

Getting Ready: Vending Machine

Understand the vending machine problem and learn the questions to further simplify this problem.

We'll cover the following

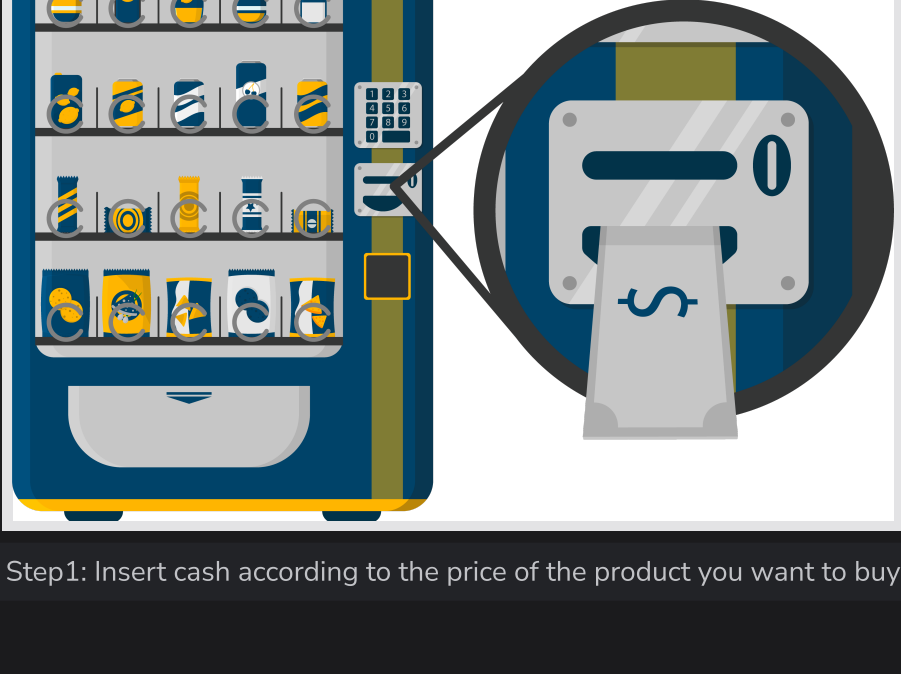
- Problem definition
- Expectations from the interviewee
 - States of the vending machine
- Money handling
- Design approach
- Design pattern

Problem definition

A **vending machine** is an automated machine. The machine provides items, including snacks, chocolates, and beverages to consumers. There are multiple racks inside the vending machine with products on each rack. A user inserts money into the machine, selects the rack number from which they want to buy a product, and presses the button. A vending machine dispenses the product to the users based on the amount of money inserted and the selection of the product.


Modern vending machines were first developed in England in the early 1880s and dispensed postcards. Today, there are specialized vending machines that provide specific products. The vending machine is a 24x7 standalone unit that requires a standard power supply connection to function. It consists of electromechanical systems that help automate the entire vending process. Therefore, its basic function is to flawlessly issue users with a diverse range of products.

The diagram below elaborates on the process of product purchasing using the vending machine:




Step1: Insert cash according to the price of the product you want to buy

1 of 5




Step2: Select a product you want to buy

2 of 5



Step3: Insert the code of the product you want to buy

3 of 5



Step4: If the amount inserted is greater than the price of the product you purchased, then the balance amount will be returned

4 of 5



Step5: The purchase product will be dispensed to the container

5 of 5

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Expectations from the interviewee

Although the vending machine problem is a simpler design problem asked in interviews, the interviewer still has some expectations. The following provides an overview of what the interviewer wants to hear you discuss in more detail during the interview.

States of the vending machine

An interviewer would also expect you to discuss the different states of the vending machine. You may ask the following set of questions:

- What function do the vending machines perform? Alternatively, how many different states can the vending machines have?
- After inserting money into the machine, what does the system do?
- Who presses the vending machine button, and what happens after pressing it?
- What does the dispense function do?
- If the vending machine is in a dispense state, is it possible to insert money?
- If you are in `NoMoneyInsertedState` and try to select a product without paying money, would you be able to select a product?

Money handling

One of the most significant attributes of the vending machine system is how it receives, calculates, and returns money. You may ask the interviewer the questions listed below:

- What should the system do if we pay less money than the product price?
- What should the system do if we pay more money than the product price?
- Can the credit card be used to input money or can only cash be used?

Design approach

We'll design this vending machine problem using the bottom-up design approach. For this purpose, we'll follow the steps below:

- Identify and design the smallest components first, like, a product in the machine.
- Use these small components to design bigger components, for example, the inventory.
- Repeat the steps above until we design the whole system, which is the vending machine.

Design pattern

During an interview, it is always a good practice to discuss the design patterns that a vending machine falls under. Stating the design patterns gives the interviewer a positive impression and shows that the interviewee is well-versed in the advanced concepts of object-oriented design.

i Try to answer the following question. If you are not familiar with design patterns, don't worry! You can learn about them by asking questions like, "Define design patterns."