

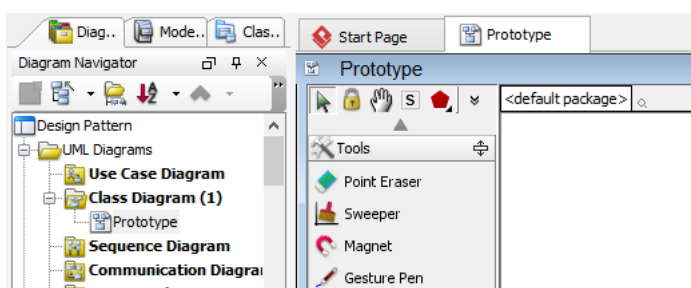


Prototype Pattern Tutorial

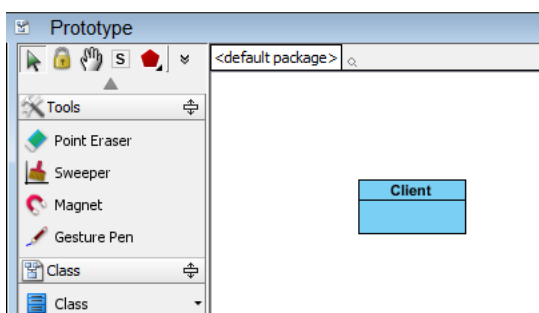
Written Date : September 30, 2009

Modeling a Design Pattern with a Class Diagram

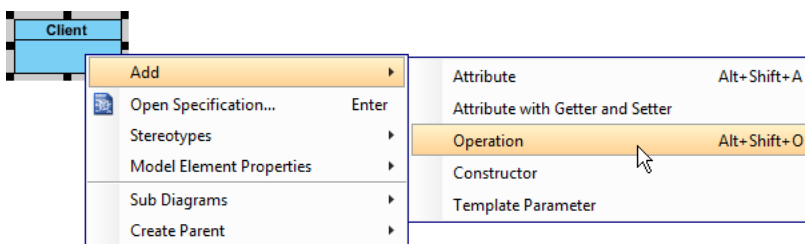
1. Create a new project named *Design Pattern*.
2. Create a class diagram named *Prototype*.



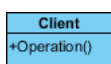
3. Select **Class** from the diagram toolbar. Click on the diagram to create a class. Name it *Client*.



4. Right-click on the *Client* class and select **Add > Operation** from the popup menu.



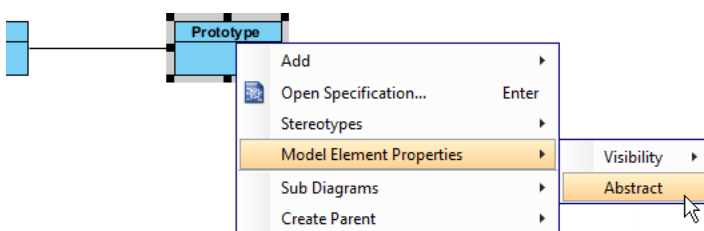
- Name the operation *Operation()*.



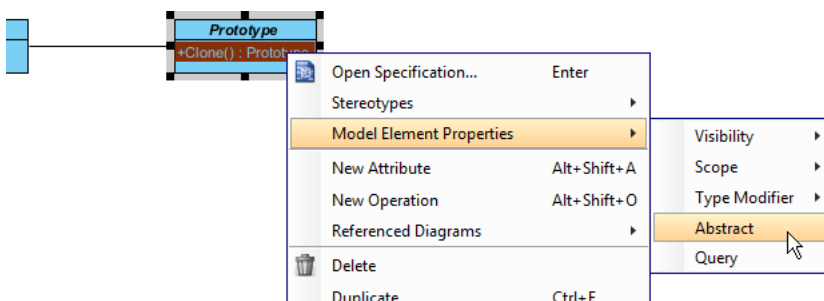
- Move the mouse cursor over the *Client* class and drag out **Association** > **Class** to create an associated class *Prototype*.



