CS2310 Milestone #2 Report

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Title: Restaurant Inventory Management System

Data Input:

The system requires the purchaser to input the purchase detail into the database and the system will use these purchase histories as training data to calculate purchase plan. Following is an example of data entry

item	purchase date	supplier	unit	unit price	volume	total price
Pork	14-Nov	Weiss meats	pound	2.33	100	233
Beef	14-Nov	Weiss meats	pound	3.21	50	160.5
Green bean	14-Nov	Lotus Food	pound	3.5	20	70
Pickled cucumber	14-Nov	WingFatHong	can	1.99	30	59.7

Database Design

The database will consist of 5 tables:

Item:

itemID	name	picture	description	Perish period	Exclusive supplierID

Supplier:

supplierID	name	phone	email	address

Inventory:

itemID	current volume	Weekly volume	Required volume

SupplyInfo

ID	itemID	supplierID	purchase freq	last date	last price	average price

Purchase:

purID	purchase date	supplierID	total price	receipt

Transaction:

TranID	itemID	supplierID	purID	date	unit	unit price	volume	total price

Algorithm Design

The purchaser first needs to set up a purchase schedule, for example, he will go for a purchase every Wed and Fri. So, by checking the system date, the system will generate a purchase plan for him at mid night of that day.

```
PurchasePlanGenerator
{
    For every item in the inventory table
        {
            if (item.currentVolume<item.requiredVolume)
                {
                    GenerateItemEntry(item);
                }
        }
}
```

To generate an item entry, we need to know two things, the volume of this item in this purchase and which supplier you should go. It is fairly easy to know the purchase volume.

Purchase volume=(perish period-cushion) * weekly volume

For the supplier choice, it is not easy, and it is the core function of this system right now. To choose from different suppliers, we need to develop an algorithm to analysis the purchase history of this item in the transaction table. There are multiple principles we can apply:

- Exclusive supplier
- Lower average price
- Lower last price
- Higher purchase frequency
- Lower purchase frequency
- Price trend

We can use slow intelligence principle to adaptively select from these roles. At first when data is sparse, the system will suggest lower purchase frequency first to give every supplier their chance. After a while when we have enough data, we can adaptively choose other roles, by saying adaptive, we mean if we

choose a role and it turned out to be a bad decision, we choose another role next time. The detail of the adaptive selection is my next step.