NIRMA UNIVERSITY
INSTITUTE OF TECHNOLOGY
NAAC ACCREDITED 'A' GRADE

NIRMA UNIVERSITY
NAAC ACCREDITED 'A+' GRADE

(2CS505)-DBMS INNOVATIVE ASSIGNMENT

STORE MANAGEMENT SYSTEM

Submitted To: Prof. Monika Shah

Submitted By:

Anmol Panjwani (22BCE018)

Ayush Patel (22BCE027)

INTRODUCTION

- In this project we have implemented Store Management System using MySQL and Python using connectors and have provided with a Graphical User Interface for the same.
- The project's goal is to provide a user-friendly, scalable, and secure system that can manage a store's inventory, sales, purchases, and customer data.
- The project's main objectives include designing a database schema, developing the application logic, and creating a user interface that is easy to use and navigate.
- This system has rich user interface so that normal user can access easily.

What is Store Management System?

- The store management system is an essential tool for store owners to manage their store's inventory, sales, purchases, and customer data effectively.
- By automating various processes, the system can help store owners save time, reduce costs, and improve their business's overall efficiency.

Technologies Used

- MySQL
- Python
- Python-MySQL connector
- Tkinter Library of Python

Problem Statement

- The manual management of store inventory, sales, purchases, and customer data can be a time-consuming and error-prone process for store owners.
- With the increasing complexity of modern stores and the growing demand for online sales, store owners need a reliable and efficient system to manage their store operations effectively.
- The current manual process for managing store operations is prone to errors, such as incorrect inventory counts, inaccurate sales records, and incomplete customer data. This can lead to lost sales, customer dissatisfaction, and increased operational costs.
- To address these challenges, a store management system implemented using MySQL and Python can provide an automated, scalable, and secure solution for store owners to manage their store operations efficiently.
- The system can help store owners track their inventory levels, manage sales and purchases, and maintain accurate customer records.
- It can also provide real-time reporting and analysis to help store owners make informed business decisions.
- Therefore, the problem statement for this project is to design and implement a store management system using MySQL and Python that is user-friendly, scalable, and secure, which can help store owners manage their inventory, sales, purchases, and customer data effectively.

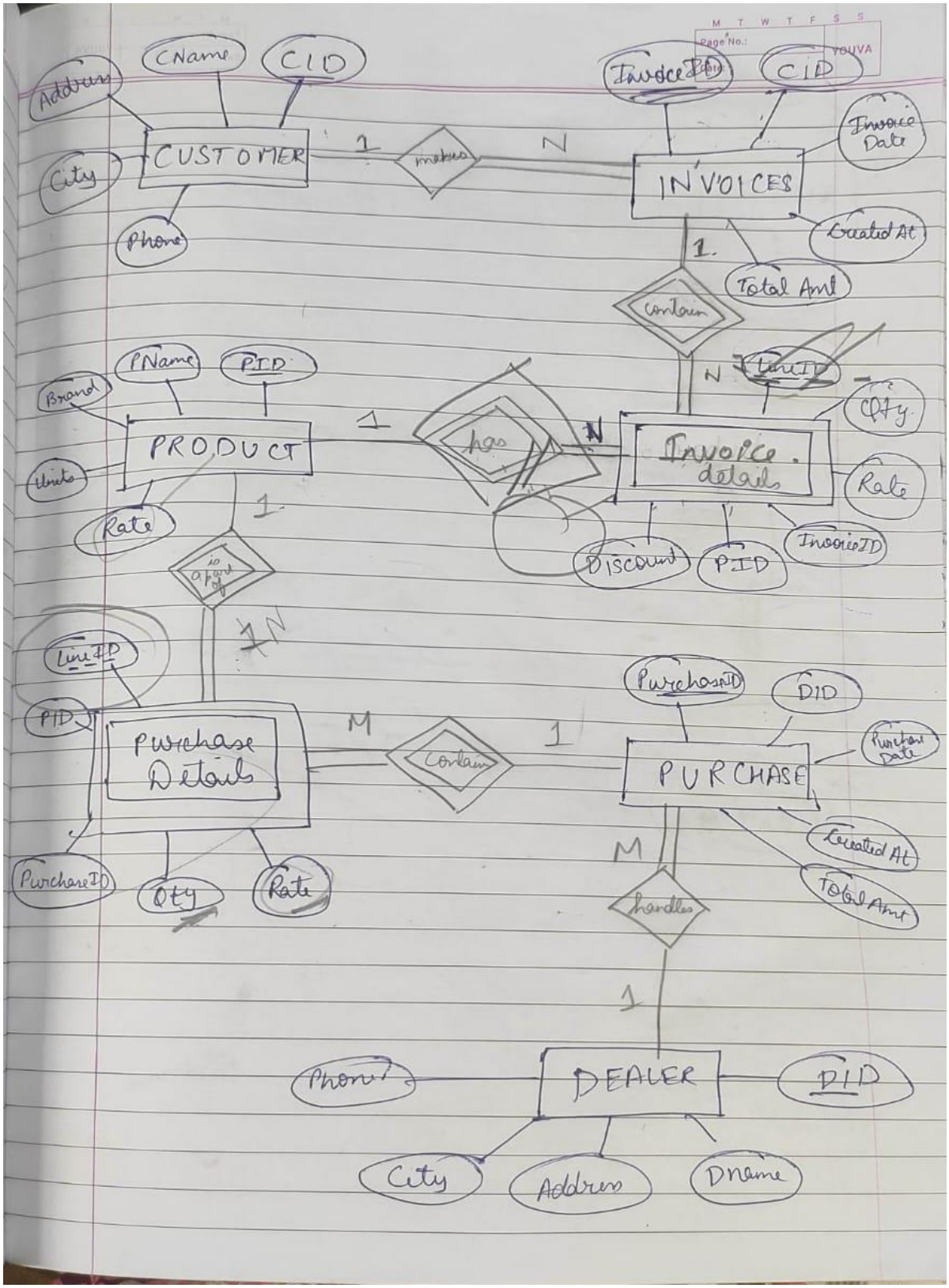
About the Project

- This project aims to design and implement a store management system using MySQL and Python.
- The system will be designed to help store owners manage their inventory, sales, purchases, and customer data more efficiently by automating various processes.
- The project will involve designing the database schema for the store management system, developing the application logic using Python, and creating a user interface that is easy to use and navigate.
- The system will be designed to be scalable, secure, and user-friendly, with real-time reporting and analysis capabilities.
- The store management system will provide several features to store owners, such as inventory management, sales management, purchasing management, user management, and reporting.
- Store owners will be able to add, update, and delete products from their inventory, manage their sales transactions, view their purchase history, manage user accounts and roles, and generate reports on inventory levels, sales, purchases, and profits.

ER-DIAGRAM

1. ***ENTITIES:***
   - *CUSTOMER*
   - *DEALER*
   - *INVOICES*
   - *INVOICE DETAILS (WEAK ENTITY)*
   - *PURCHASES*
   - *PURCHASE DETAILS (WEAK ENTITY)*
   - *PRODUCT*
2. ***ENTITY-RELATIONS:***
   - *CUSTOMER - INVOICES*
   - *PRODUCT - PURCHASE_DETAILS*
   - *INVOICE – INVOICE _DETAILS*
   - *INVOICE _DETAILS – PRODUCT*
   - *DEALER – PURCHASES*
   - *PURCHASES_DETAILS – PURCHASES*

3. ER MODEL:


CUSTOMER
CName
CID
Address
City
Phone
makes
1
N
INVOICES
InvoiceID
CID
Invoice Date
Created At
Total Amt
1
contain
N
LineID
Qty
Invoice details
Rate
Discount
PID
InvoiceID
has
1
N
PRODUCT
PName
PID
Brand
Units
Rate
1
is part of
1 N
LineID
PID
Purchase Details
M
Contain
PurchaseID
Qty
Rate
1
PURCHASE
PurchaseID
DID
Purchase Date
Created At
Total Amt
M
handles
1
DEALER
Phone
DID
City
Address
DName

4. RELATIONSHIP PROPERTIES:

- *CUSTOMER - INVOICES* ***(ONE-TO-MANY)***

  One customer can have many invoices but one invoice will be made by only one customer.

