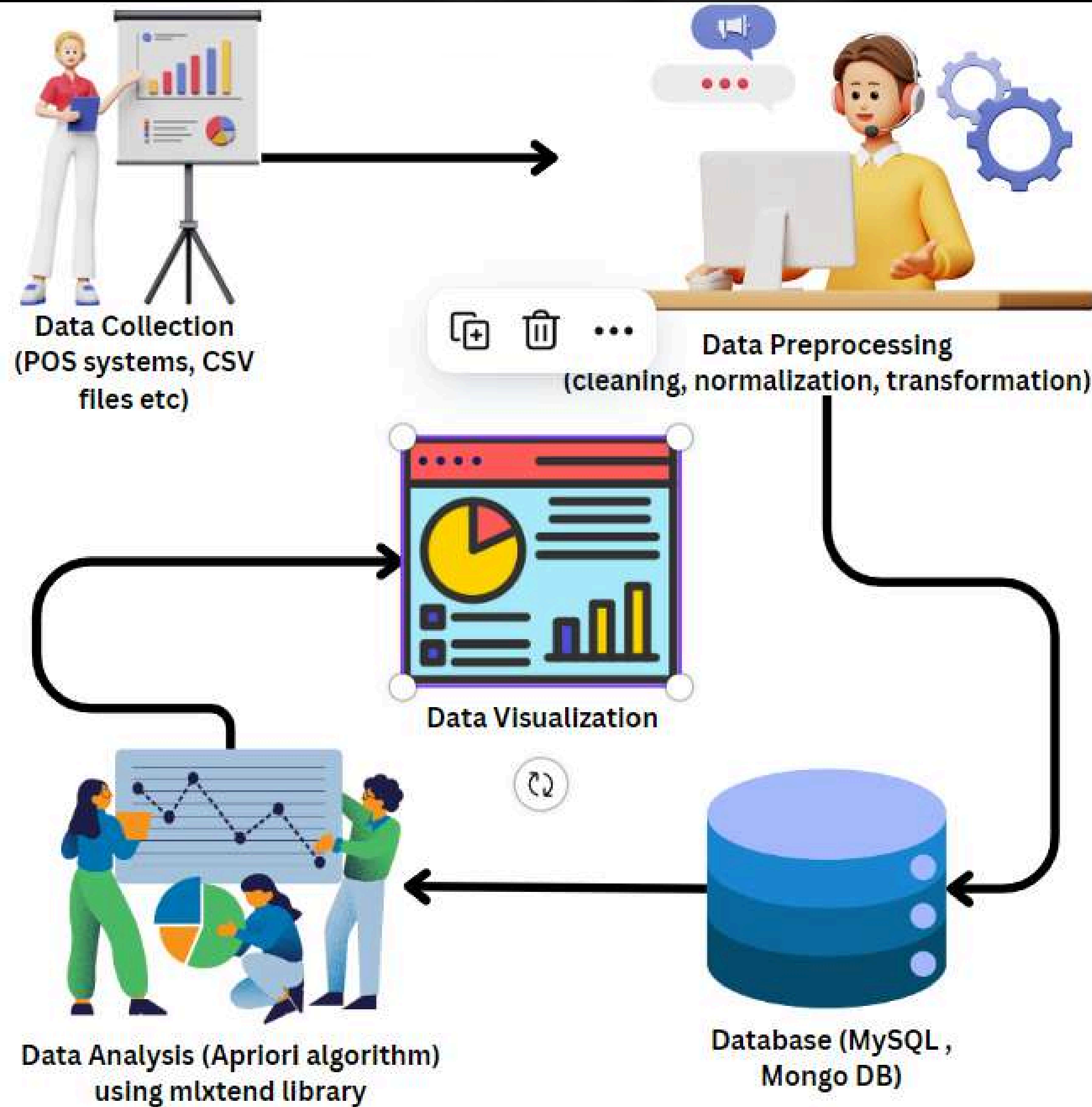


A person's hand is shown in the foreground, reaching out towards a futuristic, glowing blue robotic hand. The robotic hand has a complex, segmented design with glowing blue lights at the joints and fingers. The background is dark and out of focus, showing the person's face and upper body. The overall color scheme is dominated by blue and purple hues, creating a high-tech, futuristic atmosphere.

