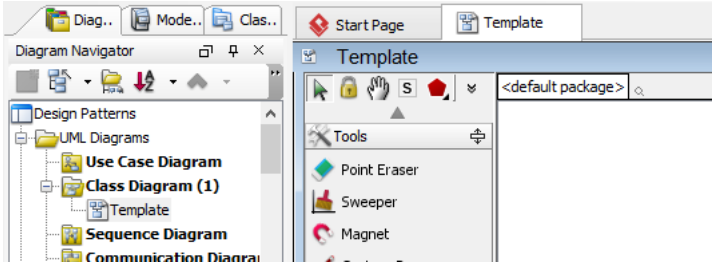
Template Pattern Tutorial

Written Date : October 27, 2009

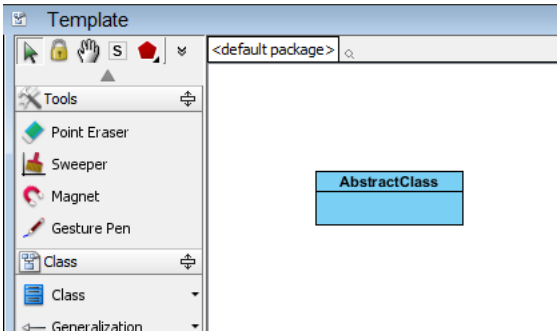
Modeling a Design Pattern with a Class Diagram

1. Create a new project named *Design Patterns*.

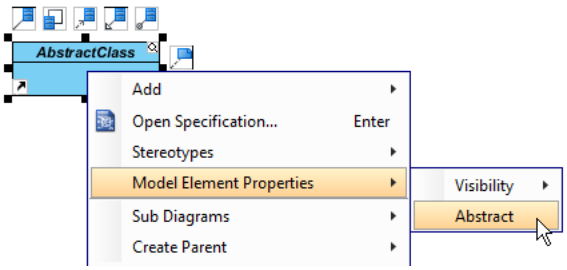
2. Create a class diagram named *Template*.



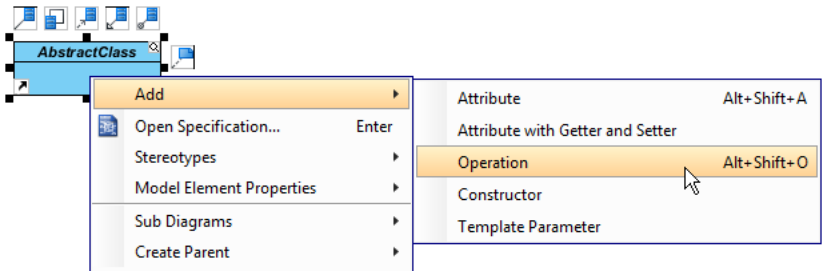
3. Select **Class** from the diagram toolbar. Click on the diagram to create a class and name it *AbstractClass*.



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

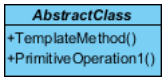


5. Right-click on the *AbstractClass* class and select **Add** > **Operation** from the popup menu.

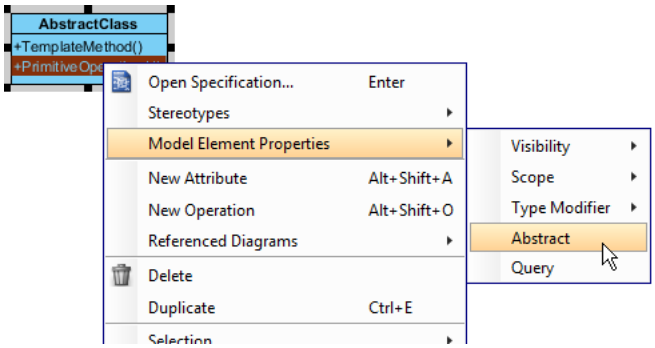


6. Name the operation `TemplateMethod()`.

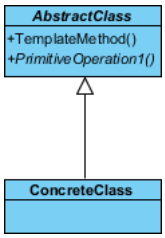
7. Create another operation, `PrimitiveOperation1()`.



