

Project Proposal

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Project:

1. Project description

This project will create a database system for shops. The domain of the project is to record the information of the sales and customers. This system will focus on product categories, sales, customer purchase history, VIP tiers, and more. In this model, sellers can easily understand the sales and customer purchasing preferences for a specific period. Therefore, they are able to run their stores better.

Users are able to add, delete or update information about products and customers. In addition, they are able to check the order information and turnover. Therefore they could better manage the shop.

I will use MySQL and Python to create the application.

2. ER diagram

The application will record information on customers who have consumed in the shop. Attributes include customer ID, name, gender, phone number, address, date of birth, VIP tiers and their VIP points. The primary key is the customer ID. Customers could earn points when shopping, which can improve their VIP tiers and enjoy different discounts.

Each customer has a VIP tier. Attributes of VIP tiers are VIP ID, VIP type, the range of points, and the discounts. The relationship between customers and VIP tiers is a one-to-many relationship, and customers are in total participation in the relationship.

Each customer could order several orders, with attributes of order id, date, amounts, order type, and points that they earn. Attribute OrderType is used to discriminate subclasses (offline and online). The relationship between customers and orders is a one-to-many relationship, and participation of orders is total.

OrderItem is a weak entity dependent on the order. There are one or more items in each order. Attributes of order items are name, quantity, and price. OrderItem is in total participation in this relationship.

Order items are contained in the products of the shop. Product id, name, unit price, and stock will be recorded in the database.

The primary keys and candidate keys of each entity are listed below. The ER diagram is shown in the picture.

table 1 Entities, primary keys, and candidate keys

Entity	Primary Key	Candidate Key
Customer	CustomerID	
Vip	VipID	Type, Points, Discounts
Orders	OrderID	
OrderItem	{OrderID, ItemName}	{OrderID, ProductID}
Product	ProductID	PName

Table: OFFLINE

FD: OderID → PayMethod

Meaning: OrderID can determine the payment method.

Table: ONLINE

FD: OrderID → Status

Meaning: OrderID can determine the status.

Table: OrderItem

FD: OrderID, ItemName → ProductID

Meaning: OrderID and ItemName determine the product ID.

5. Normalized schema

The schema above is normalized in 3NF because for all non-trivial dependencies in this schema, there is a superkey in the left-hand side or a prime attribute in the right-hand side.