- *PRODUCT - PURCHASE_DETAILS* ***(ONE-TO-MANY)***

  One product can have many purchase details.

  Eg. Two dealers selling the same product can have different quantity,rate and purchase id, i.e., a single product can have multiple entries in purchase_details.

  But a purchase detail will only relate to a single product.

- *INVOICE - INVOICE _DETAILS* ***(ONE-TO-MANY)***

  One invoice can have many invoice details because it contains multiple products but one invoice detail will only belong to one invoice.

- *PRODUCT - INVOICE _DETAILS* ***(ONE-TO-MANY)***

  One product can be a part of multiple invoice details but for one invoice_detail ,i.e.,for one invoice-id , one product can occur only once even though it might have multiple units.

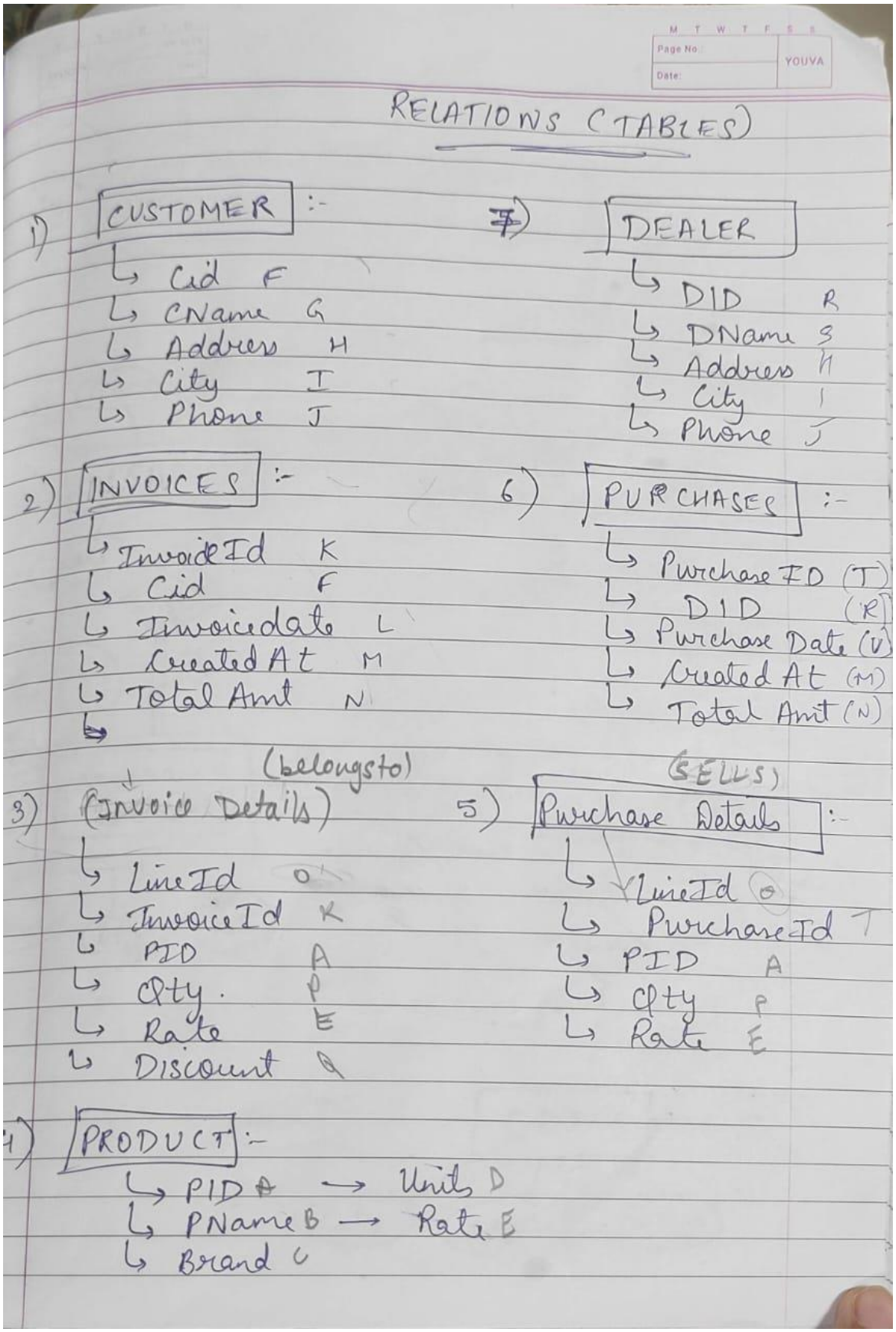
- *DEALER - PURCHASES* ***(ONE-TO-MANY)***

  One dealer can be involved in multiple purchases but one purchase can be only made from a single dealer with single dealer_id.

- *PURCHASES - PURCHASES_DETAILS* ***(ONE-TO-MANY)***

  One purchase can have multiple products which means there will be multiple purchase_details because of multiple Product_ids(PIDs) but one Purchase_detail will only belong to one Purchase similar to the relation Invoice - Invoice_detail.

5. RELATIONAL MODEL:



RELATIONS (TABLES)

1) CUSTOMER :-
- Cid F
- CName G
- Address H
- City I
- Phone J

2) INVOICES :-
- InvoiceId K
- Cid F
- Invoicedate L
- CreatedAt M
- Total Amt N

(belongsto)

3) (Invoice Details)
- LineId O
- InvoiceId K
- PID A
- Qty. P
- Rate E
- Discount Q

4) PRODUCT :-
- PID A → Units D
- PName B → Rate E
- Brand C

7) DEALER
- DID R
- DName S
- Address H
- City I
- Phone J

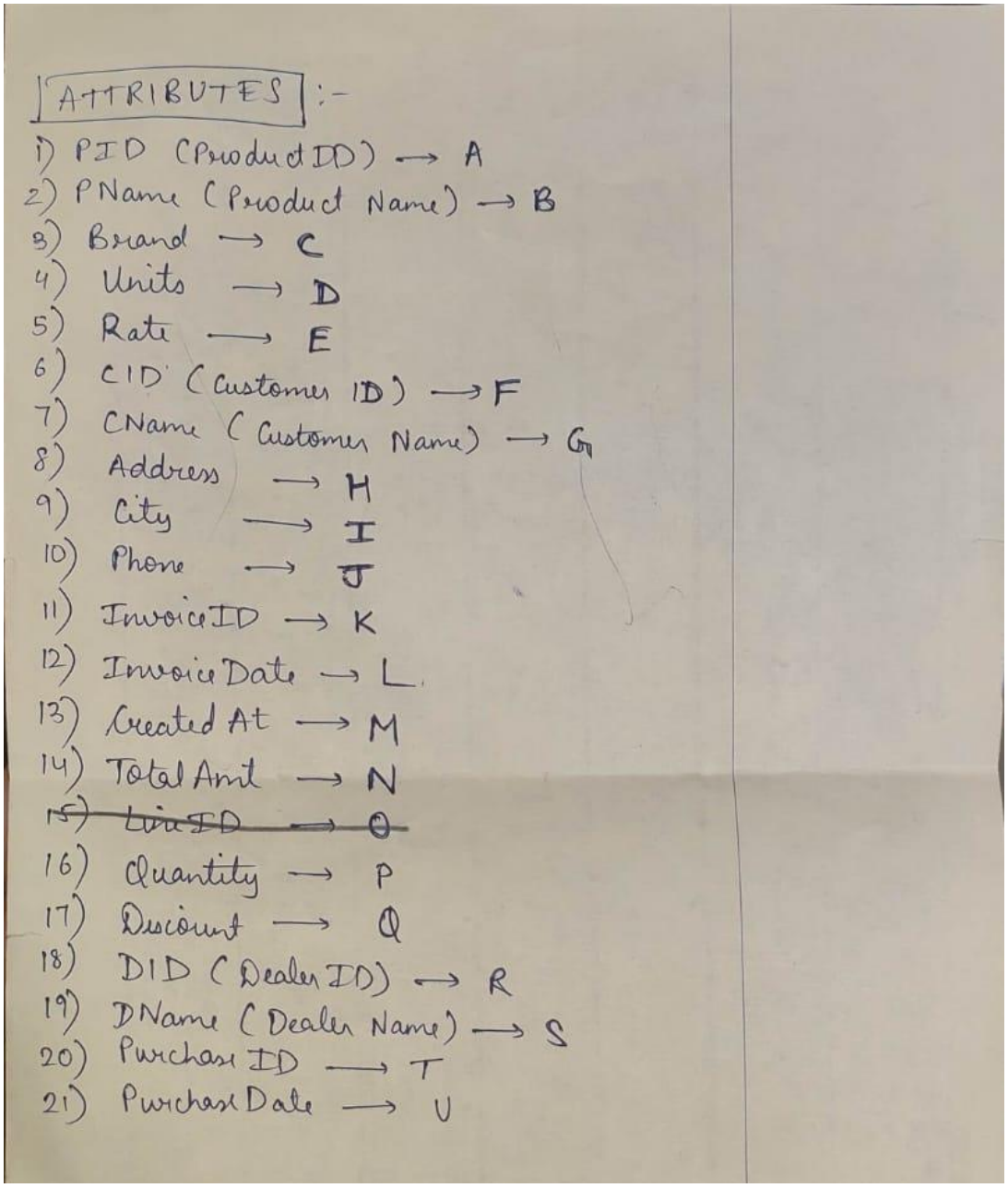
6) PURCHASES :-
- PurchaseID (T)
- DID (R)
- Purchase Date (U)
- CreatedAt (M)
- Total Amt (N)

