

Project Report On

INVENTORY MANAGEMENT SYSTEM

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Abstract

The Inventory System is a necessity to ensure the continuity of services. Unwanted service interruptions caused by failures can have serious consequences at management as well as financial levels. For efficient business transactions, it is essential to access the current status of all products in an inventory. To achieve all these, it is important to have an efficient inventory management system that includes all minimal details of each product for detailed report. For busy transactional shops, it is a need for a fast and efficient management system. Therefore, we have proposed an “**Inventory System**” with the retailer as the super user. It helps the owner make business easy and keep in track with all the items bought in and sold out of his shop. The system aims at providing a detailed overview of all the transactions so as to keep a proper check on them and in turn ensuring an efficient flow of goods in and out of the shop.

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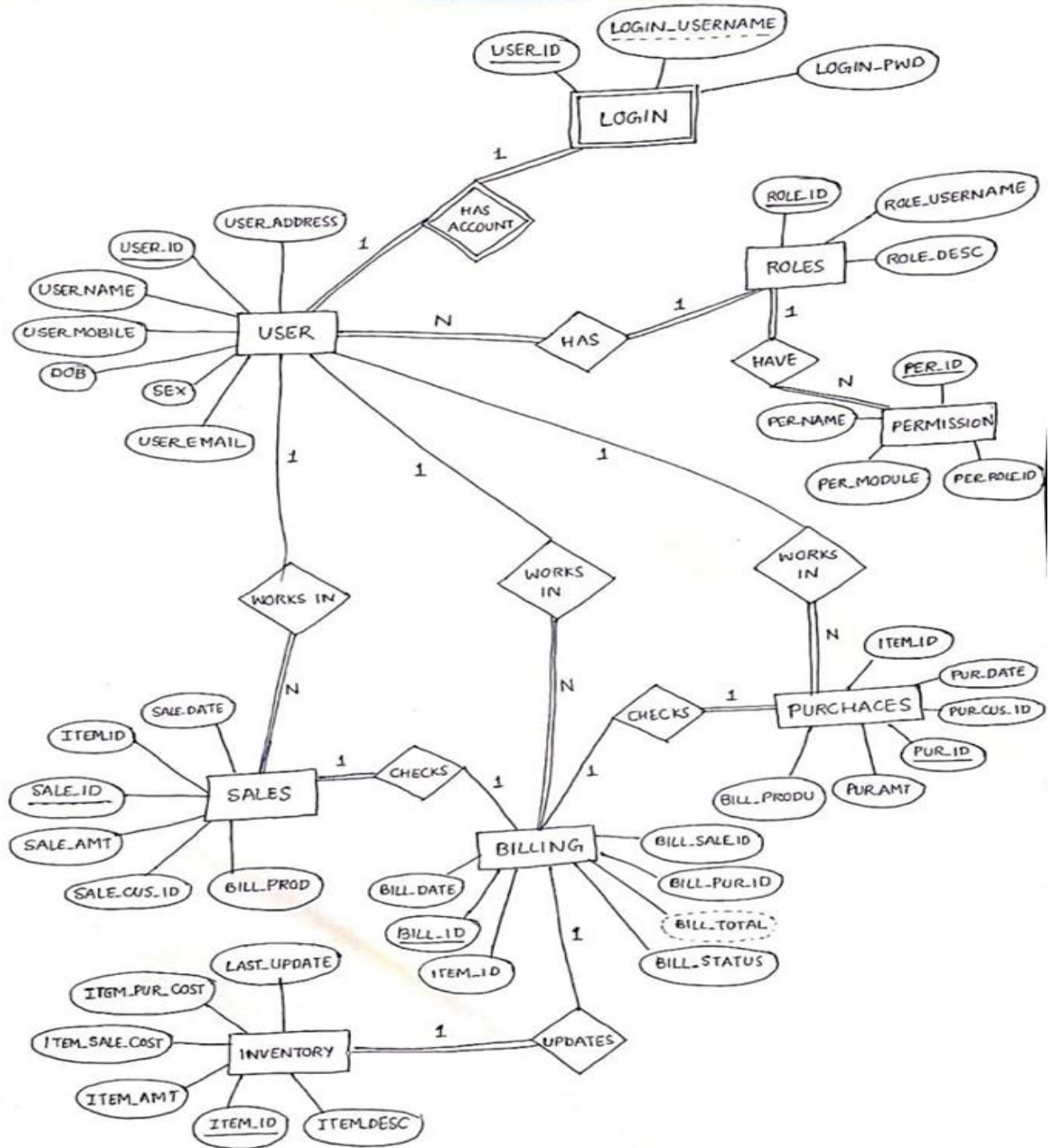
Introduction