6. SQL dump

```
-- phpMyAdmin SQL Dump
-- version 5.1.1deb3+bionic1
-- https://www.phpmyadmin.net/
--
-- Host: localhost
-- Generation Time: Apr 16, 2022 at 01:56 PM
-- Server version: 8.0.27
-- PHP Version: 7.2.24-0ubuntu0.18.04.11

SET SQL_MODE = "NO_AUTO_VALUE_ON_ZERO";
START TRANSACTION;
SET time_zone = "+00:00";

/*!40101 SET @OLD_CHARACTER_SET_CLIENT=@@CHARACTER_SET_CLIENT */;
/*!40101 SET @OLD_CHARACTER_SET_RESULTS=@@CHARACTER_SET_RESULTS */;
/*!40101 SET @OLD_COLLATION_CONNECTION=@@COLLATION_CONNECTION */;
/*!40101 SET NAMES utf8mb4 */;

--
-- Database: `P2`
--

--
-- Table structure for table `Customer`
--

CREATE TABLE `Customer` (
  `CustomerID` int NOT NULL,
  `FirstName` char(20) NOT NULL,
  `LastName` char(20) NOT NULL,
  `Gender` char(20) NOT NULL,
  `DOB` date NOT NULL,
  `Phone` char(20) NOT NULL,
  `Address` char(100) CHARACTER SET utf8mb4 COLLATE utf8mb4_0900_ai_ci NOT NULL,
  `Points` int NOT NULL,
  `VipType` char(20) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;

--
-- Dumping data for table `Customer`
--

INSERT INTO `Customer` (`CustomerID`, `FirstName`, `LastName`, `Gender`, `DOB`, `Phone`, `Address`, `Points`,
```

```
`VipType`) VALUES
(1, 'Luo', 'Valley', 'female', '1983-04-18', '(04) 9126 4896', '10 Insignia Way BOULDER Western Australia 6432', 3654, 'Gold'),
(2, 'Jonathan', 'Tincob', 'Male', '1971-06-08', '(04) 3909 9880', '128 Henry Street GEELONG Victoria 3220', 2547, 'Silver'),
(3, 'Elena', 'Udrea', 'female', '1970-07-11', '(04) 4033 4041', '57 Mackie Street NOWRA New South Wales 2541', 1239, 'Bronze'),
(4, 'Olivia', 'Abe', 'female', '1996-01-28', '(04) 6101 7194', '99 Quayside Vista CANBERRA Australian Capital Territory 2601', 6698, 'Platinum'),
(5, 'Renata', 'Lucia', 'female', '1990-03-11', '(04) 4040 1276', '36 Sydney Road MURRAGAMBA New South Wales 2850', 3586, 'Gold'),
(6, 'Martin', 'Wat', 'male', '1994-04-06', '(04) 8361 1395', '22 High Street POINT SOUTTAR South Australia 5575', 4216, 'Diamond'),
(7, 'Harry', 'Crofts', 'male', '1964-05-26', '(04) 9067 5399', '47 Baker Street KRONKUP Western Australia 6330', 2658, 'Silver'),
(8, 'Jamie', 'Carllyle', 'female', '1976-01-13', '(04) 5344 5524', '99 Crofts Road NOWA Victoria 3887', 1200, 'Bronze'),
(9, 'Mike', 'House', 'male', '1991-03-21', '(04) 4290 4708', '87 Jacobina Court WOLLONGONG NORTH New South Wales 2500', 726, 'Bronze'),
(10, 'Lydia', 'Daisy', 'female', '1987-12-08', '(04) 3512 1440', '71 Delan Road SKYRING RESERVE Queensland 4671', 3954, 'Gold');
```

```
-- -----
```

```
--
-- Table structure for table `Offline`
--
```

```
CREATE TABLE `Offline` (
  `OrderID` int NOT NULL,
  `PayMethod` char(20) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;
```

```
--
-- Dumping data for table `Offline`
--
```

```
INSERT INTO `Offline` (`OrderID`, `PayMethod`) VALUES
(1, 'Card'),
(2, 'Cash'),
(4, 'Card'),
(5, 'Card'),
(8, 'Cash');
```

```
-- -----
```

```
--
-- Table structure for table `Online`
--
```

```
CREATE TABLE `Online` (
  `OrderID` int NOT NULL,
  `Status` char(20) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;
```

```
--
-- Dumping data for table `Online`
--
```

```
INSERT INTO `Online` (`OrderID`, `Status`) VALUES
(3, 'Delivered'),
(6, 'Delivered'),
(7, 'Not Shipped');
```

```
-- -----
```

```
--
-- Table structure for table `OrderItem`
```

```

--

CREATE TABLE `OrderItem` (
  `OrderID` int NOT NULL,
  `ItemName` char(20) NOT NULL,
  `Quantity` float NOT NULL,
  `Price` float NOT NULL,
  `ProductID` int NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;

--
-- Dumping data for table `OrderItem`
--

INSERT INTO `OrderItem` (`OrderID`, `ItemName`, `Quantity`, `Price`, `ProductID`) VALUES
(1, 'Yoghurt', 2, 8, 5),
(2, 'Shampoo', 1, 11, 7),
(3, 'Carrot', 2, 4, 1),
(3, 'Patato', 1, 2, 4),
(4, 'Butter', 1, 6, 6),
(5, 'Strauberry', 2, 31.2, 3),
(6, 'Yoghurt', 2, 8, 5),
(7, 'Tomato', 2, 27.6, 2),
(8, 'Shampoo', 1, 11, 7),
(8, 'Strawberry', 1, 15.6, 3);

-----

--
-- Table structure for table `Orders`
--

CREATE TABLE `Orders` (
  `OrderID` int NOT NULL,
  `Date` date NOT NULL,
  `Amounts` float NOT NULL,
  `OrderType` char(20) NOT NULL,
  `AddedPoints` int NOT NULL,
  `CustomerID` int NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;

--
-- Dumping data for table `Orders`
--

INSERT INTO `Orders` (`OrderID`, `Date`, `Amounts`, `OrderType`, `AddedPoints`, `CustomerID`) VALUES
(1, '2021-11-02', 8, 'Offline', 8, 3),
(2, '2021-12-28', 11, 'Offline', 11, 1),
(3, '2022-01-02', 6, 'Online', 6, 9),
(4, '2022-02-18', 6, 'Offline', 6, 4),
(5, '2022-03-16', 31.2, 'Offline', 31, 10),
(6, '2022-03-25', 8, 'Online', 8, 2),
(7, '2022-04-04', 2, 'Online', 2, 3),
(8, '2022-04-13', 26.6, 'Offline', 26, 5);

-----

--
-- Table structure for table `Product`
--

CREATE TABLE `Product` (
  `ProductID` int NOT NULL,
  `PName` char(20) NOT NULL,
  `UnitPrice` float NOT NULL,
  `Stock` float NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;

