Inconvenient Convenience Store

Milestone: Project Report

Group 21

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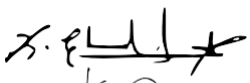
Signature of Student1: 

SignatureofStudent2: 

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USE CASE STUDY REPORT

Executive Summary:

A Convenience store is a little retail business that stocks regular things the typical individual uses. They give a financial lift to the economy, thus providing economic stability. These are the speedier determination for more modest shopping of things. Convenience stores offer speed of administration to time-starved buyers who need to rapidly get in and out of the store. There is somewhere around one convenience store for 2100 individuals in the US. This shows the market size of the convenience store industry and is expected to increase later.

Pluto Convenience Store, they are utilizing the manual recording of exchanges, at times they neglect to record the exchange of certain clients. Utilizing a manual recording, there's a high chance of mistakes and miscomputations of deals like the record being lost as a result of the hecticness of the staff. The inventory does not have a specific record, where the data of products could be stored. Transaction tracking makes it much easier and more reliable to use which is lacking in the store. Since the framework is mechanized, it tends to be simple for the owner to deal with the exercises in their business. Hence, this framework can reduce the paperwork around here and it will not be tedious for the owner and staff.

Our project provides an easily accessible way to track the transactions being done, the sales, and the inventory. It empowers clients to make, update and store items and exchanges that are occurring. This project can be used by owners, who are using manual transaction methods and are failing to maintain the supply and demand equation. This can reduce errors and save time thus increasing the store's efficiency, by increasing sales. We want to design a system that focuses on improving profits and sales and providing a better experience to both employees and customers. We want to create a database to store the information of the employees, customers, orders, inventory management, categories of the product, billing process, number of products, and suppliers.

I. Introduction:

Not everyone has the time to go to these supermarkets every day. According to the US census bureau, there is somewhere around one convenience store for 2245 individuals in the US. This shows the market size of the convenience store industry and is expected to increase later. But during 2021- 2022 there was a 1.5 percent decline. The reasons include the perceived weakness of c-stores is their size, or lack of it - presenting the problem of how to offer customers a one-stop shopping experience.

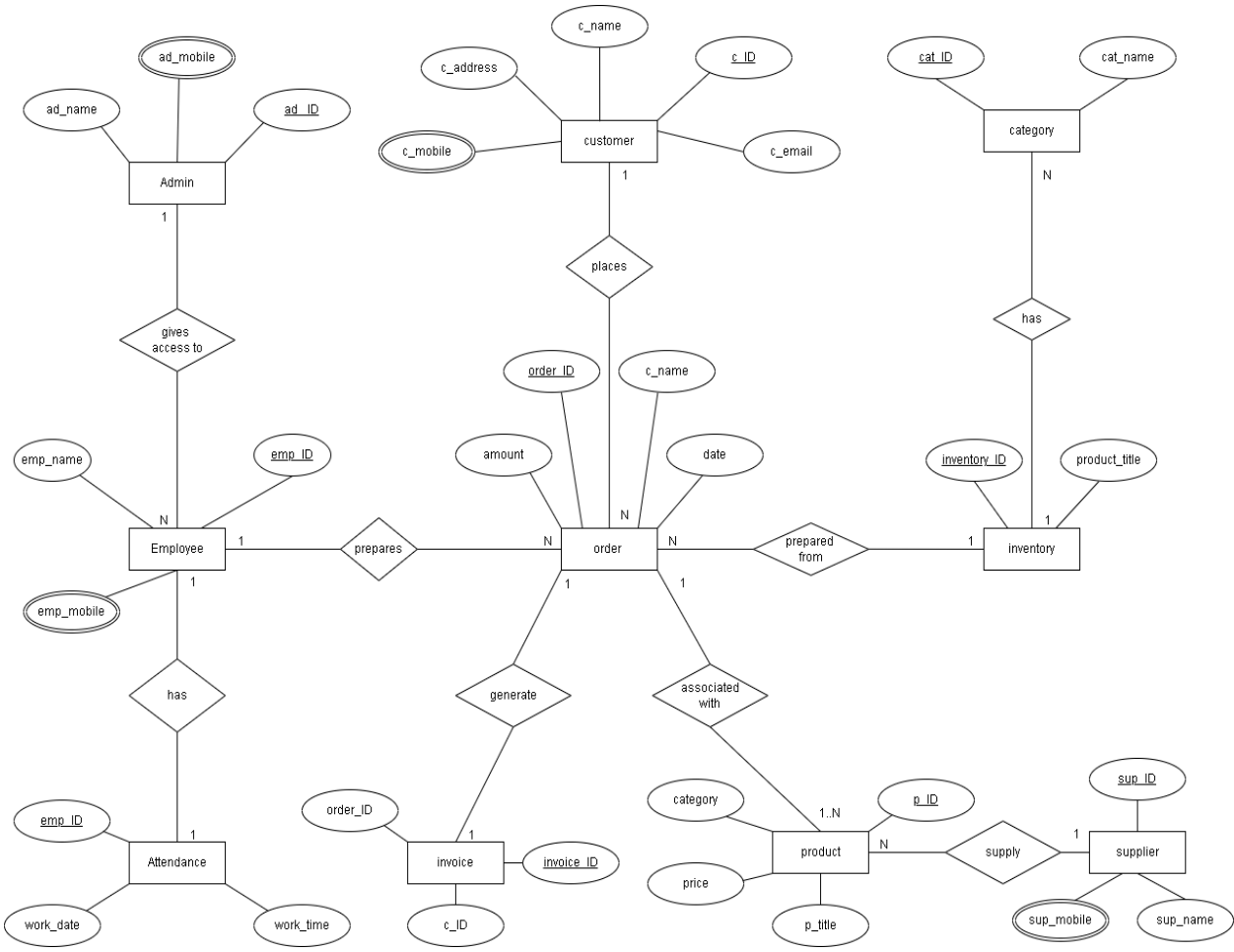
“It’s not about the size of your store. it’s how best the CUSTOMER EXPERIENCE is”. Our motto is to provide top-notch customer service by improving the database thus reducing the customer wait time during transactions.