The project aims at designing an inventory management with utmost efficiency and minimal redundancy. It is for those retailers whose shops' stock needs proper maintenance which includes purchases and sales to keep track of all the transactions taking place. Here, we have considered a shop which deals with electronics. The super user sits at the top of the user hierarchy having all the permissions to access the different components of the inventory system. Each user has a set of roles and permissions which determine his accessibility to the system, i.e. different tables are accessible to him depending on his position in the user hierarchy. The 'Sales' and 'Purchases' departments operate independently for their respective set of users. The system provides its users with their accessibility permissions to avoid misuse of data. This project has been designed keeping in mind the perks of data abstraction to ensure an increased amount of security and to avoid inconsistencies and mishandling of data.

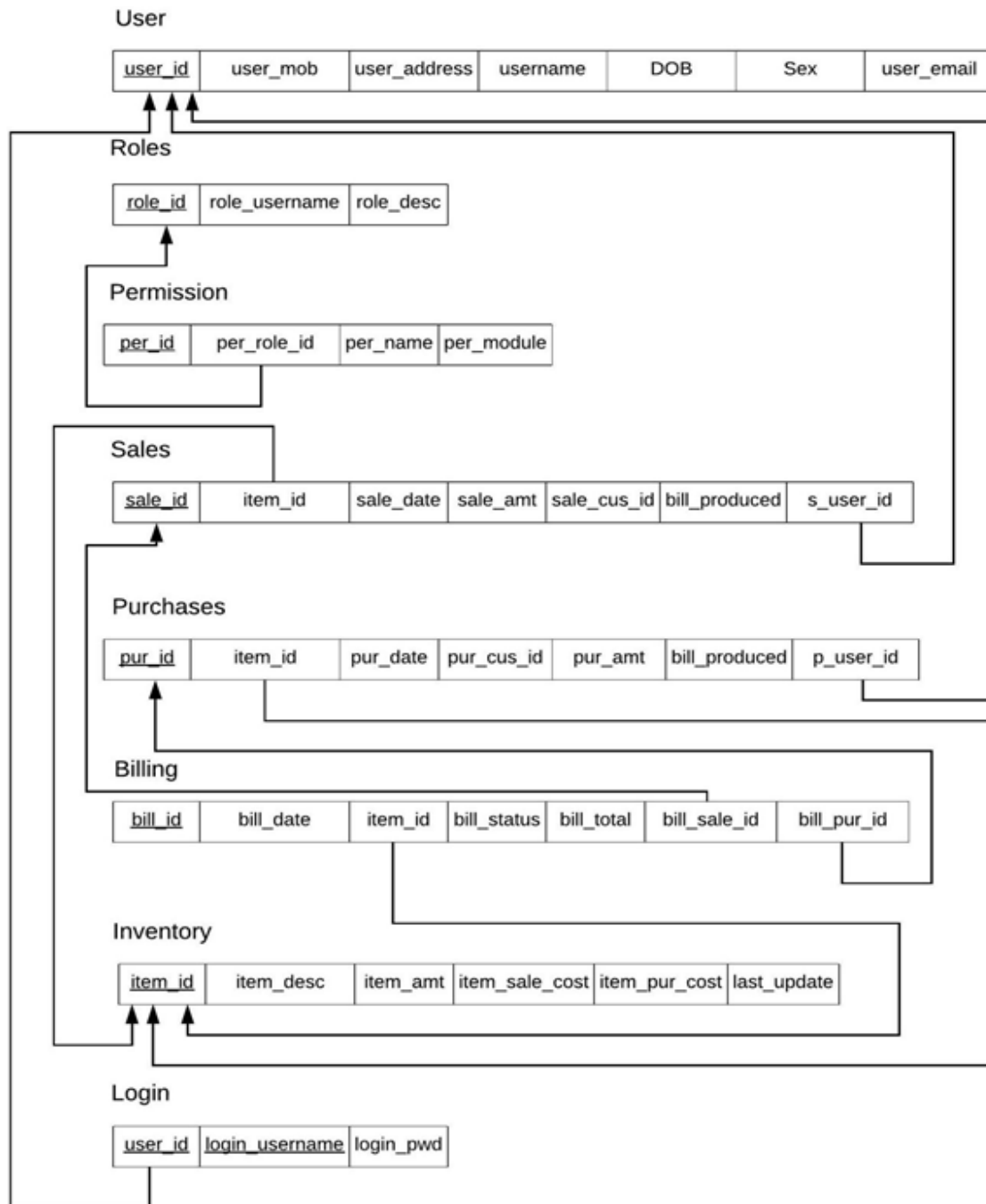
Functional Requirements

Sales & Purchases	Records transactions of sales and purchases to be updated in the inventory after billing.
Billing	Officialises the transaction so inventory can be updated.
Users	Restricted access to the database depending on the user.
Inventory	List of items in stock.

ER Diagram



ER to Relational Mapping



Tables and Constraints

User Entity

Attribute	Datatype	Constraint
User_name	varchar2	Not null