```

```

--
-- Dumping data for table `Product`
--

INSERT INTO `Product` (`ProductID`, `PName`, `UnitPrice`, `Stock`) VALUES
(1, 'Carrot', 2, 4.7),
(2, 'Tomato', 13.8, 16.1),
(3, 'Strawberry', 15.6, 13.7),
(4, 'Patato', 2, 6.7),
(5, 'Yoghurt', 4, 26),
(6, 'Butter', 6, 15),
(7, 'Shampoo', 11, 3),
(8, 'Banana', 3.2, 12);

-----

--
-- Table structure for table `VIP`
--

CREATE TABLE `VIP` (
  `VipID` int NOT NULL,
  `VipType` char(20) DEFAULT NULL,
  `Points` char(20) DEFAULT NULL,
  `Discounts` char(20) DEFAULT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;

--
-- Dumping data for table `VIP`
--

INSERT INTO `VIP` (`VipID`, `VipType`, `Points`, `Discounts`) VALUES
(1, 'Bronze', '<2000', '1'),
(2, 'Silver', '2000-3000', '0.95'),
(3, 'Gold', '3000-4000', '0.9'),
(4, 'Diamond', '4000-5000', '0.85'),
(5, 'Platinum', '>5000', '0.8');

--
-- Indexes for dumped tables
--

--
-- Indexes for table `Customer`
--
ALTER TABLE `Customer`
  ADD PRIMARY KEY (`CustomerID`);

--
-- Indexes for table `Offline`
--
ALTER TABLE `Offline`
  ADD PRIMARY KEY (`OrderID`);

--
-- Indexes for table `Online`
--
ALTER TABLE `Online`
  ADD PRIMARY KEY (`OrderID`);

--
-- Indexes for table `OrderItem`
--
ALTER TABLE `OrderItem`
  ADD PRIMARY KEY (`OrderID`, `ItemName`);

```

```
--
-- Indexes for table `Orders`
--
ALTER TABLE `Orders`
  ADD PRIMARY KEY (`OrderID`);

--
-- Indexes for table `Product`
--
ALTER TABLE `Product`
  ADD PRIMARY KEY (`ProductID`);

--
-- Indexes for table `VIP`
--
ALTER TABLE `VIP`
  ADD PRIMARY KEY (`VipID`);
COMMIT;

/*!40101 SET CHARACTER_SET_CLIENT=@OLD_CHARACTER_SET_CLIENT*/;
/*!40101 SET CHARACTER_SET_RESULTS=@OLD_CHARACTER_SET_RESULTS*/;
/*!40101 SET COLLATION_CONNECTION=@OLD_COLLATION_CONNECTION*/;
```

7. Screenshot

- 1) Select everything from table 'Orders', so that users can get all the orders they have.

```
SELECT* FROM Orders;
```

[\[Edit inline \]](#) [\[Edit \]](#) [\[Create PHP code \]](#)

Show all
Number of rows: 25

+ Options

					OrderID	Date	Amounts	OrderType	AddedPoints	CustomerID
<input type="checkbox"/>	Edit	Copy	Delete		1	2021-11-02	8	Offline	8	3
<input type="checkbox"/>	Edit	Copy	Delete		2	2021-12-28	11	Offline	11	1
<input type="checkbox"/>	Edit	Copy	Delete		3	2022-01-02	6	Online	6	9
<input type="checkbox"/>	Edit	Copy	Delete		4	2022-02-18	6	Offline	6	4
<input type="checkbox"/>	Edit	Copy	Delete		5	2022-03-16	31.2	Offline	31	10
<input type="checkbox"/>	Edit	Copy	Delete		6	2022-03-25	8	Online	8	2
<input type="checkbox"/>	Edit	Copy	Delete		7	2022-04-04	2	Online	2	3
<input type="checkbox"/>	Edit	Copy	Delete		8	2022-04-13	26.6	Offline	26	5

2) Add a new product in table 'Product'.

```
INSERT INTO Product VALUES (8, 'Banana', 3.2, 12);
```

ProductID	PName	UnitPrice	Stock
1	Carrot	2	4.7
2	Tomato	13.8	16.1
3	Strawberry	15.6	13.7
4	Patato	2	6.7
5	Yoghurt	4	26
6	Butter	6	15
7	Shampoo	11	3
8	Banana	3.2	12