PROPOSED SYSTEM

The proposed system utilizes Python's advanced data analytics libraries to enhance Market Basket Analysis. By leveraging tools like pandas, NumPy, and mxxtend, the system can efficiently process large datasets and uncover valuable associations between products. The integration of machine learning algorithms, such as Apriori, automates the discovery of frequent itemsets and actionable insights. This scalable and flexible solution enables businesses to quickly adapt to market trends, optimize product placement, and improve marketing strategies.

ARCHITECTURE DESIGN



[illegible]

MODULE 01

Results

Analysis...

	Consequents	Support	Confidence

Min Support: 0.01

Min Confidence: 0.5

Min Lift: 1.0

Filter

Plot Graph

Save Rules to CSV

Save Rules to Excel

Save Rules to JSON

Show Rule Details

Plot Histograms

In this Market Basket Analysis project, the GUI output is generated using Python's Tkinter library, providing a user-friendly interface to interact with the analysis results. The main window displays the association rules derived from the dataset, showing columns for antecedents, consequents, support, confidence, and lift. Users can filter these rules by specifying minimum values for support, confidence, and lift in the provided input fields.

MODULE 01

Results

Analysis...

	Consequents	Support	Confidence

Min Support: 0.01

Min Confidence: 0.5

Min Lift: 1.0

Filter

Plot Graph

Save Rules to CSV

Save Rules to Excel

Save Rules to JSON

Show Rule Details

Plot Histograms

In this Market Basket Analysis project, the GUI output is generated using Python's Tkinter library, providing a user-friendly interface to interact with the analysis results. The main window displays the association rules derived from the dataset, showing columns for antecedents, consequents, support, confidence, and lift. Users can filter these rules by specifying minimum values for support, confidence, and lift in the provided input fields.

MODULE 02

Market Basket Analysis Results				
Data loaded successfully!				
Antecedents	Consequents	Support	Confidence	
{'60 TEATIME FAIRY CAKE CASES'}	{'PACK OF 72 RETROSPOT CAKE CASES'}	0.01873517139818375	0.547846889952153	10.03947906429
{'ALARM CLOCK BAKELIKE CHOCOLATE'}	{'ALARM CLOCK BAKELIKE GREEN'}	0.011372003599770924	0.6303854875283447	15.39500861949
{'ALARM CLOCK BAKELIKE CHOCOLATE'}	{'ALARM CLOCK BAKELIKE RED '}	0.012108320379612207	0.671201814058957	15.17872298472
{'ALARM CLOCK BAKELIKE IVORY'}	{'ALARM CLOCK BAKELIKE GREEN'}	0.013744579890370612	0.5763293310463121	14.07487195480
{'ALARM CLOCK BAKELIKE ORANGE'}	{'ALARM CLOCK BAKELIKE GREEN'}	0.011331097112001963	0.5995670995670995	14.64237494107
{'ALARM CLOCK BAKELIKE PINK'}	{'ALARM CLOCK BAKELIKE GREEN'}	0.017139818375194307	0.5244055068836045	12.80681021106
