

Exercise 1

Let us consider a gas station.

Customers serve themselves with fuel, and the attendant refills the pump reservoirs.

- 1- The customer serves himself with fuel in the following way: He takes a nozzle attached to a pump and pulls the trigger to get fuel. Question: Who is the actor in the system — the customer, the nozzle, the pump, the fuel, or the trigger?
- 2- Jojo, whose job is a station attendant, wants to get fuel for his own car. To model this activity of Jojo, should we define a new actor? Draw the corresponding use case diagram.
- 3- When Jojo comes with his tanker truck to fill the pump reservoirs, is he considered a new actor? Enrich the previous use case diagram accordingly.
- 4- Among the attendants, some are also qualified to perform maintenance operations in addition to the usual tasks of attendants, such as filling the pump reservoirs. They remain attendants but are called technicians. Further enrich the use case diagram

Exercise 2

Let us consider the following use cases:

“Order Shipping”, “Complete Shipping”, “Partial Shipping”, “Order Management”, “Place Order”, “Place Urgent Order”, “User Identification”.

The “Order Management” process represents the entire workflow, from placing the order to shipping it. However, it is possible that an order that has been placed is not shipped. Placing an urgent order is a special case of placing an order. To place an order, the user must first be validated (identified).

Propose a use case diagram showing the relationships between the use cases, without representing the actors.

Exercise 3

An ATM (Automated Teller Machine) allows clients to access their bank accounts to: Withdraw cash, or Check their account balance. A maintenance technician is responsible for periodically refilling the machine with banknote (cash).

Identify and describe the use cases of the system.

Exercise 4

We want to design a cash register system. The use of the cash register is described as follows:

1. A customer arrives at the checkout with items.
2. The cashier records the identification number of each item, as well as the quantity if it is greater than 1.
3. When all items have been entered, the cashier indicates the end of the sale.
4. The customer chooses a payment method:
 - Cash: the cashier collects the money, and the register shows any change to return.
 - Check: the cashier records the customer's identity and enters the amount on the check.
 - Credit card: a banking terminal integrated with the register sends an authorization request to a multi-bank authorization center.
5. The register records the sale and prints a receipt.
6. The cashier gives the receipt to the customer.
7. A customer may present discount coupons before payment.
8. When the payment is completed, the register sends sales information to the inventory management system.
9. Every morning, the store manager initializes the registers for the day.

Propose a use case diagram to model the expected functionalities of the cash register system.

Exercise 5

In an educational institution, it is desired to manage the reservation of classrooms as well as teaching equipment (laptop and/or video projector). Only teachers are authorized to make reservations (subject to the availability of the room or equipment). The schedule of classrooms, however, can be viewed by everyone (both teachers and students). On the other hand, the individual timetable summary for each teacher (calculated from the classroom schedule) can only be viewed by teachers. Finally, for each training program, there is a responsible teacher who alone can edit the timetable summary for the entire program.

Task:

Draw the corresponding use case diagram