Convenience stores give a financial lift to the economy. Due to the busyness of the personnel, manually recording transactions increases the risk of errors and miscalculations of deals, such as the record is lost. There isn't a specific record in the inventory where the information about the products could be kept. The store lacks transaction tracking, which makes it considerably simpler and more dependable to use. Given that the system is automated, managing the operations of the business is typically simple for the owner.

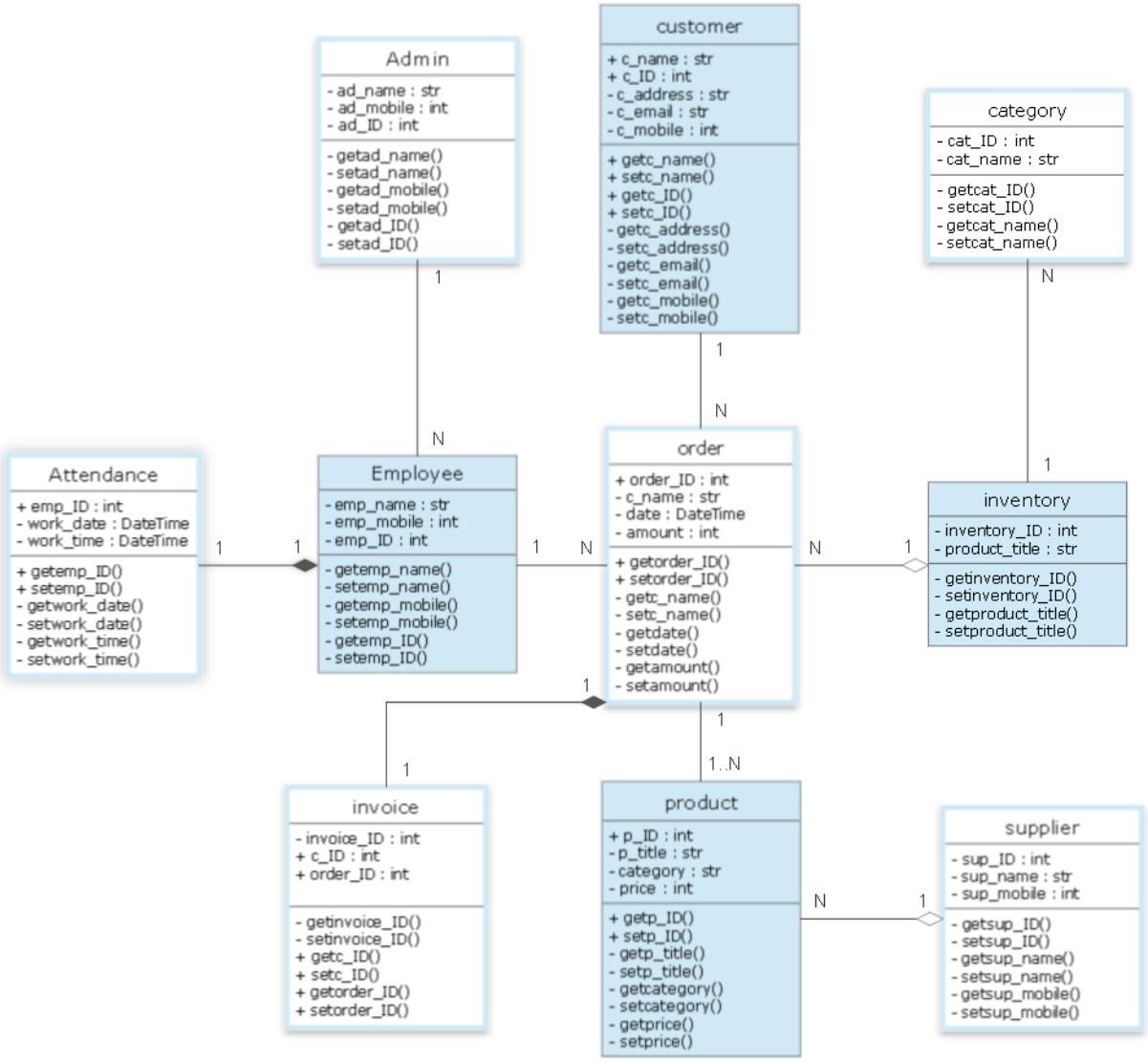
The database holds details and quantities of the products that are stocked, together with information on product suppliers. From this project, we can replace manual methods of inventory control and reduce the time, cost, and effort of inventory management. Data on customers, orders, and products have been generated. Keeping up with technical trends, expanding the business thus increasing the sales with an alternative lender.