User_mobile	number	Not null
User_id	number	Primary Key
DOB	date	
Sex	char	Sex in (M,F)
User_email	varchar2	
User_address	varchar	

Login Entity

Attribute	Datatype	Constraint
Login_id	number	Primary Key
Login_role_id	number	
Login_username	varchar2	Not null
Login_password	varchar2	len(Login_password)>8 and len(Login_password)<32

Roles Entity

Attribute	Datatype	Constraint
Role_id	number	Primary Key
Role_name	varchar2	Not Null
Role_desc	varchar2	

Permission Entity

Attribute	Datatype	constraint
Per_id	number	Primary Key
Per_role_id	number	
Per_name	varchar2	Not Null
Per_module	varchar2	Not Null

Billing Entity

Attribute	Datatype	constraint
Bill_id	number	Primary Key
Item_id	number	Foreign Key Inventory (Item id)
Transaction_id	number	Foreign Key
Bill_Total	number	Not null
Bill_date	date	
Bill_status	varchar	Default 'Pending'

Sales Entity

Attribute	Datatype	constraint
Sale_id	number	Primary Key
Item_id	number	Foreign Key Inventory(Item_id)
Sale_cus_id	number	
Sale_amt	number	Not Null
Sale_date	date	
Bill_produced	varchar	Bill_produced in (Yes, No)

Purchases Entity

Attribute	Datatype	constraint
Pur_id	number	Primary Key
Item_id	number	Foreign Key Inventory (Item_id)
Pur_cus_id	number	
Pur_amt	number	Not Null
Pur_date	date	
Bill_produced	varchar	Bill_produced in (Yes, No)

Inventory Entity

Attribute	Datatype	constraint
Item_id	number	Primary Key
Item_desc	varchar2	
Item_amt	number	Default 0
Item_pur_cost	number	Not Null
Item_sale_cost	number	Not Null
Last_Update	date	