(SELLS)

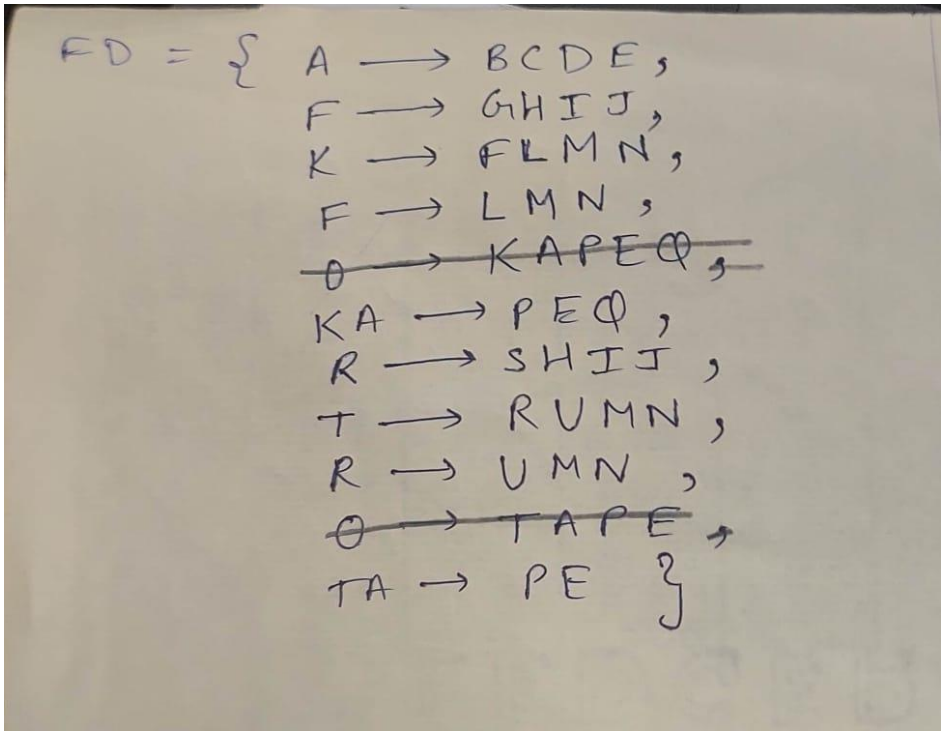
5) Purchase Details :-
- LineId (O)
- PurchaseId T
- PID A
- Qty P
- Rate E

NORMALISATION

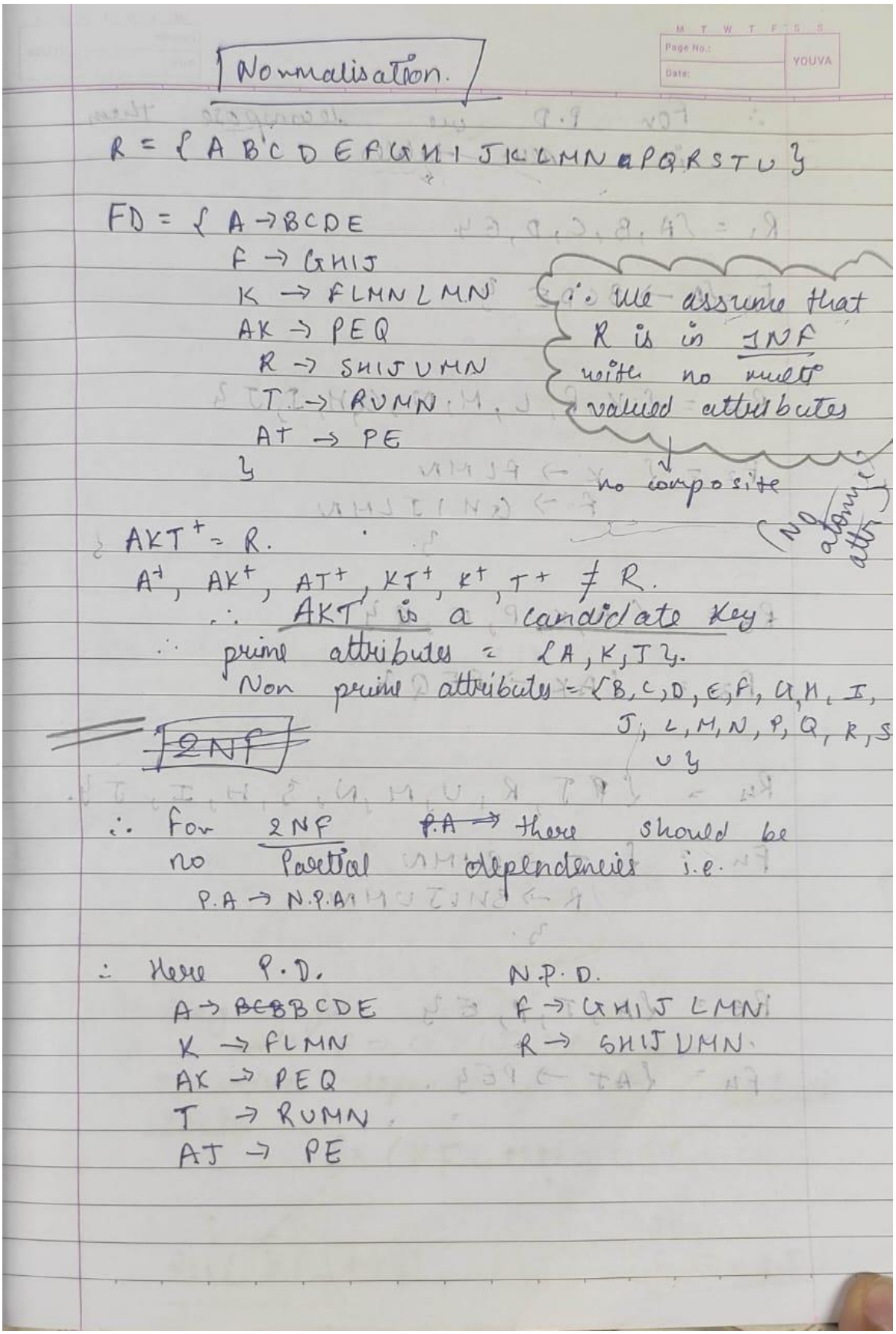
❖ ***ATTRIBUTES:***



❖ ***FUNCTIONAL DEPENDENCIES:***



❖ ***NORMALISATION:***



Normalisation.