II. Conceptual Data Modeling

1. EER Diagram:



2. UML Diagram:



III. Mapping Conceptual Model to Relational Model:

Primary Key- Underlined **Foreign Key- *Italicized***

Admin (ad_ID, ad_name)

Primary Key: ad_ID

Admin_mobile(*ad_ID*,ad_mobile)

Primary Key: ad_ID,ad_mobile

Foreign Key: ad_ID

Admin_mobile is a multivalued attribute therefore a new relation is built and made a composite primary key

Employee(emp_ID, emp_name, *ad_ID*)

Primary Key: emp_ID

Foreign Key: ad_ID

Employee_mobile(*emp_ID*, emp_mobile)

Primary Key: emp_ID, emp_mobile

Foreign Key: emp_ID

Employee_mobile is a multivalued attribute therefore a new relation is built and made a composite primary key.

Attendance(work_date,work_time, *emp_ID*)

Primary Key: emp_ID

Foreign Key:emp_ID

Customer(c_ID, C_name,c_address, c_email)

Primary Key: c_ID

Foreign Key: c_ID

Customer_mobile(*c_ID*, c_mobile)

Primary Key: c_ID, c_mobile

Foreign Key: c_ID

Order(order_ID, amount, date, c_name, *c_ID*, *emp_ID*, *Inventory_ID*)

Primary Key: order_ID

Foreign Key:c_name, c_ID, emp_ID, Inventory_ID

Inventory(Inventory_ID, product_title)

Primary Key: Inventory_ID

Category(cat_ID, cat_name,*Inventory_ID*)

Primary Key: cat_ID

Foreign Key: Inventory_ID

Invoice(c_ID,invoice_ID,*order_ID*)

Primary Key: invoice_ID

Foreign Key: order_ID

Product(category,price, p_ID,p_title,*order_ID*, *sup_ID*)

Primary Key: p_ID

Foreign Key: order_ID,sup_ID

Supplier(sup_ID,sup_name)

Primary Key: sup_ID

Supplier_mobile(*sup_ID*,sup_mobile)

Primary Key: sup_ID, sup_mobile

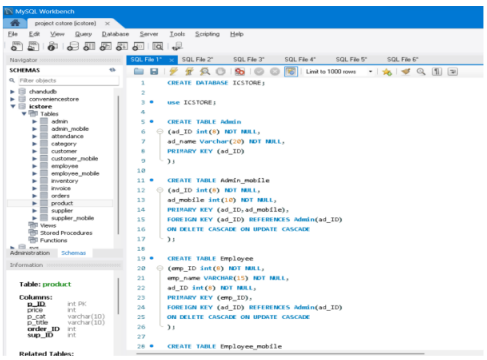
Foreign Key: sup_ID

Supplier_mobile is a multivalued attribute therefore a new relation is built and made a composite primary key.

