Assignment 1 - Order Management System

Maria Svetlana is planning to launch her online shop. One task she should do in the preparation stage is to build a software that will help to manage her business operations accurately and effectively. Unfortunately, she knows nothing about programming languages. As a startup with a limited budget, she can't spend a lot of money to hire a professional software company. After reading this far, you, a chivalrous guy, are happy to help her without any fee. Below is the detailed description of this software, hereinafter called OMS, given by Maria.

1. The main goal of the OMS is to manage the information about products and orders. This information must be stored permanently in the text files. The interaction between users and the OMS should be done through keyboard shortcuts.
2. The OMS allows to add, update, and delete products. Product properties include
   (a) Product Id: a string of 6 characters starting with 3 capital letters followed by 3 digits. The value of this field must be unique for all products since it is used to uniquely identify a product.
   (b) Product name: a string with a maximum length of 100 characters, starting with a letter and containing no special symbols such as $\alpha, \%, !, ..$
   (c) Product price: an integer number
3. The OMS needs to manage the order information, including
   (a) Order Id: an unique string of 14 digits. The first 8 digits indicate the order date and the 6 remaining digits are the time when the order was made. For example, 04092021170258 means that the order was made on 04/09/2021 at 17:02:58.
   (b) Customer name: a string with a maximum length of 50 characters
   (c) Customer phone: a string of 10 or 11 digits
   (d) Shipping address: a string with a maximum length of 200 characters
   (e) Order state: the binary state of an order indicating if the order is shipped
   (f) List of products and their quantities (The Product Id should be used instead of Product name)
   (g) Discount: an integer indicating the whole order discount
   (h) Total price: the final price of the order. This is calculated automatically by the following formula

$$\sum_{i=1}^{n}(\texttt{Product price}_i \times \texttt{Product quantity}_i) - \texttt{Discount}$$

   here, n is number of products in the given order.
4. Besides managing products and orders, Maria wants to add the following query functions
   (a) List all products in alphabetical order from 'A' to 'Z'
   (b) List all orders in a given month
   (c) Show the detail of an order given its Id
   (d) Sort and display all products in ascending order of price
   (e) Calculate number of products sold in month, group by each product
   (f) Find top 5 best-selling products in a specific period.
5. In addition to the features mentioned above, feel free to add others if you like.

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