R = { A B C D E F G H I J K L M N O P Q R S T U }

FD = { A → BCDE
F → GHIJ
K → FLMN LMN
AK → PEQ
R → SHIJUMN
T → RUMN
AT → PE
}

∴ We assume that R is in 1NF with no multi valued attributes → no composite (No atomic attr)

$AKT^+ = R$.

$A^+, AK^+, AT^+, KT^+, K^+, T^+ \neq R$.

∴ AKT is a candidate key.

∴ prime attributes = { A, K, T }.

Non prime attributes = { B, C, D, E, F, G, H, I, J, L, M, N, P, Q, R, S, U }

~~2NF~~

∴ For 2NF ~~P.A~~ there should be no Partial dependencies i.e.

P.A → N.P.A

∴ Here

P.D.	N.P.D.
A → ~~BCB~~BCDE	F → GHIJ LMN
K → FLMN	R → SHIJUMN.
AK → PEQ	
T → RUMN	
AJ → PE	

∴ For P.D we decompose them in new tables.

$R_1 = \{A, B, C, D, E\}$.

$F_1 = \{A \rightarrow BCDE\}$.

$R_2 = \{K, F, L, M, N, G, H, I, J\}$

$F_2 = \{ K \rightarrow FLMN$
$F \rightarrow GHIJLMN$
$\}$.

$R_3 = \{A, K, P, E, Q\}$

$F_3 = \{AK \rightarrow PEQ\}$

$R_4 = \{T, R, U, M, N, S, H, I, J\}$.

$F_4 = \{T \rightarrow RUMN$
$R \rightarrow SHIJUMN$
$\}$.

$R_5 = \{A, T, P, E\}$

$F_4 = \{AT \rightarrow PE\}$.

∴ Checking R_1

$R_1 = \{A\ B\ C\ D\ E\}$

$F_1 = \{A \rightarrow B\ C\ D\ E\}$.

$A^+ = A\ B\ C\ D\ E$

∴ A is C.K.

∴ ∴ R_1 is in 2NF.

∴ As LHS is CK it is also in 3NF & BCNF

$R_2 = \{K, F, L, M, N, G, H, I, J\}$

$F_2 = \{K \rightarrow F\ L\ M\ N$

$F \rightarrow G\ H\ I\ J\ L\ M\ N\}$.

$K^+ = \{F\ L\ M\ N\ G\ H\ I\ J\}$

∴ $K^+ = R$ ∴ K is C.K.

∴ ∴ R_2 is in 2NF

Checking for 3NF

∴ as $F \rightarrow G\ H\ I\ J\ L\ M\ N$ is a transitive dependency R_2 is not in 3NF

$R_2\ (K\ F\ L\ M\ N\ G\ H\ I\ J)$

$R_{21}(K\ F\ L\ M\ N)$ $R_{22}(F\ G\ H\ I\ J)$

$R_3 = \{ AK\ PEQ \}$

$F_3 = \{ AK \rightarrow PEQ \}$

$\therefore AK^+ = AKPEQ$

$\therefore$ AK is CK.

$\therefore$ R_3 is in 2NF as LHS is CK it also is 3NF & BCNF

$R_4 = \{ T, R, U, M, N, S, H, I, J \}$

$F_4 = \{ T \rightarrow RUMN$
$R \rightarrow SHIJUMN \}$

$T^+ = RUMNSHIJUMNT$

$\therefore$ T is CK.

$\therefore$ R_4 No. partial dependencies

$\therefore$ R_4 is in 2NF.

$\therefore$ as $R \rightarrow SHIJUMN$ is a transitive dependency so we decompose R_4.

