Design Of Pen

Contents

Code and Notes are @ https://github.com/nishithjain/Design_Pen

1. Design a Pen

Overview

- What classifies as a Pen? Are we designing digital pen or normal pen?
    - Anything that can write on paper is a Pen.

Step 1: Gather the Requirements

- What type of pen are we designing? Ball Point Pen, Fountain, Gel
- Some pen will have refill and some pen will not have refill.
- Fountain pen will directly have ink.
- Ink can be of different colors.
- Every pen will have brand, price.
- Some pens, we will be able to refill and for some pens we will not be able to refill.
- Refill has Nib, Fountain pen will directly have the Nib.
- Nib can be of different radius.
- Ink can be of different types. (Sparkel, fragrance, waterproof)

Step 2: Clarify Requirements

- Ask questions on behaviors/edge cases/future modification.

Step 3: Identify the nouns

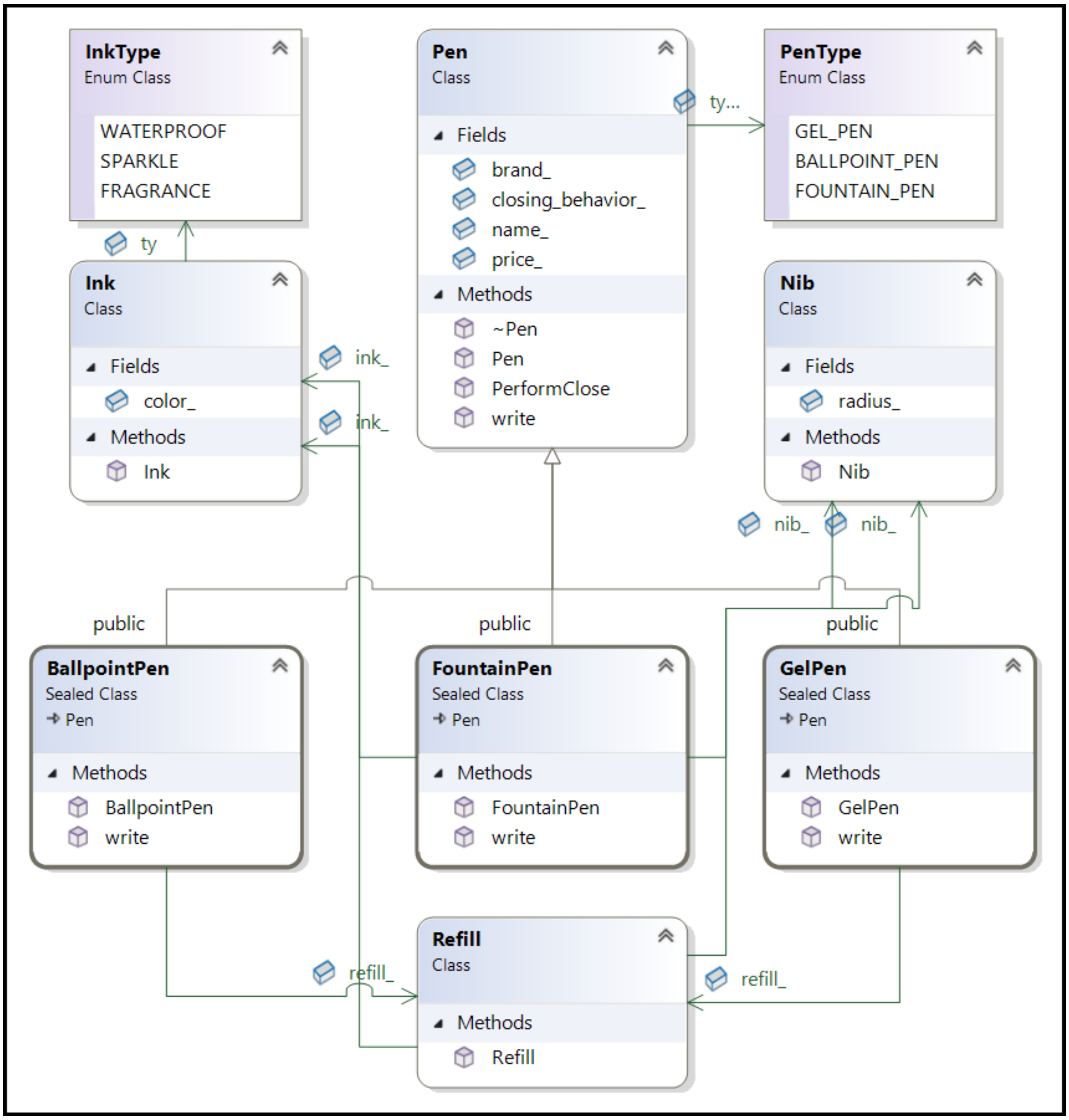
- Identify nouns in the requirement. 90% of the nouns in the requirement will be our classes.
- Nouns identified in the above requirements are
    - Pen
    - Ink
    - Nib
    - Refill
    - Color
    - Type (Ink, Nib, Pen)
    - Brand