Functional Dependencies

User Entity

User_id -> Attribute

User_id -> User_name

User_id -> User_mobile

User_id -> DOB

User_id -> Sex

User_id -> User_email

User_id -> User_address

Login Entity

Login_id -> Attribute

Login_id -> Login_role_id

Login_id -> Login_username

Login_id -> Login_password

Roles Entity

Role_id -> Attribute

Role_id -> Role_name

Role_id -> Role_desc

Permission Entity

Per_id -> Attribute

Per_id -> Per_role_id

Per_id -> Per_name

Per_id -> Per_mobile

Billing Entity

Bill_id -> Attribute
Bill_id -> Item_id
Bill_id -> Transaction_id
Bill_id -> Bill_total
Bill_id -> Bill_date
Bill_id -> Bill_status

Sales Entity

Sale_id -> Attribute
Sale_id -> Item_id
Sale_id -> Sale_cus_id
Sale_id -> Sale_amt
Sale_id -> Sale_date
Sale_id -> Bill_produced

Purchases Entity

Pur_id -> Attribute
Pur_id -> Item_id
Pur_id -> Pur_cus_id
Pur_id -> Pur_amt
Pur_id -> Pur_date
Pur_id -> Bill_produced

Inventory Entity

Item_id -> Attribute
Item_id -> Item_desc
Item_id -> Item_amt
Item_id -> Item_pur_cost
Item_id -> Item_sale_cost
Item_id -> Last_Update

Normalization

User Entity

Each attribute contains only atomic values. Hence it is in 1NF.

The relation has full functional dependency. No subset of candidate key determines the other attributes. The table is in 2NF

The table doesn't have transitive dependency as the primary key is determining the non-prime attributes. It's in 3NF.

Login Entity

Attributes only contain atomic values and have no partial or transitive dependency. This relation is in 3NF.

Roles Entity

It's in 1NF and 2NF as there is no duplication and no partial dependency. As there is no transitive dependency it's in 3NF.

Permission Entity

There is no partial dependency and no transitive dependency. So, it's in 3NF.

Billing Entity

Primary key is the only candidate key. This primary key determines non-prime attributes with no partial dependency. Hence, it's in 3NF.

Sales Entity

Candidate keys determine non-prime attributes in the table. It shows full dependency and no non-prime attribute determines a non-prime attribute. Hence, it's in 3rd NF.

Purchases Entity

Attributes only contain atomic values and have no partial or transitive dependency. This relation is in 3NF.

Inventory Entity

Each attribute contains only atomic values. Hence it is in 1NF. The relation has full functional

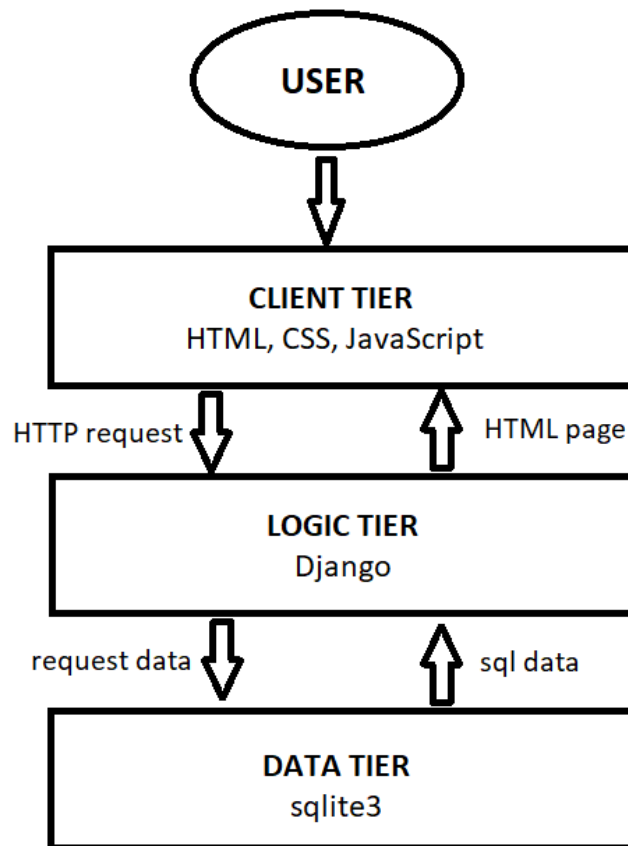
dependency. No subset of candidate key determines the other attributes. The table is in 2NF. The table doesn't have transitive dependency as the primary key is determining the non-prime attributes. It's in 3NF.

