**CSC3170 Project Speech Draft**

**(Part for ER Diagram and Relation Schema)**

[1] Our project topic is “A Supermarket Management Database System Based on Entity-Relationship Model”.

**(ER Diagram部分)**

[2] We designed a supermarket management database system, which includes five subsystems, which are product management system, product supply system, product sales system, employee management system, and marketing reporting system. This is the ER Diagram for our database. (配带Relation的原始ER图，划分五个系统的部分，使用方框进行标记)

[3] As shown in the diagram, the product management system includes the table products, product variants, variant discounts, and product management records. (配产品管理系统部分的ER图，以及每个table展示具体样例图)

We consider that each product has variants of different styles, product information is stored in the products table, and variant information is stored in product variants. Take Deluxe milk as an example. Deluxe milk is stored in products, but different types of variants, such as Deluxe milk 16 boxes, 32 boxes, bottles, cans, etc., we know the product ID In this case, use another variant id to uniquely identify it, so that the primary key of product variants is the combined key of product id and variant \_id.

The variant discounts records the discounts of a unique variant during a period of time. And the product management records store the information of warehouse change quantity and shelf change quantity, in addition with some information about the date, time, employee, etc.

[4] The product supply system includes the table supply records, suppliers, and supplier contacts. For each supply record, we can determine its supplier, and for each supplier, there may have many contacting people. (配产品供货系统部分的ER图，以及每个table展示具体样例图)

[5] The product sales system includes the table transaction records, transaction details, customers, and reduction promotions. For each transaction records, we record the information of the customers, and we also have corresponding transaction details storing the information of purchasing quantity of each product and the discounted price. The sum will be the initial amount in transaction records. Then based on the reduction promotions among the whole supermarket, we get the final discounted amount. (配产品销售系统部分的ER图，以及每个table展示具体样例图)

[6] The employee management system includes the table employees, and it is connected with the product management records and the transaction records, because each record should also store the employee id to represent which employee did this operation. Additionally, it also stores some other employees like floor cleaners or supervisors, who are not directly displayed in other parts of this database. (配员工管理系统部分的ER图，以及每个table展示具体样例图)

[7] Finally, our supermarket is a business supermarket, so it must be inseparable from the summary of sales reports. We finally made three tables, inventory records, expense records, and sales reports to store the weekly, monthly, or yearly marketing reports. (配营业报告系统部分的ER图，以及每个table展示具体样例图)

**(RS部分)**

[8] This is the Relation schema created from the ER diagram. (配化成RS之后的类ER图) In order to clearly show the relation schema, we use such diagram to show it. In this diagram, the yellow attributes are primary key, and the red attributes are served as both primary key for this table and a foreign key to another table. Namely, it is the weak entity. For example, the product variants is rely on the products table, and the transaction details is rely on transaction records. Then the rhombus with red border, also denoted with prefix fk are the foreign keys referencing other tables. In our design, we carefully handle the functional dependencies and multivalued dependencies so that only primary keys in all the tables have FD and MVD to other nonprime attributes, and all the tables are in at least third normal forms.