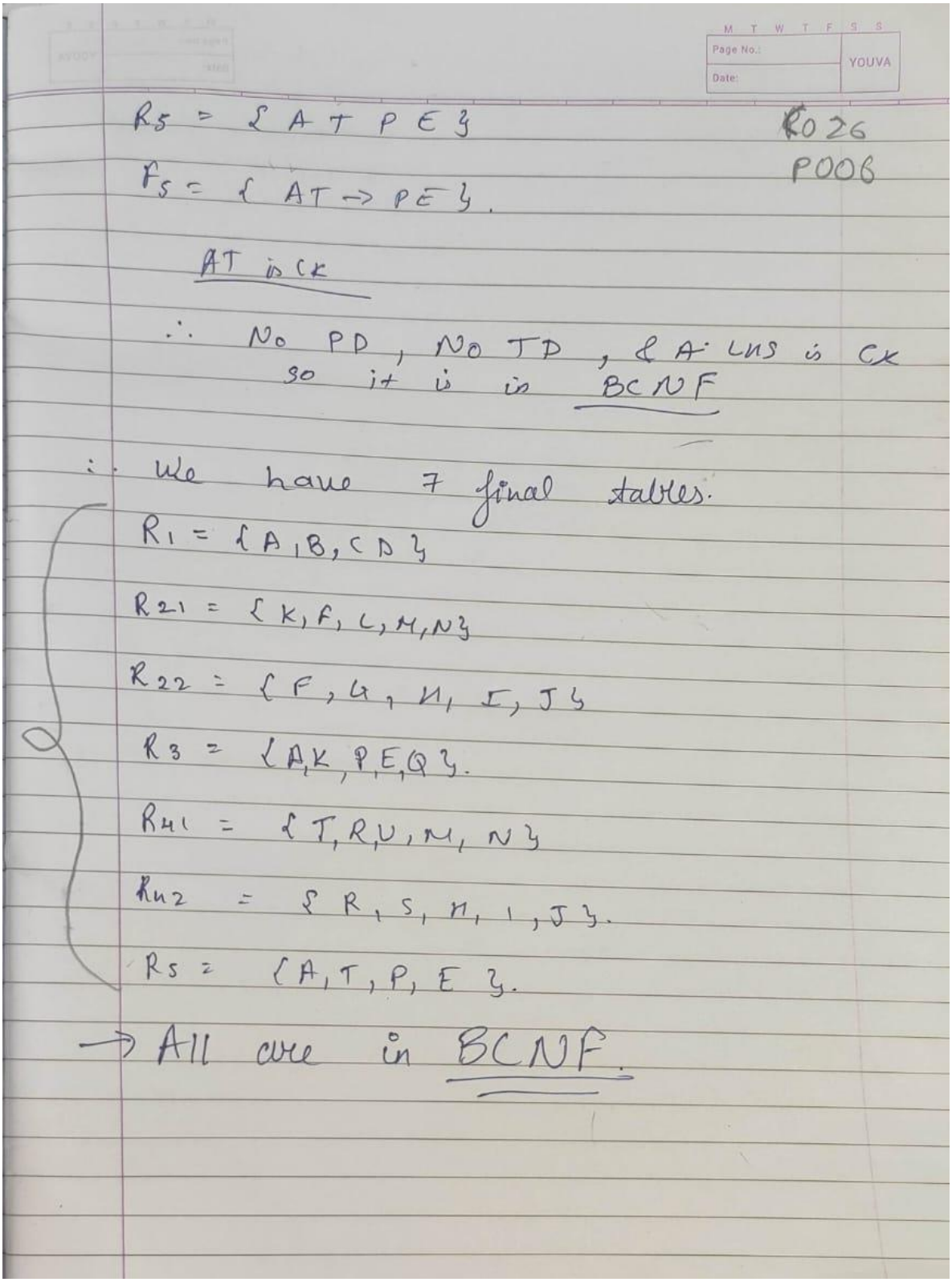
$R_4 (TRUMNSHIJ)$

$R_{41} (TRUMN)$ $R_{42} (RSHIJ)$

$F_{41} = \{ T \rightarrow RUMN \}$ $F_{42} (R \rightarrow SHIJ \}$

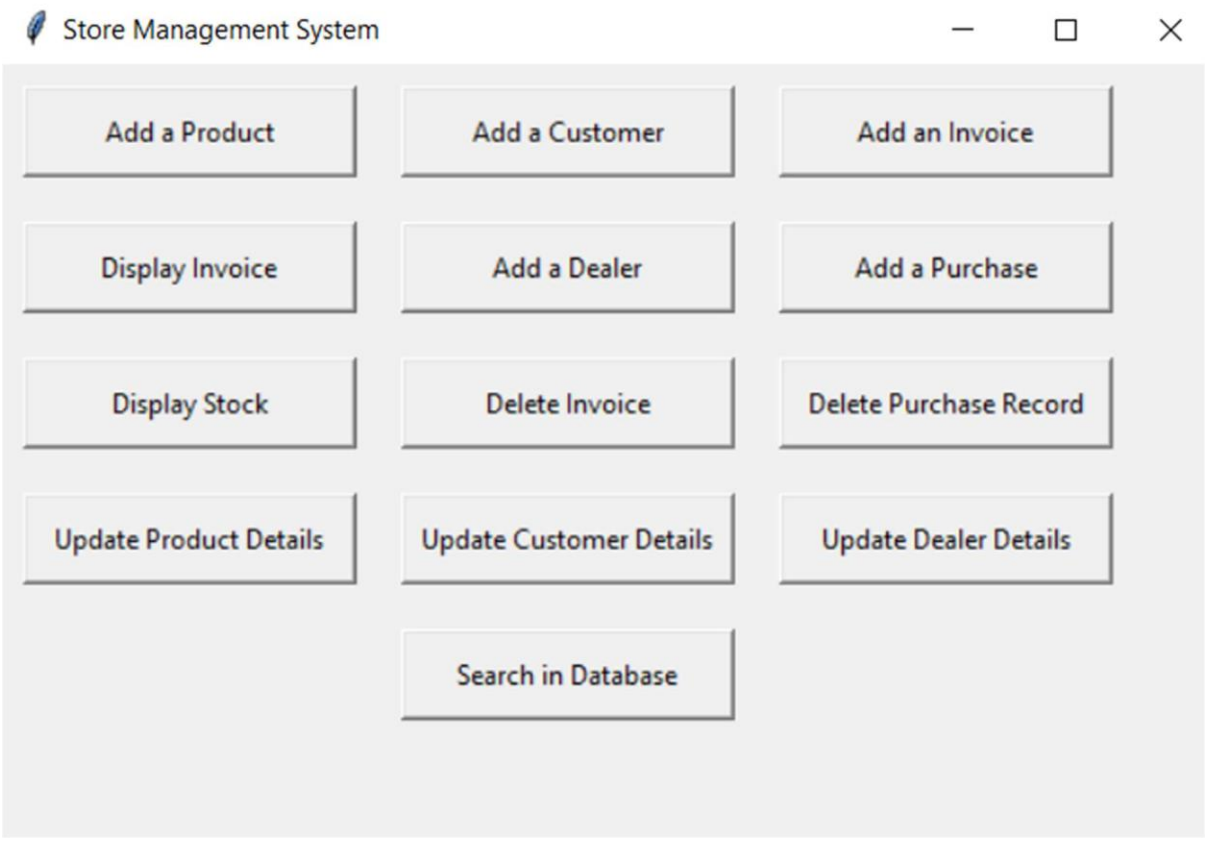
T^+ is CK. R is CK.

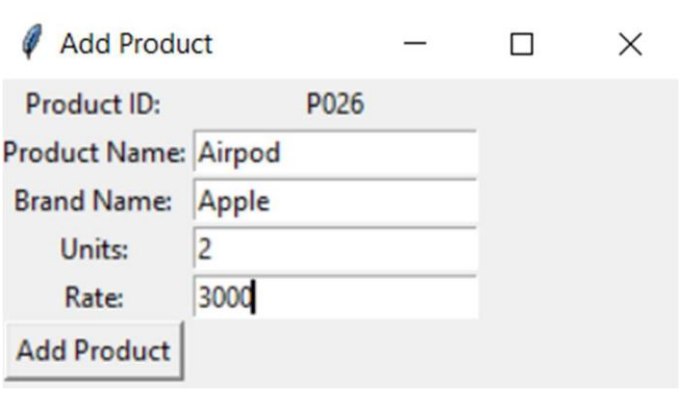
it is in both 3NF & BCNF

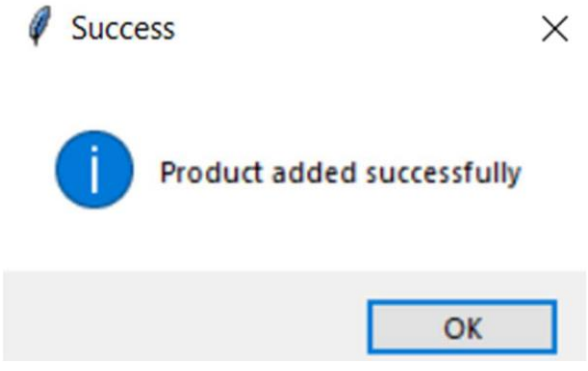


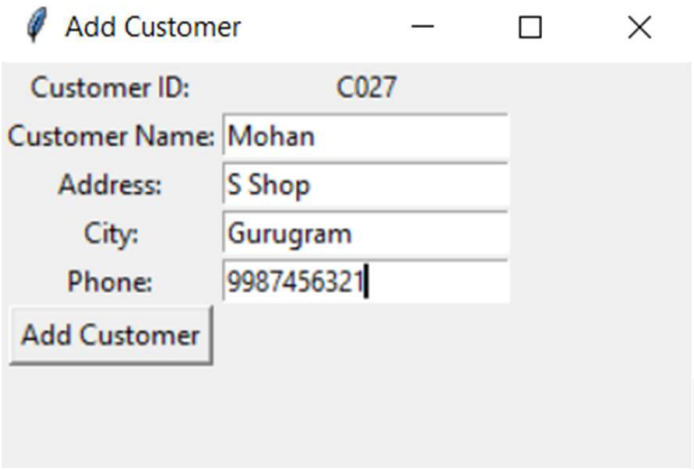
Therefore, we can see that the relation is normalised till BCNF and we get the 7 tables as mentioned before.

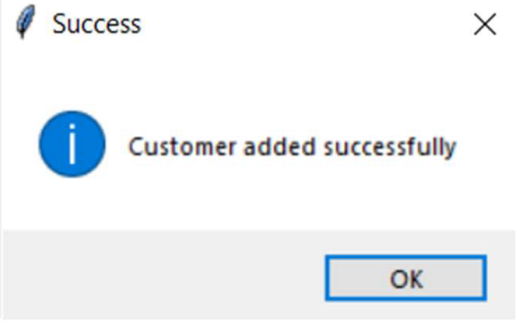
FRONTEND

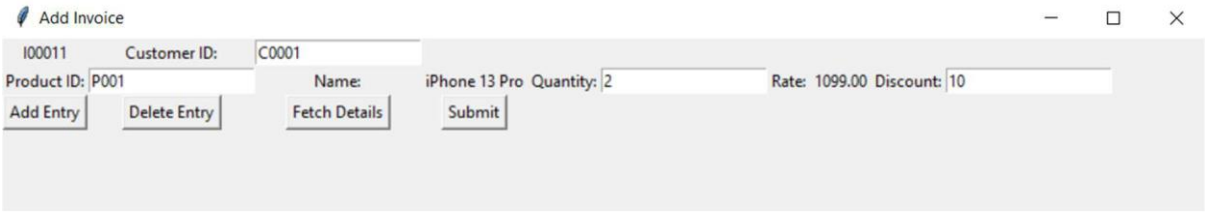

Store Management System
Add a Product
Add a Customer
Add an Invoice
Display Invoice
Add a Dealer
Add a Purchase
Display Stock
Delete Invoice
Delete Purchase Record
Update Product Details
Update Customer Details
Update Dealer Details
Search in Database