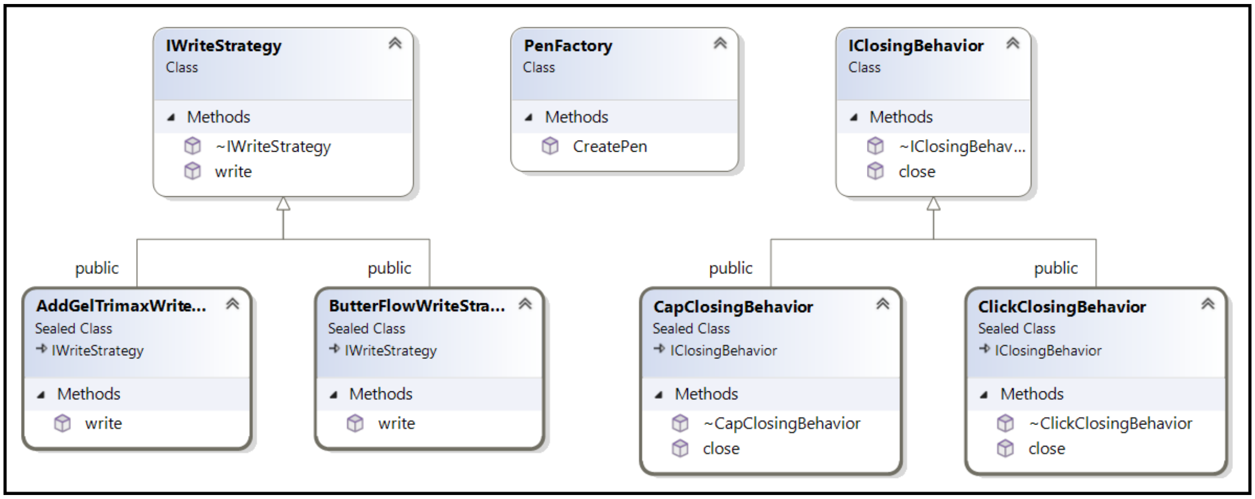
Step 4: Visualize Pen

- Visualize Pen and create classes from outside to inside.
- Often entities for which there are **multiple types** are there, these entities are defined as **abstract** class with a type attribute.
    - This type helps create factory.
- Pen is the out most part.
- Pen contains Refill. So, create a class for Refill next.
- Refill contains Nib. So, create a class for Nib.
- Refill contains Ink. So, create a class for Ink.

Step 5: Create a class diagram

- Expectation is to show classes for core entities in the system.
- No need to mention controller classes, services, repositories.
- We need to mention use of design patterns.
- Write() -> Pens can write in different ways.
    - Multiple ways to implement write() -> Strategy Design Pattern
- Based on input, create an object of the Pen -> Factory Design Pattern.




IWriteStrategy
Class
Methods
~IWriteStrategy
write
PenFactory
Class
Methods
CreatePen
IClosingBehavior
Class
Methods
~IClosingBehav...
close
public
public
public
public
AddGelTrimaxWrite...
Sealed Class
IWriteStrategy
Methods
write
ButterFlowWriteStra...
Sealed Class
IWriteStrategy
Methods
write
CapClosingBehavior
Sealed Class
IClosingBehavior
Methods
~CapClosingBehavior
close
ClickClosingBehavior
Sealed Class
IClosingBehavior
Methods
~ClickClosingBehavior
close