IV. Implementation of Relational Model via MySQL and NoSQL:

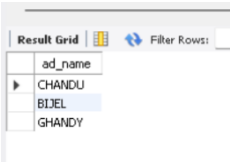
MySQL Implementation- The database was created in My SQL and the following queries were performed:

1) **Overview of the whole database in MYSQL**



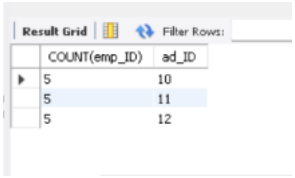
Q.1) Who are the admins for the store?

SELECT DISTINCT ad_name **FROM** admin;



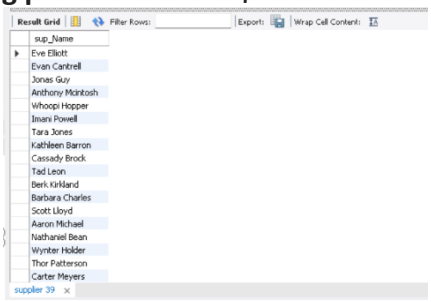
Q.2) What is the employee count under each Admin?

SELECT COUNT(emp_ID), ad_ID
FROM employee
GROUP BY ad_ID
ORDER BY COUNT(ad_ID) DESC;



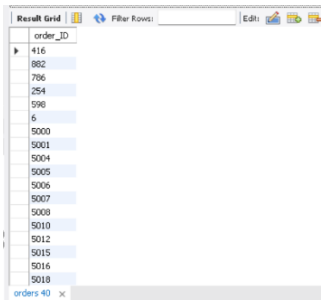
Q.3) Name the suppliers who have been supplying products above $80.

SELECT sup_Name
FROM supplier
WHERE EXISTS (
SELECT p_title
FROM product
WHERE product.sup_ID = supplier.sup_ID
AND price < 80);



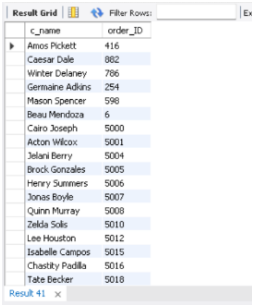
Q.4) What are the orders that are prepared from inventory "666"?

SELECT order_ID
FROM orders
WHERE order_ID **IN**
(**SELECT** order_ID
FROM inventory
WHERE inventory_ID = '666');



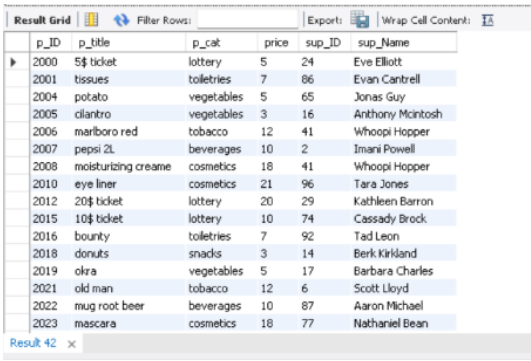
Q.5) Who are all the active customers so far in the store?

SELECT customer.c_name, orders.order_ID
FROM orders
Inner JOIN customer **ON** orders.c_ID = customer.c_ID;



Q.6) What is the ID and title of the product that can be supplied by more than one supplier?

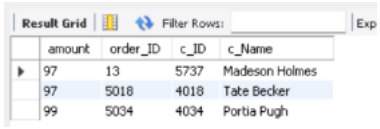
```
SELECT p.p_ID,p.p_title,p_cat, price, s.sup_ID,s.sup_Name
FROM product p, supplier S
WHERE  p.sup_ID = s.sup_ID and
1 <= (select count(*) from supplier s1
    where s1.sup_ID <> s.sup_ID)
    order by p_ID;
```



p_ID	p_title	p_cat	price	sup_ID	sup_Name
2000	5$ ticket	lottery	5	24	Eve Elliott
2001	tissues	toiletries	7	86	Evan Cantrell
2004	potato	vegetables	5	65	Jonas Guy
2005	cilantro	vegetables	3	16	Anthony Mcintosh
2006	marlboro red	tobacco	12	41	Whoopi Hopper
2007	pepsi 2L	beverages	10	2	Imani Powell
2008	moisturizing creame	cosmetics	18	41	Whoopi Hopper
2010	eye liner	cosmetics	21	96	Tara Jones
2012	20$ ticket	lottery	20	29	Kathleen Barron
2015	10$ ticket	lottery	10	74	Cassady Brock
2016	bounty	toiletries	7	92	Tad Leon
2018	donuts	snacks	3	14	Berk Kirkland
2019	okra	vegetables	5	17	Barbara Charles
2021	old man	tobacco	12	6	Scott Lloyd
2022	mug root beer	beverages	10	87	Aaron Michael
2023	mascara	cosmetics	18	77	Nathaniel Bean