{'ALARM CLOCK BAKELIKE RED '}	{'ALARM CLOCK BAKELIKE GREEN'}	0.02642559109874826	0.5975948196114708	14.59420875147
{'ALARM CLOCK BAKELIKE GREEN'}	{'ALARM CLOCK BAKELIKE RED '}	0.02642559109874826	0.6453546453546454	14.59420875147
{'ALARM CLOCK BAKELIKE IVORY'}	{'ALARM CLOCK BAKELIKE RED '}	0.015421745888897978	0.6466552315608919	14.62362052797
{'ALARM CLOCK BAKELIKE ORANGE'}	{'ALARM CLOCK BAKELIKE RED '}	0.01268101120837765	0.670995670995671	15.17406121476
{'ALARM CLOCK BAKELIKE PINK'}	{'ALARM CLOCK BAKELIKE RED '}	0.019512394665793995	0.5969962453066333	13.50061999330
{'PAINTED METAL PEARS ASSORTED'}	{'ASSORTED COLOUR BIRD ORNAMENT'}	0.010635686819929642	0.6989247311827957	11.64683979447
{'BAKING SET SPACEBOY DESIGN'}	{'BAKING SET 9 PIECE RETROSPOT '}	0.013703673402601653	0.6979166666666667	17.75366371834
{'TOILET METAL SIGN'}	{'BATHROOM METAL SIGN'}	0.012026507404074287	0.7170731707317073	27.56221813161
{'BLUE HAPPY BIRTHDAY BUNTING'}	{'PINK HAPPY BIRTHDAY BUNTING'}	0.010799312771005482	0.6717557251908397	40.44763659609
{'PINK HAPPY BIRTHDAY BUNTING'}	{'BLUE HAPPY BIRTHDAY BUNTING'}	0.010799312771005482	0.6502463054187193	40.44763659609
{'BLUE HARMONICA IN BOX '}	{'RED HARMONICA IN BOX '}	0.01292645013499141	0.5223140495867769	19.05744665104
{'RED STRIPE CERAMIC DRAWER KNOB'}	{'BLUE STRIPE CERAMIC DRAWER KNOB'}	0.01039024789331588	0.5682326621923938	31.93336933323
{'BLUE STRIPE CERAMIC DRAWER KNOB'}	{'RED STRIPE CERAMIC DRAWER KNOB'}	0.01039024789331588	0.5839080459770115	31.93336933323
{'CANDLEHOLDER PINK HANGING HEART'}	{'WHITE HANGING HEART T-LIGHT HOLDER'}	0.011617442526384684	0.7047146401985112	7.483689875887
{'CHARLOTTE BAG APPLES DESIGN'}	{'CHARLOTTE BAG SUKI DESIGN'}	0.012435572281763887	0.5143824027072758	14.06553939214
{'CHARLOTTE BAG APPLES DESIGN'}	{'RED RETROSPOT CHARLOTTE BAG'}	0.013540047451525813	0.5600676818950932	13.03944243010
{'CHARLOTTE BAG PINK POLKADOT'}	{'CHARLOTTE BAG SUKI DESIGN'}	0.016976192424118464	0.5460526315789473	14.93154656776
{'CHARLOTTE BAG PINK POLKADOT'}	{'RED RETROSPOT CHARLOTTE BAG'}	0.021516812566473042	0.6921052631578948	16.11352882205
{'RED RETROSPOT CHARLOTTE BAG'}	{'CHARLOTTE BAG PINK POLKADOT'}	0.021516812566473042	0.5009523809523809	16.11352882205
{'STRAWBERRY CHARLOTTE BAG'}	{'CHARLOTTE BAG PINK POLKADOT'}	0.01562627832774278	0.5204359673024523	16.74023375878
{'CHARLOTTE BAG PINK POLKADOT'}	{'STRAWBERRY CHARLOTTE BAG'}	0.01562627832774278	0.5026315789473684	16.74023375878
{'CHARLOTTE BAG PINK POLKADOT'}	{'WOODLAND CHARLOTTE BAG'}	0.01623987564427718	0.5223684210526316	15.14806455640
Min Support: 0.01 Min Confidence: 0.5 Min Lift: 1.0 Filter & Display Rules				
Plot Graph				
Save Rules to CSV				
Save Rules to Excel				
Save Rules to JSON				
Show Rule Details				
Plot Histograms				

