1. Analyze the requirements of the organization

(1) 用户管理

·支持用户注册、登录账号，填写、修改个人信息

·用户可以浏览、搜索并查看商品信息

·用户可以在下单时选择商品创建订单

·用户可以查看订单详情和物流状态

·用户可以对已购买的商品进行评价

·用户可以查看历史订单和历史评价

(2) 商品管理

·每个商品需包含相关信息

·支持商品分类查找、条件筛选、关键词搜索功能

(3) 供应商管理

·供应商可以注册账号，并填写商户信息

·供应商可以添加、修改、删除商品信息

·供应商可以处理订单是否发货以及售后

·供应商可以查看商品销量和用户评价，进行销售数据分析

(4) 订单管理

·订单中需包含相关信息

·支持订单状态跟踪（是否付款与是否发货）

·成交订单将计入商品销量

Addition

1.(1) 去掉购物车 直接下单商品

1.(4) 用户个人信息中的地址是所在地 订单中的地址是收货地址

1.(5) 为了控制系统复杂度 不单独将评价设置为实体 改成将评价作为商品属性（虽然查找起来会复杂点）

2. Identify the relevant entities, attributes, and relationships together with any constraints and properties

(1) Customer

customer\_id (PK, unique)

username (unique)

password

gender (check)

age (check)

customer\_phone\_number (unique)

address

registration\_date (default)

(2) Product

product\_id (PK)

product\_name

image\_url

description

category (check)

price (check)

total\_sales (default)

stock\_quantity (check)

average\_rating (check)

supplier\_id (FK)

(3) Supplier

supplier\_id (PK)

supplier\_name (unique)

contact\_name

supplier\_phone\_number

business\_address

registration\_date (default)

(4) Order

order\_id (PK)

customer\_id (FK)

order\_date (default)

total\_amount (check)

status(payment\_status, delivery\_status)

shipping\_address

(5) Order\_Item

order\_id (PK, FK)

product\_id (PK, FK)

supplier\_id (FK)

quantity (check)

unit\_price (check)

(6) relationship

Customer - Order: 一对多

Order - Order\_Item: 一对多

Order - Product: 多对多（通过Order\_Item实现）

Supplier - Product: 一对多（如果要改成允许多个供应商供货同一件商品，再建一个中间表，移除product表的supplier\_id）

Addition

2.(4) status也可以分成两个Attributes

2.(4) 配送地址可以重新做一个地址表避免用户有多个地址或者临时地址（也可以直接设置只允许有一个地址）

3. Produce an E-R diagram for the database

4. Convert the E-R diagrams to relational schemas (clearly indicating the primary keys, foreign keys, functional and/or multivalued dependencies, as well as justifying that your designs are in good, normalized form)

8. Suggest which data fields of the relational schemas should be indexed or hashed, and explain your decision

(1) Customer

customer\_id (Hash)

username (Index)

customer\_phone\_number (Index)

registration\_date (Index)

(2) Product

product\_id (Hash)

product\_name (Index)

category (Index)

price (Index)

average\_rating (Index)

(3) Supplier

supplier\_id (Hash)

supplier\_name (Index)

registration\_date (Index)

(4) Order

order\_id (Hash)

customer\_id (Index)

order\_date (Index)

status(payment\_status, delivery\_status) (Index)

(5) Order\_Item

order\_id (Index)

product\_id (Index)

supplier\_id (Index)