Q.7) top 3 customers who made the highest payments using an inner join

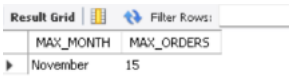
```
SELECT o.amount, o.order_ID, c.c_ID, c.c_Name
FROM orders as o
INNER JOIN customer AS c
on o.c_ID=c.c_ID
 WHERE 3> (
 SELECT count(o1.amount)
 FROM orders o1
 WHERE o.amount<o1.amount);
```



amount	order_ID	c_ID	c_Name
97	13	5737	Madeson Holmes
97	5018	4018	Tate Becker
99	5034	4034	Portia Pugh

Q.8) Which month has got more orders??

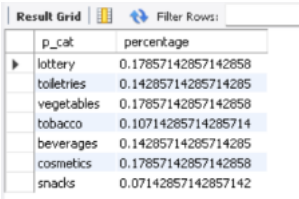
```
SELECT monthname(dateofpurchase) as MAX_MONTH , count(*) AS MAX_ORDERS
FROM orders
GROUP BY  monthname(dateOfPurchase)
ORDER BY count(*)
desc limit 1;
```



MAX_MONTH	MAX_ORDERS
November	15

Q.9) What is the percentage of each product category that is sold?

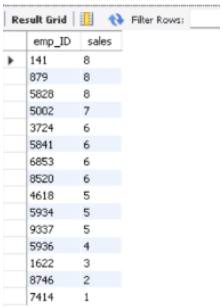
```
SELECT p_cat, COUNT(*) / cast(sum(count(*)) over () as float) as percentage
FROM product
GROUP BY p_cat;
```



p_cat	percentage
lottery	0.17857142857142858
toiletries	0.14285714285714285
vegetables	0.17857142857142858
tobacco	0.10714285714285714
beverages	0.14285714285714285
cosmetics	0.17857142857142858
snacks	0.07142857142857142

Q.10) Find out the number of sales of each employee.

```
SELECT emp_ID,
Count(*) as sales
FROM orders
GROUP BY emp_ID
ORDER BY sales desc;
```

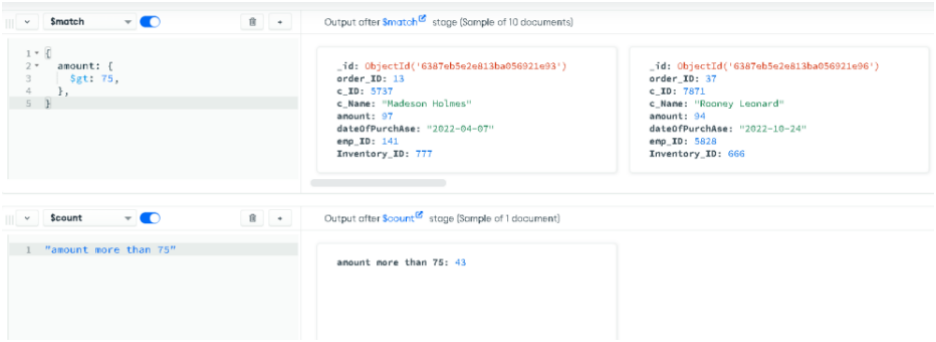


emp_ID	sales
141	8
879	8
5828	8
5002	7
3724	6
5841	6
6853	6
8520	6
4618	5
5934	5
9337	5
5936	4
1622	3
8746	2
7414	1

