**Used Design patterns:**

1. Abstract factory for (Service, Form, Handler):

We used the abstract factory pattern since its purpose is to create a family of different related objects, therefore we used it to create the needed service with its form and handler because they are different objects which are related to each other

**Note**: we made the factories to model the different types of services (Internet Factory, Mobile Factory, ….). we thought about making a factory for each specific service provider type.

For Example a factory for Vodafone mobile service and another for Orange mobile service.

But we found this design to be very explosive because we would have to add 3 new classes for each specific factory which brought the total of factory-related classes to nearly 40 classes.

We also took into consideration that type-related services nearly have the same handler and form, so we made abstract factories for the type of the services, if a new service was added it would go under one of them or a new factory type will be created, this also allows us to make service-specific forms in the future if wanted (in case its form was different from others under the same type)

1. Factory method for (transaction controller):

We used the factory method in the transaction controller and its children because it allows subclasses to alter the type of objects made, so we made it to override only certain parts of the creation algorithm to make different types of transaction controllers to handle different types of transactions (payment, refund, wallet).

So they override the makeTransaction ( ) , and createTransaction( ) functions but leave the rest of the processes the same as their parent.

**Note:** since the factory method is a specialization of template method, therefore this could be considered a template but since the goal of these controllers is to create different types of transactions, so we saw that it would be more fit for it to be a factory method due to its creation function

1. Strategy pattern:

**Note:** asdasdf

1. Decorator pattern for (Discount):

We chose the decorator pattern to implement and model the discount.

Since either a service or a user has discounts on them added by the admin.

So we made added discount to wrap the existing discount on either of them .

taking into consideration that users and services are initialized with a discount of 0 amount $.

So we

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