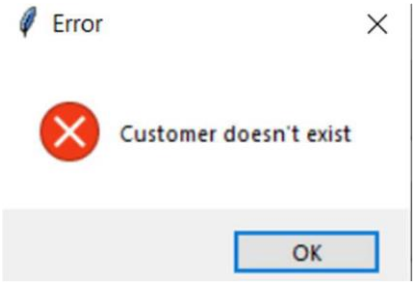

Add Product
Product ID: P026
Product Name: Airpod
Brand Name: Apple
Units: 2
Rate: 3000
Add Product

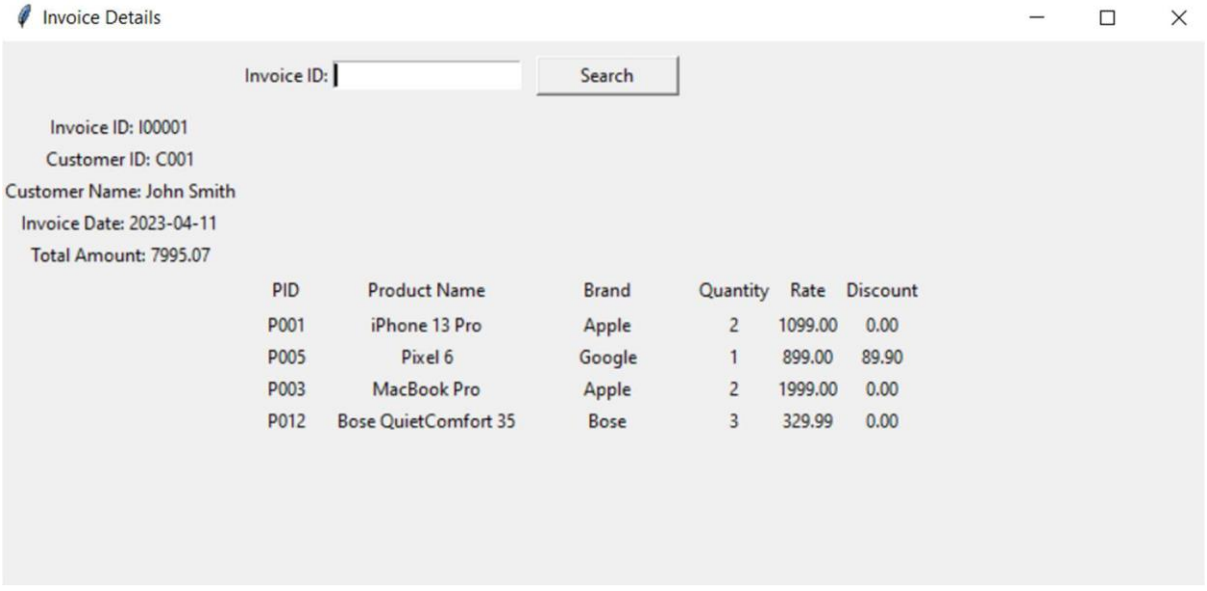

Success
Product added successfully
OK

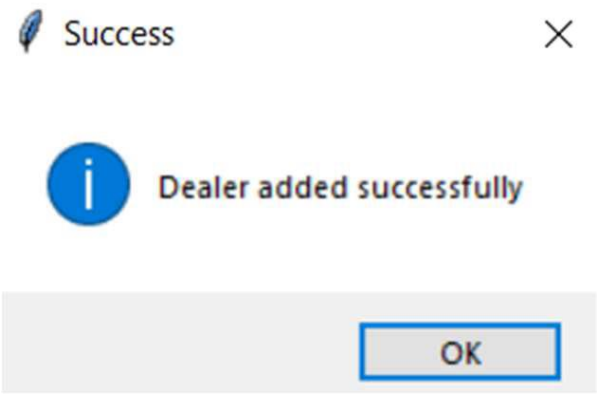

Add Customer
Customer ID: C027
Customer Name: Mohan
Address: S Shop
City: Gurugram
Phone: 9987456321
Add Customer

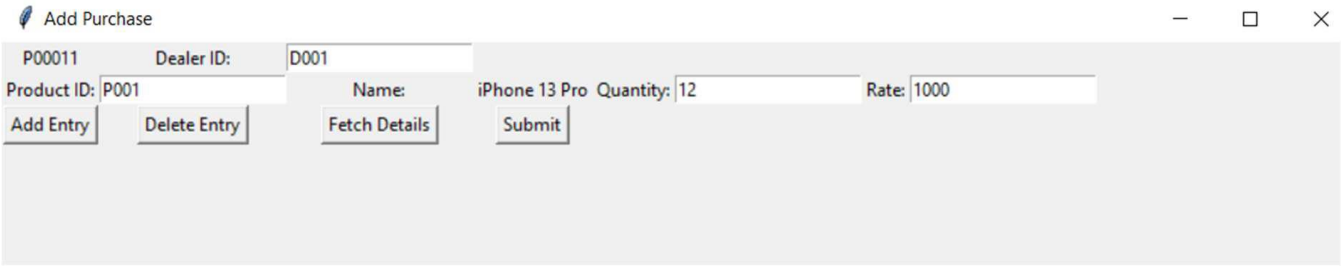

Success
Customer added successfully
OK


Add Invoice
I00011 Customer ID: C0001
Product ID: P001 Name: iPhone 13 Pro Quantity: 2 Rate: 1099.00 Discount: 10
Add Entry
Delete Entry
Fetch Details
Submit


Error
Customer doesn't exist
OK

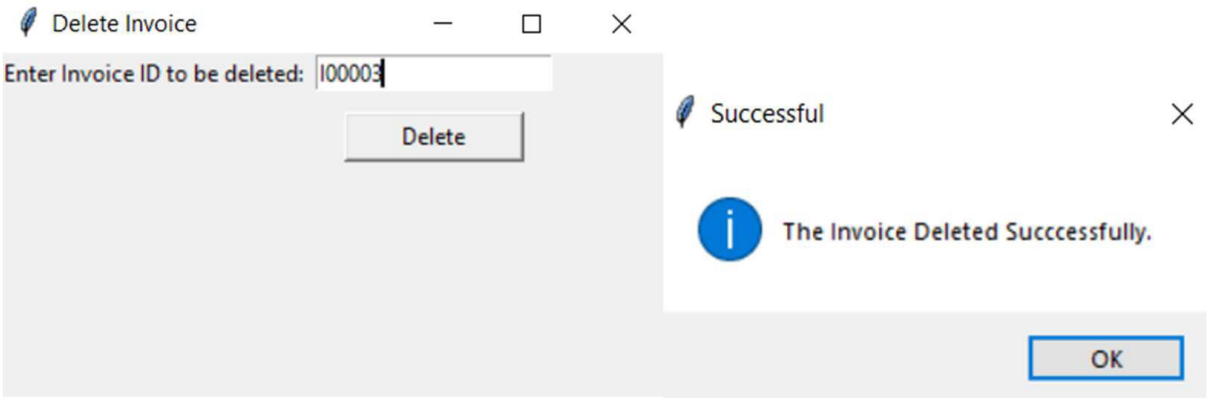

Invoice Details
Invoice ID:
Search
Invoice ID: I00001
Customer ID: C001
Customer Name: John Smith
Invoice Date: 2023-04-11
Total Amount: 7995.07
PID Product Name Brand Quantity Rate Discount
P001 iPhone 13 Pro Apple 2 1099.00 0.00
P005 Pixel 6 Google 1 899.00 89.90
P003 MacBook Pro Apple 2 1999.00 0.00
P012 Bose QuietComfort 35 Bose 3 329.99 0.00