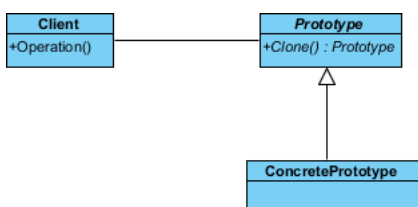
- Right-click on *Prototype* and select **Model Element Properties** > **Abstract** to set it as abstract.



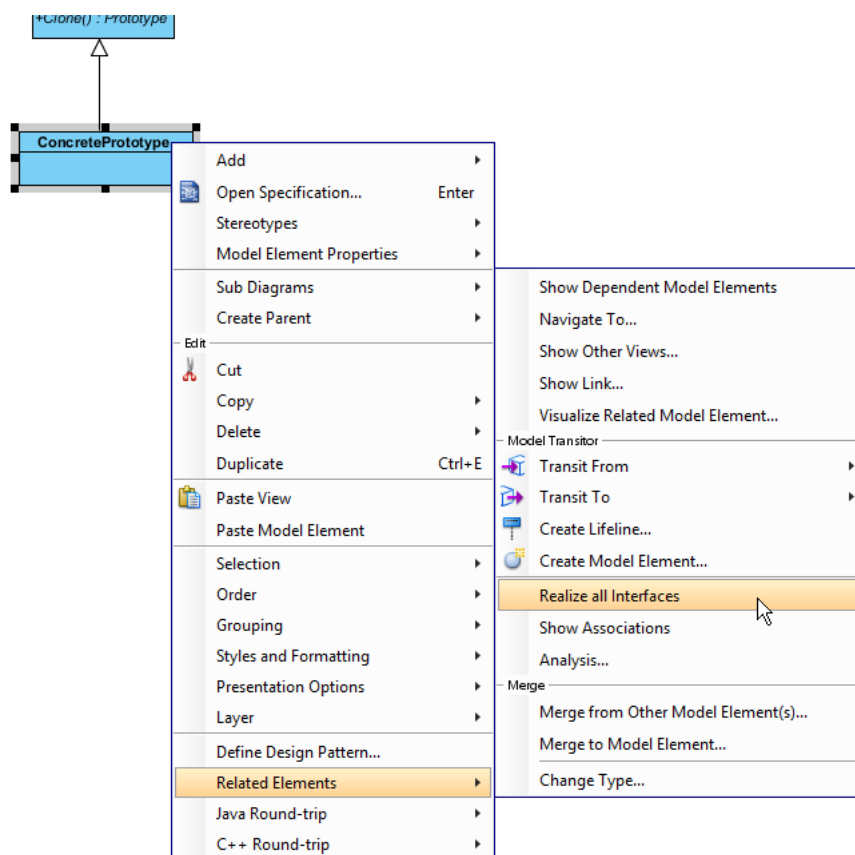
- Add an operation *Clone()* to *Prototype*. Make it return *Prototype*.
- Right-click on *Clone()* and select **Model Element Properties** > **Abstract** to set it as abstract.



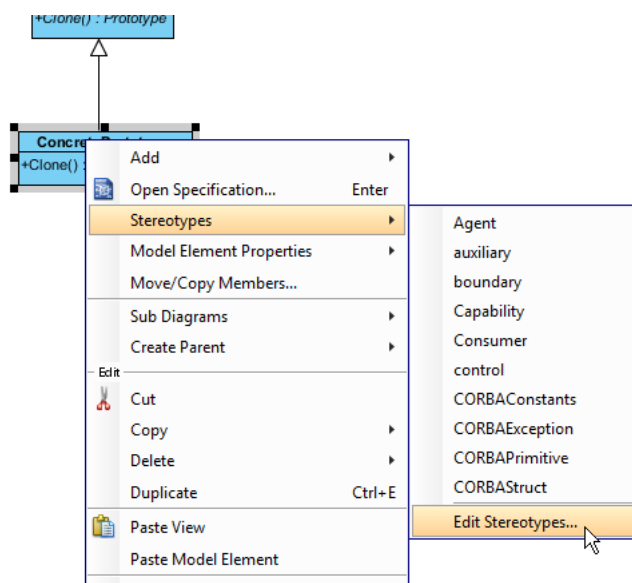
- Move the mouse cursor over the *Prototype* class and drag out **Generalization** > **Class** to create a subclass *ConcretePrototype*.



