

Practical Object oriented design (Strategy & Iterator)

Solve the following problems.

Problem1: Virtual Shopping Cart

Design a virtual shopping cart system of E-commerce application in which users can add and remove items from their carts. When it's time to check out, the cart computes the total of all items in the cart. Of course the total also includes the sales tax and shipping costs. These costs depend on where the customer lives and which shipping method he selected: air, land, or sea.

Problem2: Photo Sharing

Instagram is a free photo sharing program and social network that was launched in 2010 and had a tremendous success since then. The principle of Instagram is quite simple: the app allow you to take a picture, apply a digital filter to it, and then share it with other Instagram users or upload the picture to your favorite social networking service. The picture below illustrates how different filters can be applied to a picture taken with a mobile phone.

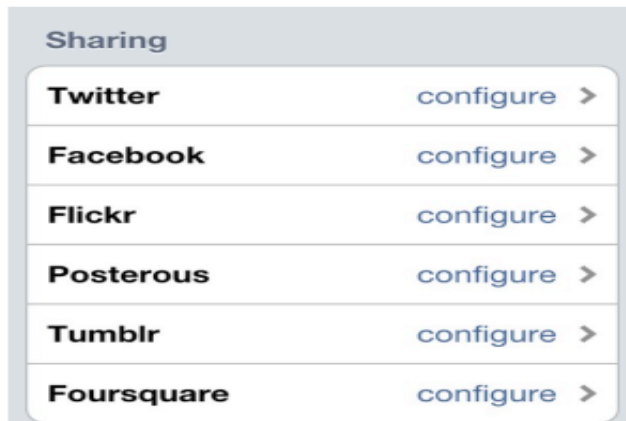


You snap a picture then choose a filter from the bottom of your screen: you can scroll left and right to see different filters. Once you apply a filter on the picture the picture will change its visual appearance.

- Assuming only one filter can be applied on an image, how you would implement the filter functionality in Instagram? Which design pattern shall we use to make the application of different filters on the picture possible in the app? Provide the implementation.
- How would you implement the filter functionality if more than one filter can be applied on an image?

Once you have taken a picture and applied a filter on it you have also the option to share it on your favorite social network. The user interface below illustrates this:

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You can click any of the social networks from the list presented in the “Sharing” window of the application that you want to post your photo on. Enter the username and password associated with your account to link it with your Instagram account. Your photo will appear in your “Feed” and also the feed of other Instagram users that are following you. It will also be posted to any of the social networks you selected.

- c) How you would implement this functionality? Which design pattern would you use for sharing your Instagram picture with your favourite social network?

Problem3: Car iterator

As part of this problem, we have to maintain car collection and we want to be able to iterate through our collection of cars. The implemented collection can simply add some cars for the moment. For each car, keep track of the brand, model, color, year, mileage, price and availability. We would like to be able to iterate through the collection in terms of brand, mileage, price, year and the whole collection. Design an application that allows us to traverse the car collection in an uniform way for a given iterable attribute name and value combination.