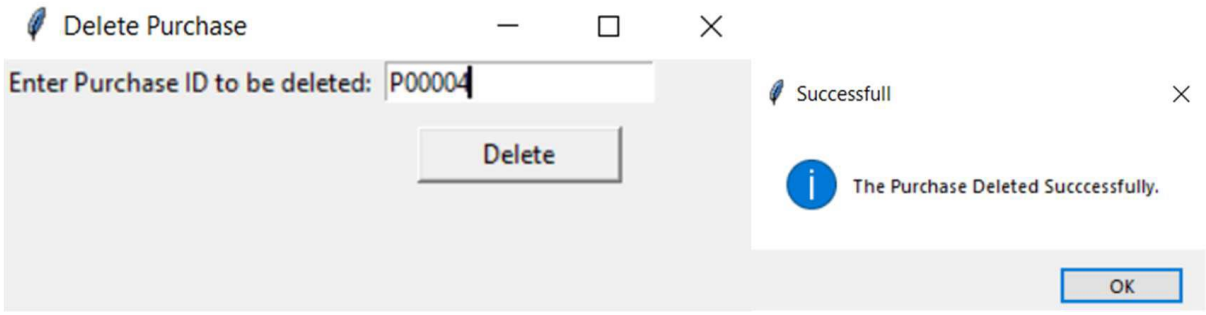


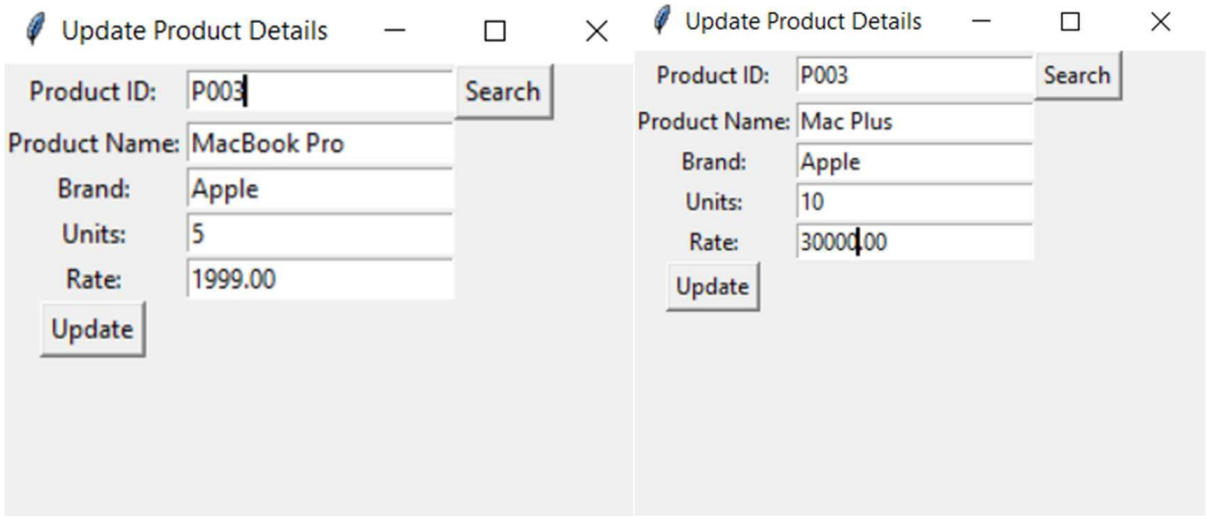


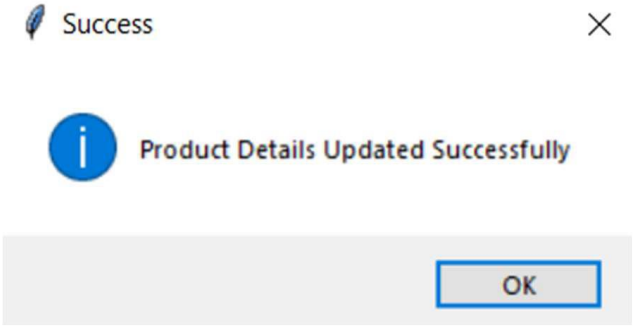
Stock

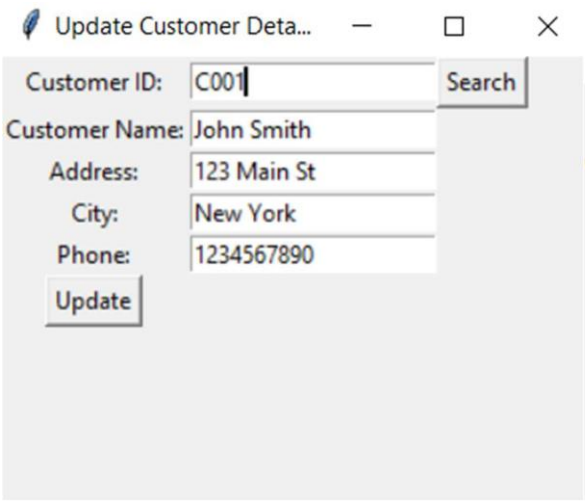
PID	PName	Brand	Units	Rate
P026	Airpod	Apple	2	3000.00
P006	AirPods Pro	Apple	50	249.00
P014	Apple Watch Series 7	Apple	15	399.00
P012	Bose QuietComfort 35	Bose	20	329.99
P017	Canon EOS R6	Canon	7	2499.00
P022	DJI Mavic 3 Pro	DJI	2	1999.00
P011	Fitbit Charge 5	Fitbit	15	179.95
P002	Galaxy S21 Ultra	Samsung	20	1299.99
P007	Galaxy Watch 4	Samsung	25	349.99
P015	Google Nest Hub Max	Google	10	229.99
P020	GoPro HERO10 Black	GoPro	5	399.99
P001	iPhone 13 Pro	Apple	8	1099.00

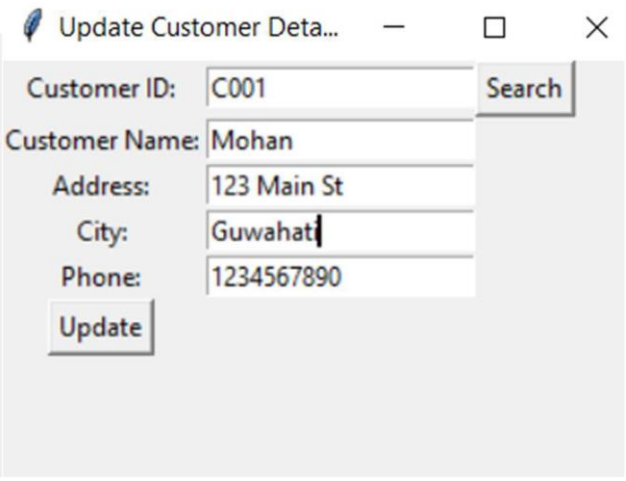

Delete Invoice
Enter Invoice ID to be deleted: I00003
Delete
Successful
The Invoice Deleted Succcessfully.
OK

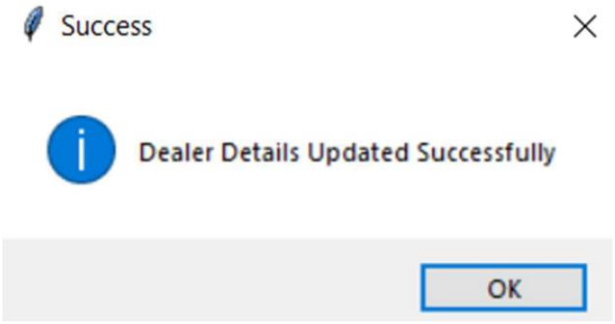

Delete Purchase
Enter Purchase ID to be deleted: P00004
Delete
Successfull
The Purchase Deleted Succcessfully.
OK