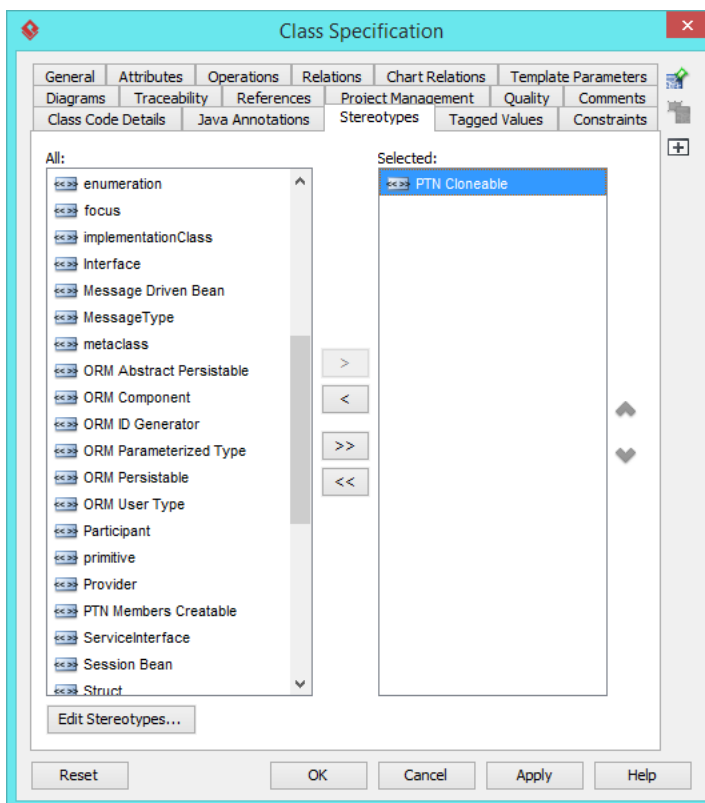
11. Make *ConcretePrototype* inherit the abstract operations provided from *Prototype* by right-clicking on *ConcretePrototype* and selecting **Related Elements > Realize all Interfaces** from the popup menu.



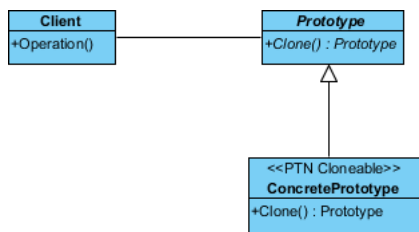
- In practice, there may be multiple *ConcretePrototype* classes. To represent this, stereotype the *ConcretePrototype* class as **PTN Cloneable**. Right-click on the *ConcretePrototype* class and select **Stereotypes > Stereotypes...** from the popup menu.



- In the **Stereotypes** tab of class specification, select **PTN Cloneable** and click > to assign it to the class. Click **OK** to confirm.

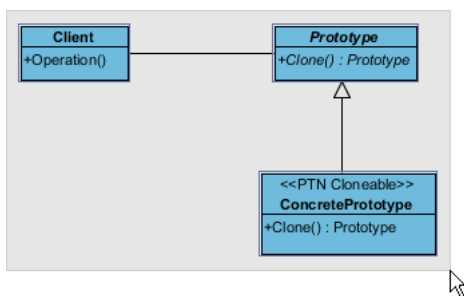


The diagram should look like this:

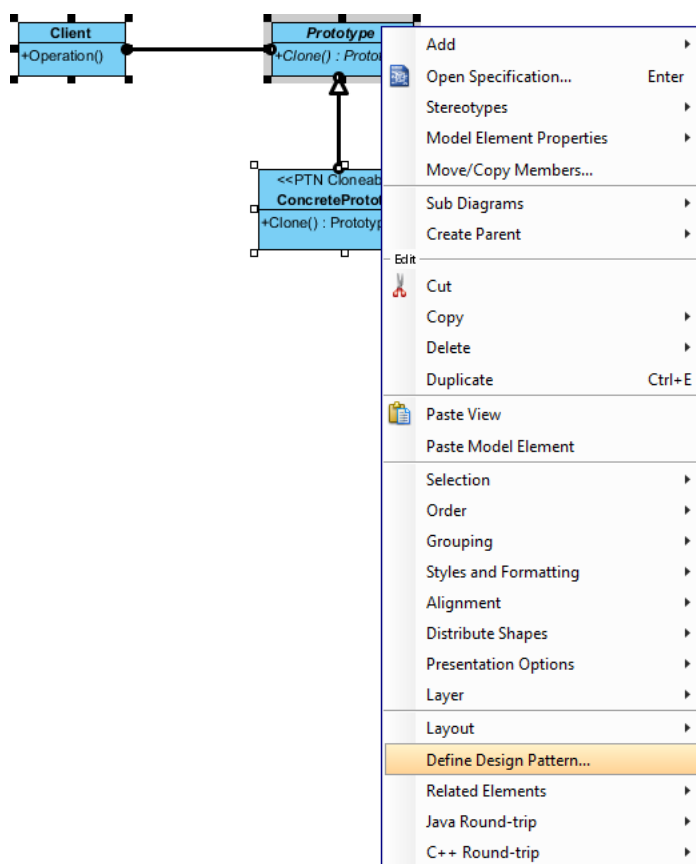


Defining a Pattern

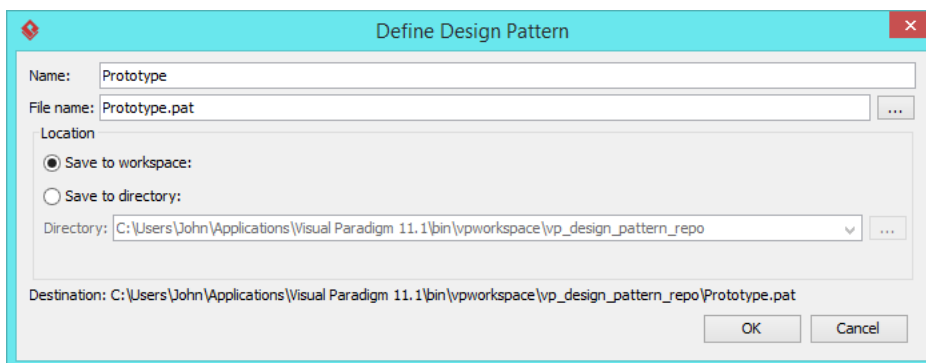
1. Select all classes on the class diagram.



2. Right-click on the selection and select **Define Design Pattern...** from the popup menu.



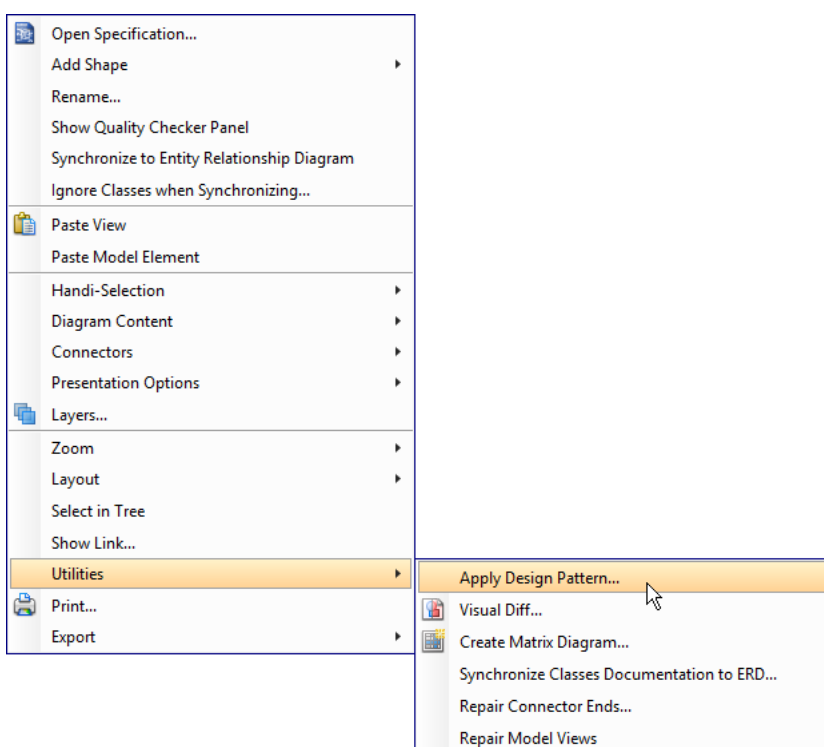
3. In the **Define Design Pattern** dialog box, specify the pattern name *Prototype*. Keep the file name as is. Click **OK** to proceed.