Implementation

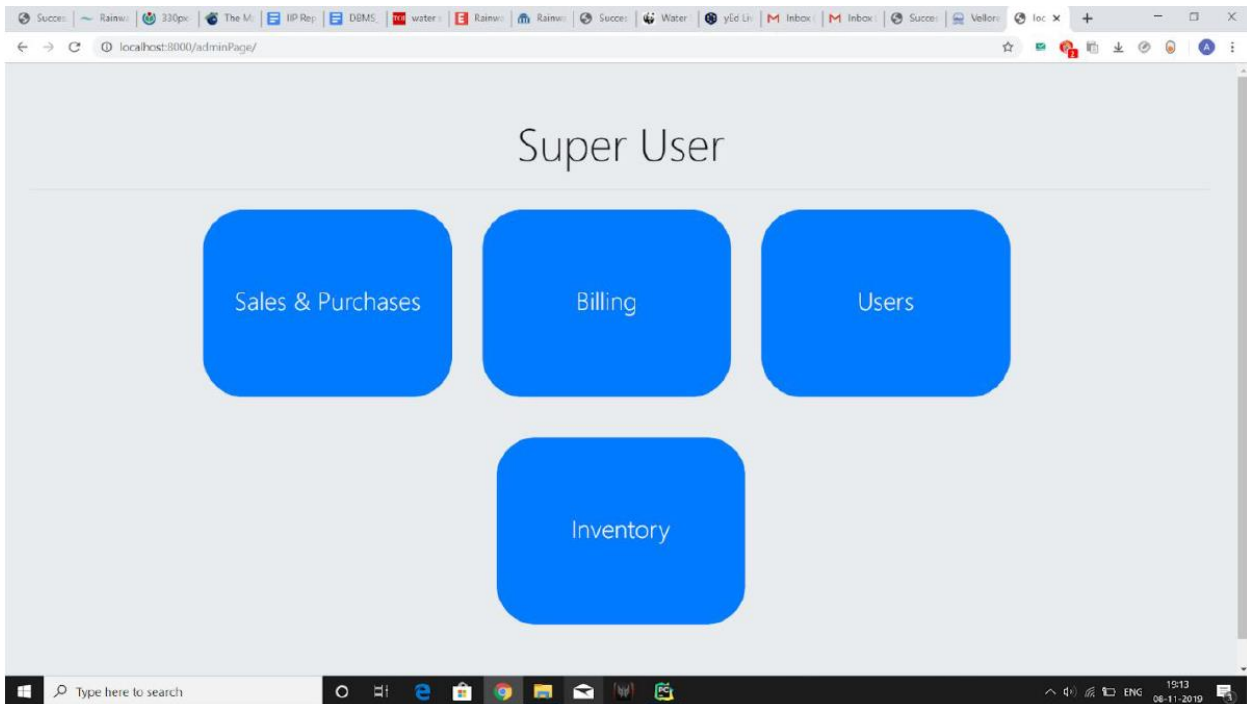
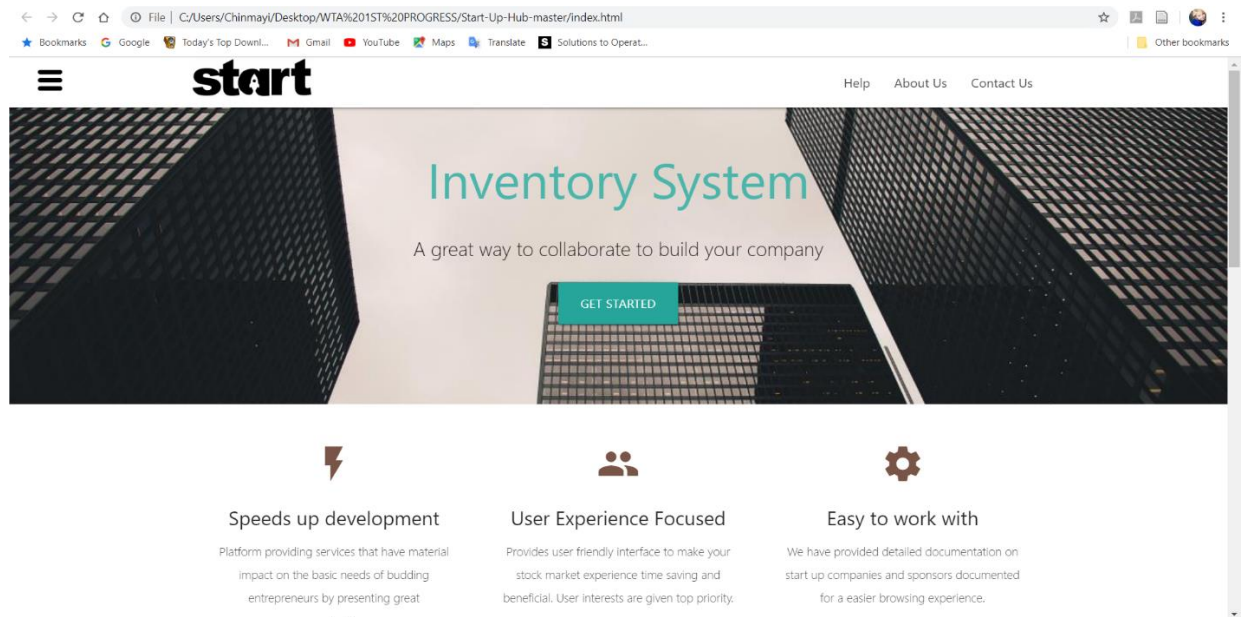
Tools and technologies used:

1. Frontend - Html, CSS, Javascript
2. Backend Framework - Django
3. Database - sqlite3

Application Architecture:



Screenshots



localhost:8000/sample2/

Purchases

Purchase Id

Item Id

Purchase Customer Id

Purchase Amount

Purchase Date

[Submit](#)

[Sign Out](#)

No good by this item id exists in the inventory

Transaction Id	Type	Item Id	Transaction Customer Id	Transaction Amount	Transaction Date	Bill Produced
PR01	P	IT04	cus0012	20	Nov. 4, 2019	True
PR02	P	IT20	cus4232	100	Nov. 3, 2019	True
PR41	P	IT01	cus2341	65	Oct. 4, 2019	True
PR12	P	IT02	cus2345	200	Nov. 6, 2019	True
PR13	P	IT07	cus2345	210	Nov. 4, 2019	True

localhost:8000/sample3/

Sales

Sale Id

Item Id

Sales Customer Id

Sales Amount

Sales Date

[Submit](#)

[Sign Out](#)

Sales already exists

Transaction Id	Type	Item Id	Transaction Customer Id	Transaction Amount	Transaction Date	Bill Produced	Change
SL01	S	IT04	cus0231	20	Oct. 4, 2019	True	
SL03	S	IT03	cus0223	40	Nov. 1, 2019	True	
SL02	S	IT05	cus4232	100	Nov. 2, 2019	True	

Individual Contribution

Chinmayi C. Ramakrishna (181IT113)	Sales & Purchases, ERD and Relational Mapping
K.Keerthana (181IT221)	Inventory and Billing

References

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