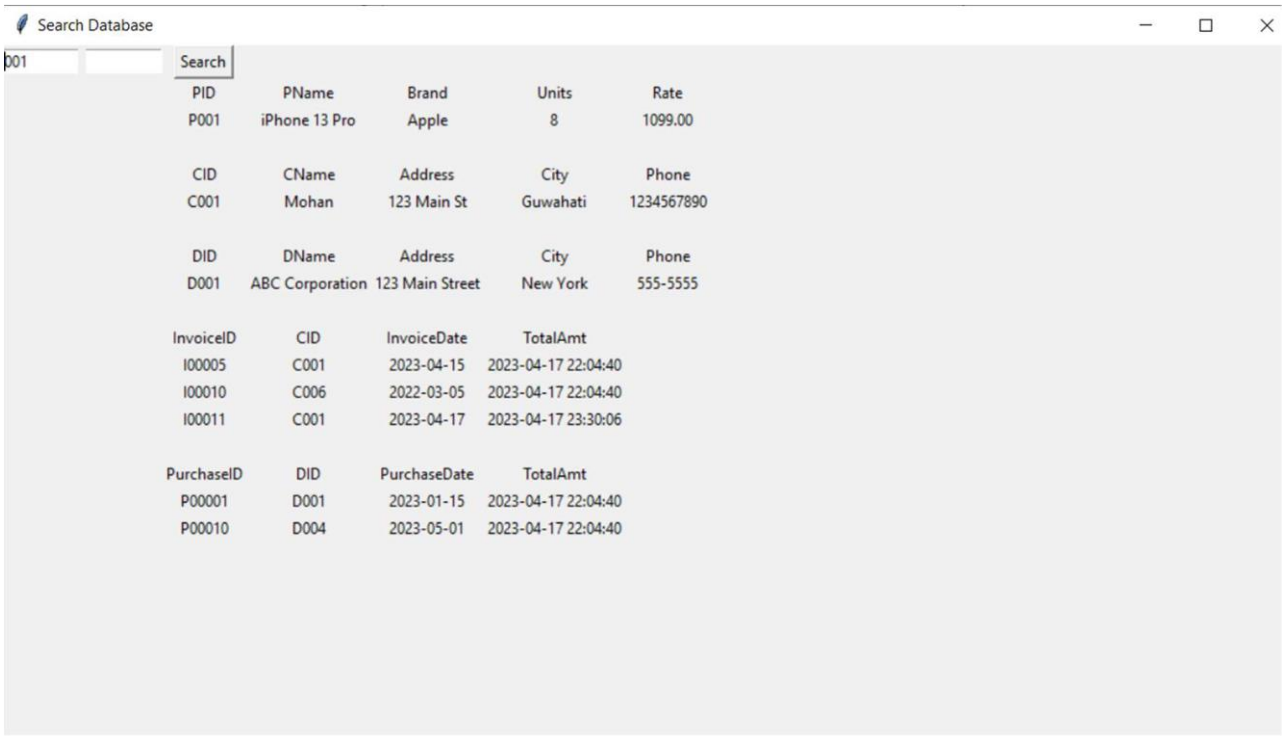

Update Product Details
Product ID: P003
Search
Product Name: MacBook Pro
Brand: Apple
Units: 5
Rate: 1999.00
Update
Update Product Details
Product ID: P003
Search
Product Name: Mac Plus
Brand: Apple
Units: 10
Rate: 3000.00
Update

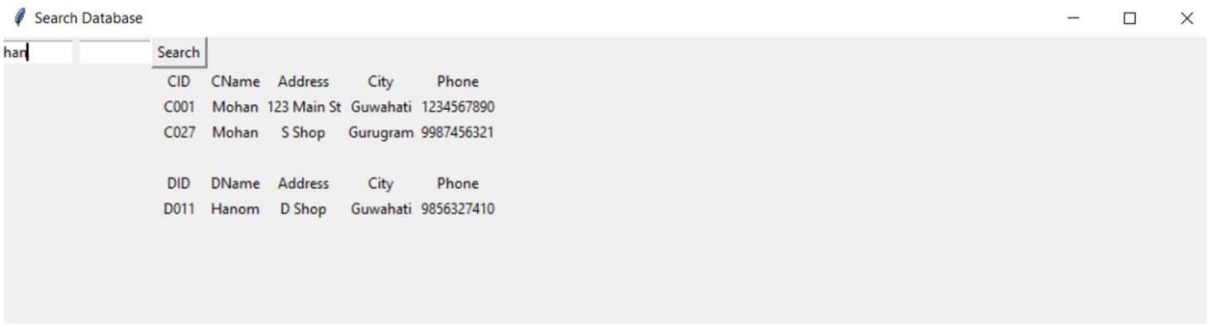

Success
Product Details Updated Successfully
OK

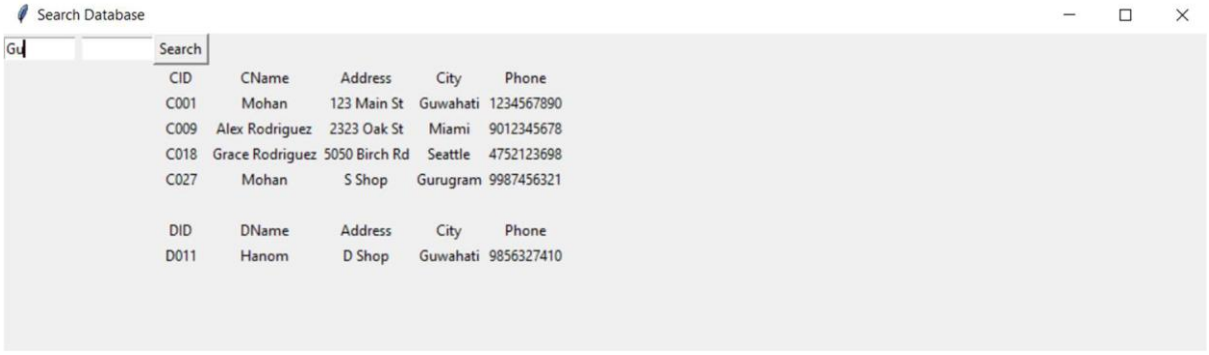

Update Customer Deta...
Customer ID:
C001
Search
Customer Name:
John Smith
Address:
123 Main St
City:
New York
Phone:
1234567890
Update


Update Customer Deta...
Customer ID:
C001
Search
Customer Name:
Mohan
Address:
123 Main St
City:
Guwahati
Phone:
1234567890
Update


Success
Dealer Details Updated Successfully
OK


Search Database
001
Search
PID PName Brand Units Rate
P001 iPhone 13 Pro Apple 8 1099.00
CID CName Address City Phone
C001 Mohan 123 Main St Guwahati 1234567890
DID DName Address City Phone
D001 ABC Corporation 123 Main Street New York 555-5555
InvoiceID CID InvoiceDate TotalAmt
I00005 C001 2023-04-15 2023-04-17 22:04:40
I00010 C006 2022-03-05 2023-04-17 22:04:40
I00011 C001 2023-04-17 2023-04-17 23:30:06
PurchaseID DID PurchaseDate TotalAmt
P00001 D001 2023-01-15 2023-04-17 22:04:40
P00010 D004 2023-05-01 2023-04-17 22:04:40


Search Database
han
Search
CID CName Address City Phone
C001 Mohan 123 Main St Guwahati 1234567890
C027 Mohan S Shop Gurugram 9987456321
DID DName Address City Phone
D011 Hanom D Shop Guwahati 9856327410


Search Database
Gu
Search
CID CName Address City Phone
C001 Mohan 123 Main St Guwahati 1234567890
C009 Alex Rodriguez 2323 Oak St Miami 9012345678
C018 Grace Rodriguez 5050 Birch Rd Seattle 4752123698
C027 Mohan S Shop Gurugram 9987456321
DID DName Address City Phone
D011 Hanom D Shop Guwahati 9856327410

~THANK YOU~