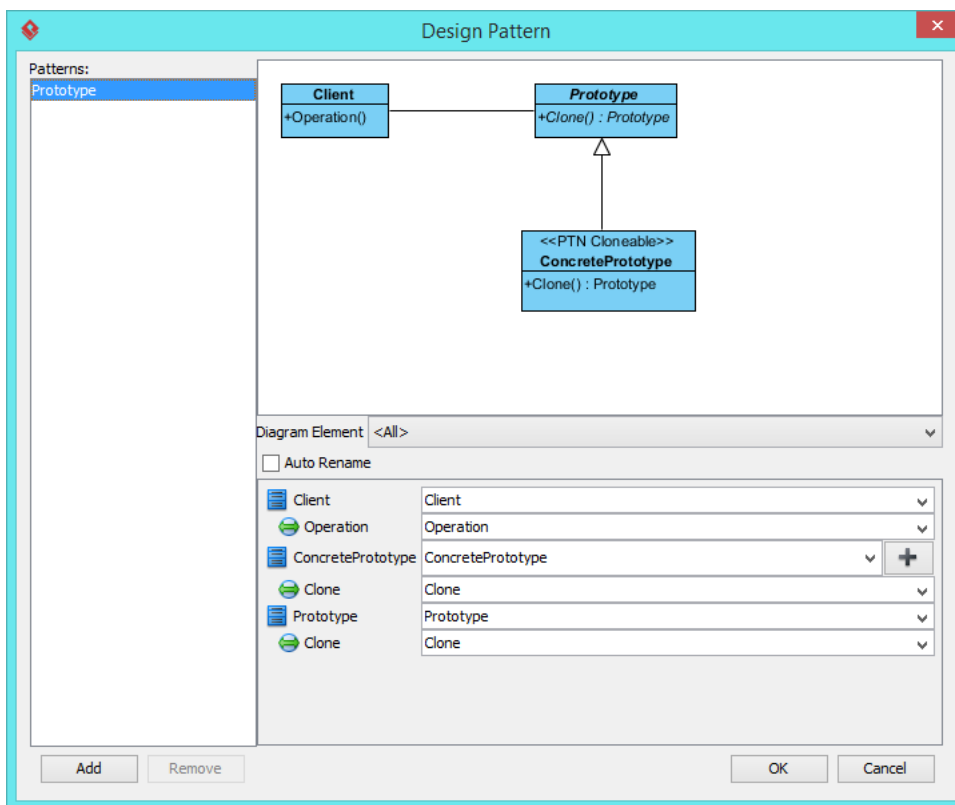
Applying a Design Pattern on a Class Diagram

In this section, we will try to make use of the prototype pattern to model a part of a diagram editor.