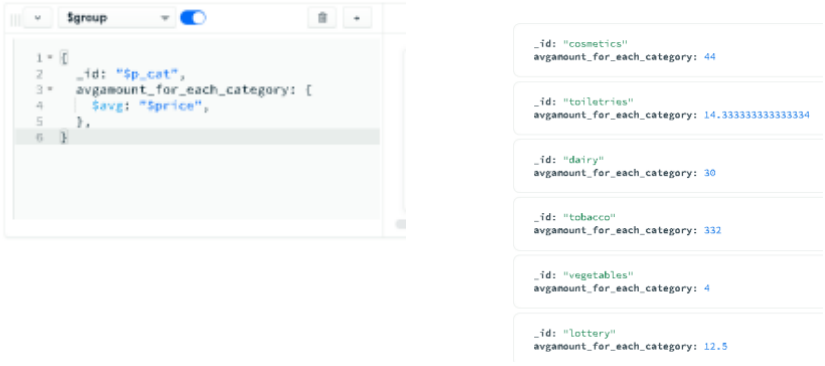
NoSQL Implementation- MongoDB has been used for the Implementation of the database in NoSQL. MongoDB uses the
MongoDB Query Language (MQL), designed for easy use by developers. The database of each class has been exported into JSON and then imported into MongoDB.

Query 1: Find the customer named “Michelle Giles”?

Query 2: Find the number of orders valued above $75.



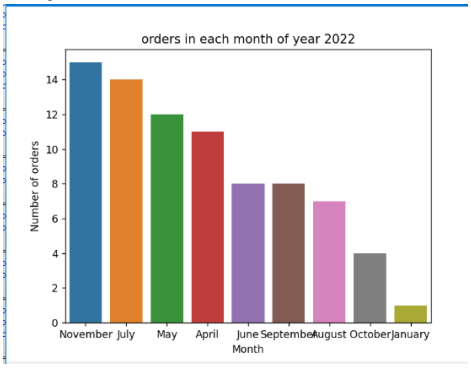
Query 3: What is the average price of products from each category?



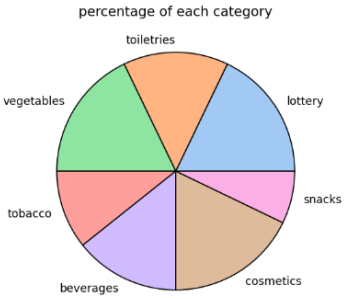
V. Database Access via Python:

The database is accessed using IDLE Python and visualization of analyzed data is shown below,

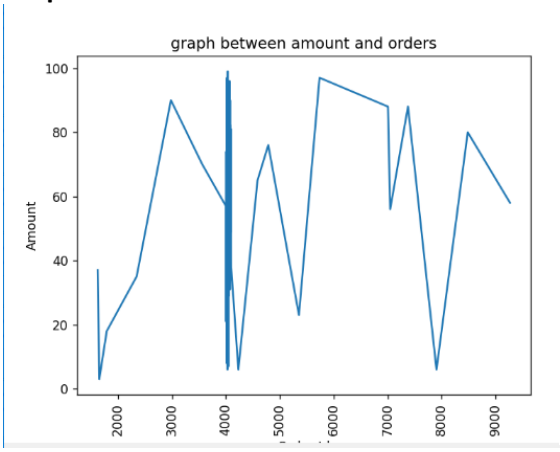
Graph 1: Orders for each month of the year



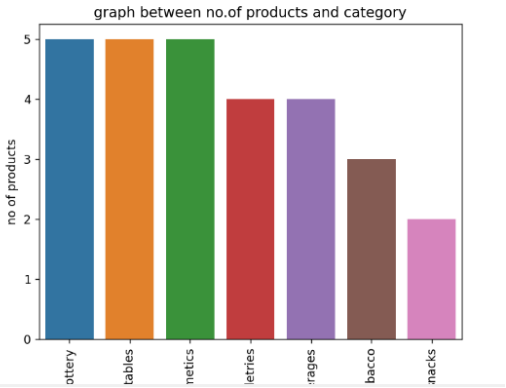
Graph 2: percentage of each month



Graph 3: amount and orders



Graph 4: No. of products and category



VI. Summary and Recommendation:

The convenience store database designed on MySQL is a ready database that can be used for suburban areas. This can also extend to multiple stores under the same manager. By identifying the trends and forecasting future demand efficiently and accurately. The supplier information in the database also makes it quicker and easier to place orders or to find alternative suppliers if one company cannot meet your delivery requirements.

With the right level of security in place, you can give customers, suppliers, and logistics partners access to certain areas of your database. Customers, for example, can check their order history and the delivery status of outstanding orders. By giving suppliers access to stock levels, you can help them to plan their own production schedules more efficiently. Logistics partners can check on current orders so they can plan their delivery schedules.