In this Market Basket Analysis project, the GUI output generated using Python's Tkinter library provides an interactive and user-friendly interface for loading and analyzing transaction data. Upon successfully loading the dataset, the GUI displays the dataset in a structured format, showcasing various transaction details such as Invoice, StockCode, Description, Quantity, InvoiceDate, Price, Customer ID, and Country.

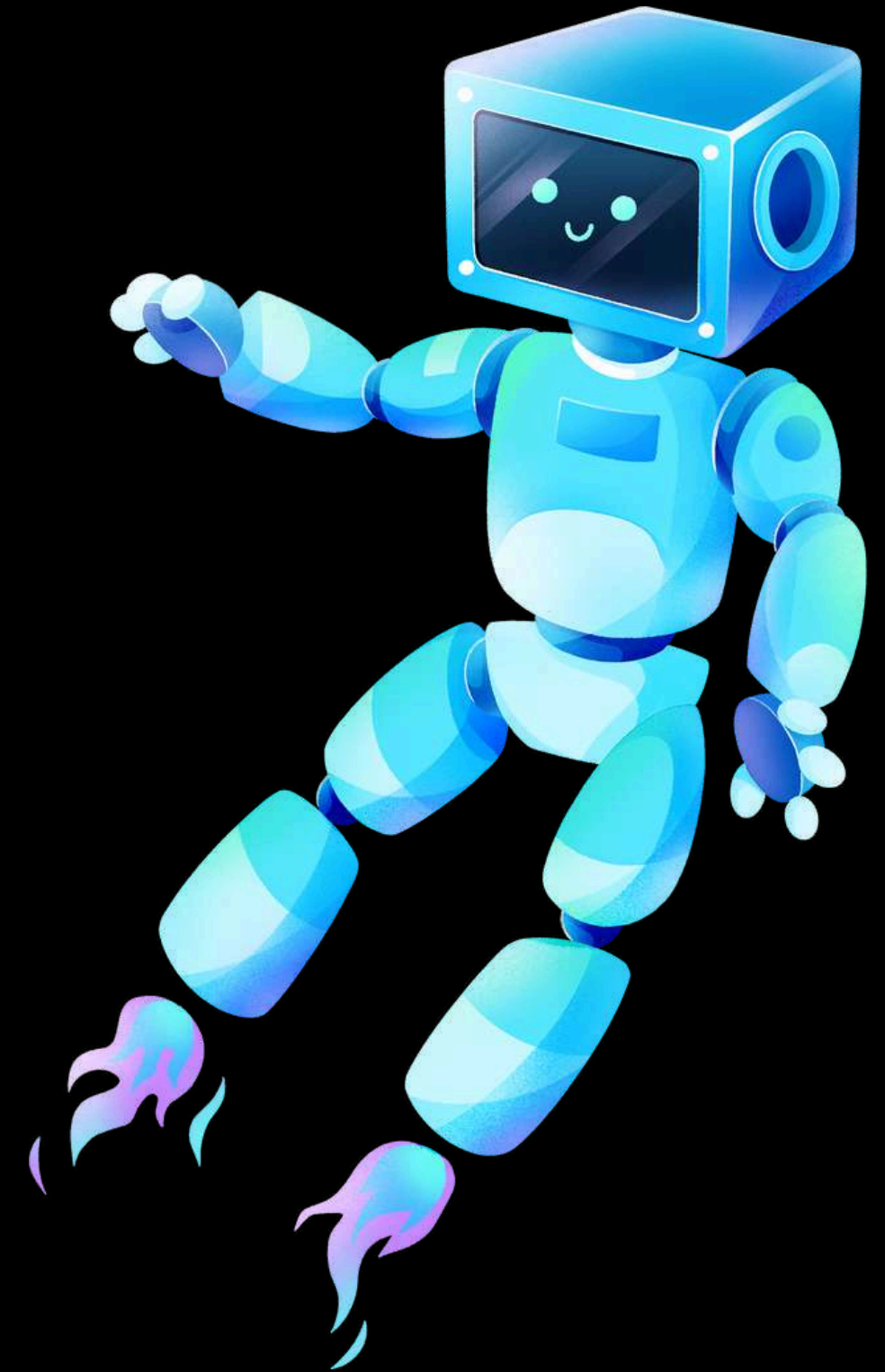
MODULE 03



In this Market Basket Analysis project, the Support vs. Confidence graph is a crucial visualization that helps in understanding the strength and reliability of the association rules generated from the transaction data. The graph plots support values on the x-axis and confidence values on the y-axis for each rule. Each point represents an association rule, with its position indicating how frequently the rule appears in the dataset (support) and the reliability of the rule (confidence).

CONCLUSION

In conclusion, this Market Basket Analysis project effectively demonstrates the power of association rule mining in uncovering meaningful patterns within transaction data. By utilizing Python's robust data analysis libraries and providing a user-friendly GUI, the project allows users to easily load datasets, generate insightful association rules, and visualize these rules through graphs and tables. The interactive interface and advanced filtering capabilities enable a deeper understanding of customer purchasing behavior, aiding businesses in making data-driven decisions to optimize product placement, marketing strategies, and inventory management.



REFERENCES

- [1] Halim, Octavia, and Alianto. 2019. Designing Facility Layout of an Amusement Arcade using Market Basket Analysis. Procedia Computer Science, Vol 161, Page 623–629. ([1] Hasan, KM Azharul, Amit Mondal, and Amit Saha. "A context free grammar and its predictive parser for bangla grammar recognition." In 2010 13th International Conference on Computer and Information Technology (ICCIT), pp. 87–91. IEEE, 2010. http://dx.doi.org/10.1007/978-981-16-0586-4_26
- [2] Braune, Beatrix, Stephan Diehl, Andreas Kerren, and Reinhard Wilhelm. "Animation of the generation and computation of finite automata for learning software." In International Workshop on Implementing Automata, pp. 39–47. Berlin, Heidelberg: Springer Berlin Heidelberg, 1999. https://doi.org/10.1007/3-540-45526-4_4



THANK YOU!

TEAM

D.AJAY KUMAR

J. JOEL ANDREW

S. DHANA PRAKASH