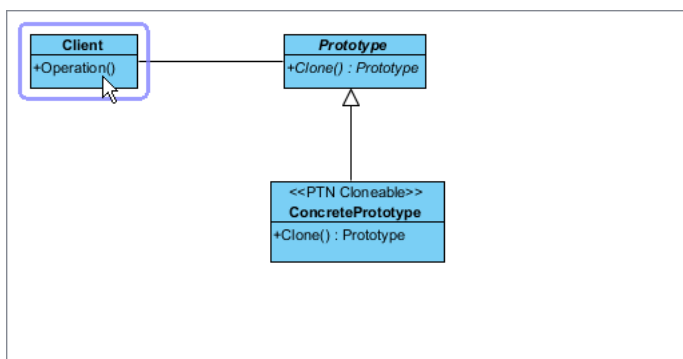
1. Create a new project *My Diagram Tool*.
2. Create a class diagram *Domain Model*.
3. Right-click on the class diagram and select **Utilities > Apply Design Pattern...** from the popup menu.



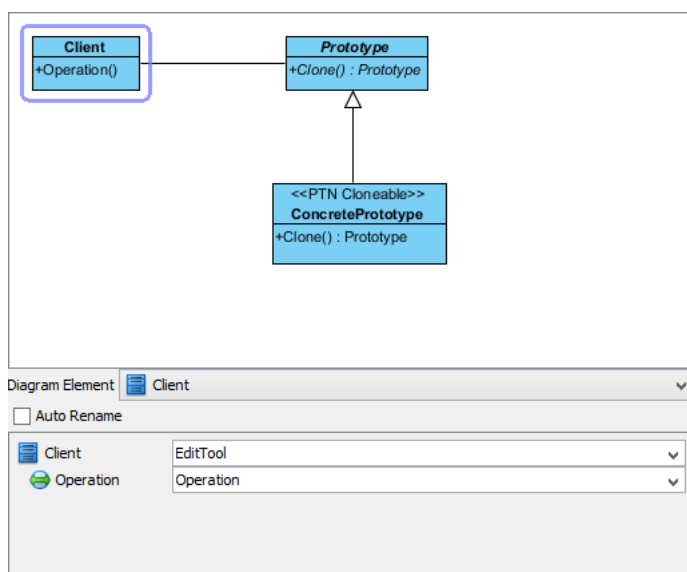
4. In the **Design Pattern** dialog box, select *Prototype* from the list of patterns.



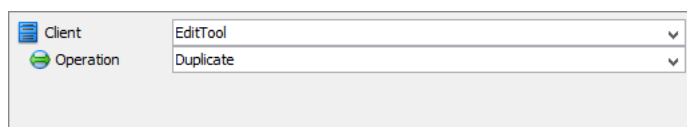
5. Click on *Client* in the overview.



6. Rename it to *EditTool* at the bottom pane.

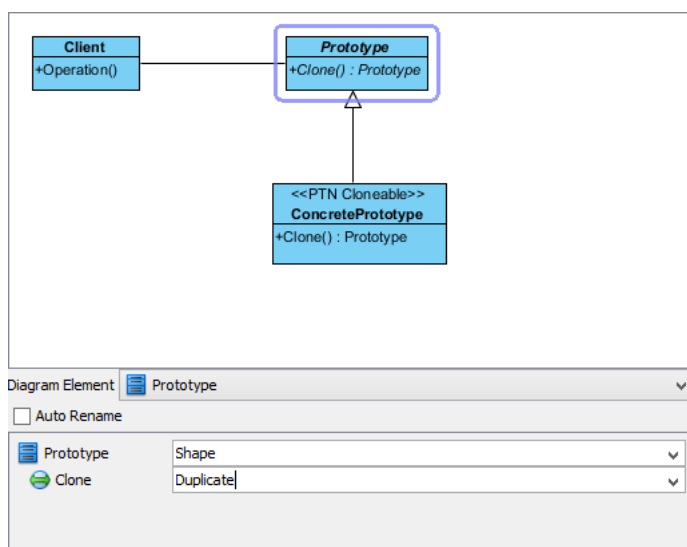


7. Rename *Operation* to *Duplicate*.



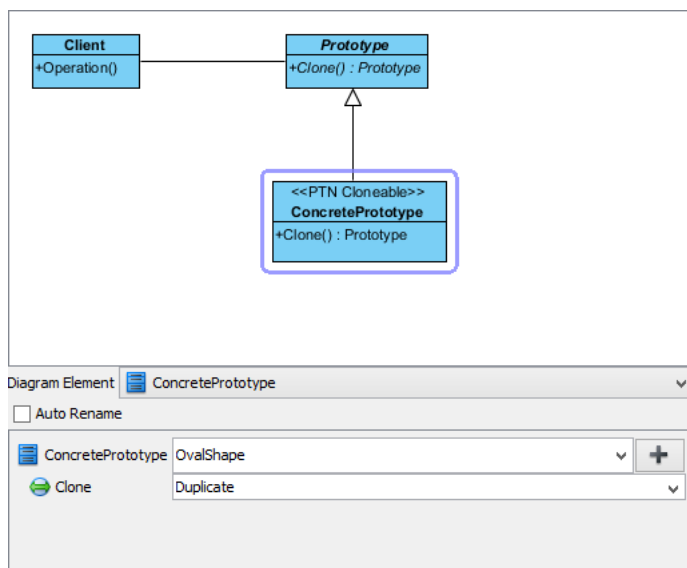
8. Select *Prototype* in the overview.

9. Rename *Prototype* to *Shape* at the bottom pane, and rename the operation *Clone* to *Duplicate*.

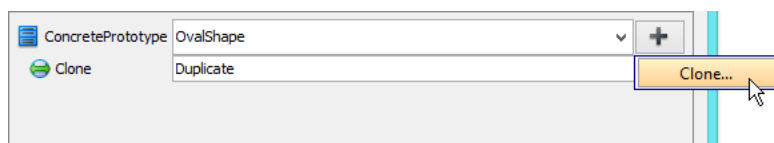


10. Select *ConcretePrototype* in the overview.

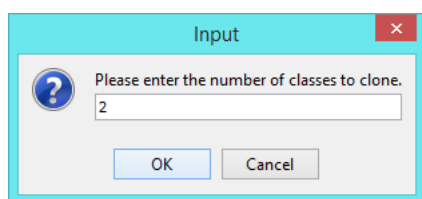
11. Rename *ConcretePrototype* to *OvalShape* at the bottom pane, and rename the operation *Clone* to *duplicate*.



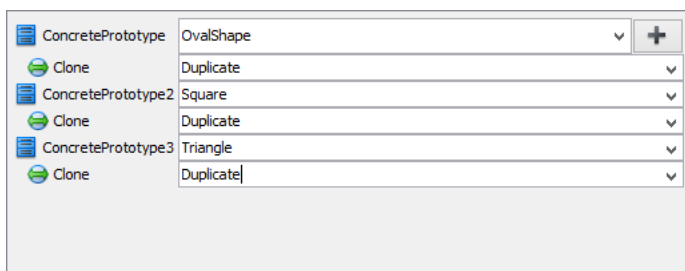
12. We need to have two more concrete prototype classes for square and triangle. Keep *ConcretePrototype* selected, click the **+** button, and select **Clone...** from the popup menu.



13. Enter 2 to be the number of classes to clone.

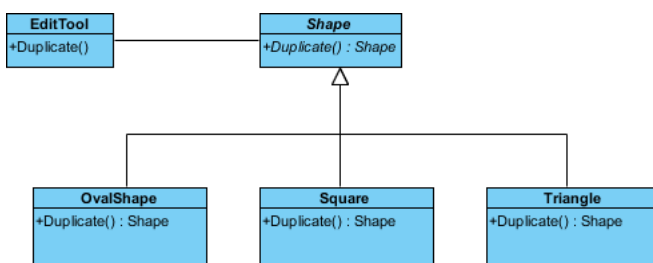


- Rename *ConcretePrototype2* and *ConcretePrototype3* to *Square* and *Triangle*, respectively. Rename the two *Clone* operations to duplicate.



- Click **OK** to confirm editing and apply the pattern to the diagram.

- Tidy up the diagram. It should become:



Resources

- [Design Patterns.vpp](#)
- [Prototype.pat](#)

Related Links

- [Full set of UML tools and UML diagrams](#)



Visual Paradigm home page
 (<https://www.visual-paradigm.com/>)

Visual Paradigm tutorials
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