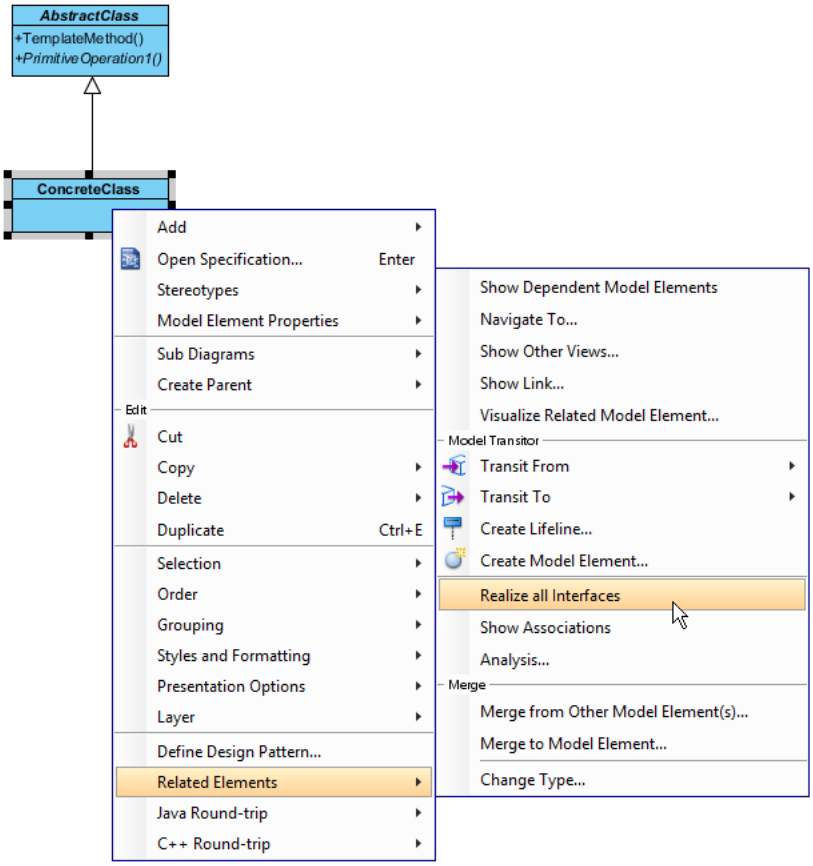
8. Right-click on `PrimitiveOperation1()` and select **Model Element Properties** > **Abstract** to set it as abstract.



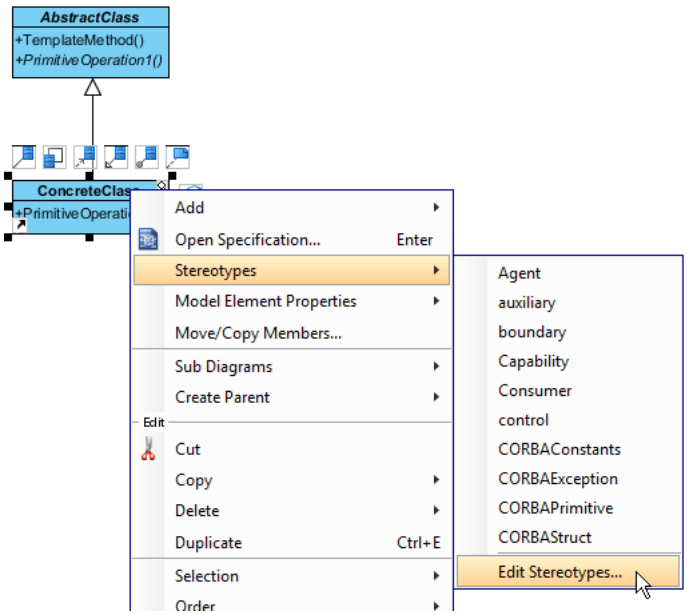
9. Move the mouse cursor over the *AbstractClass* class and drag out **Generalization** > **Class** to create a subclass named *ConcreteClass*.



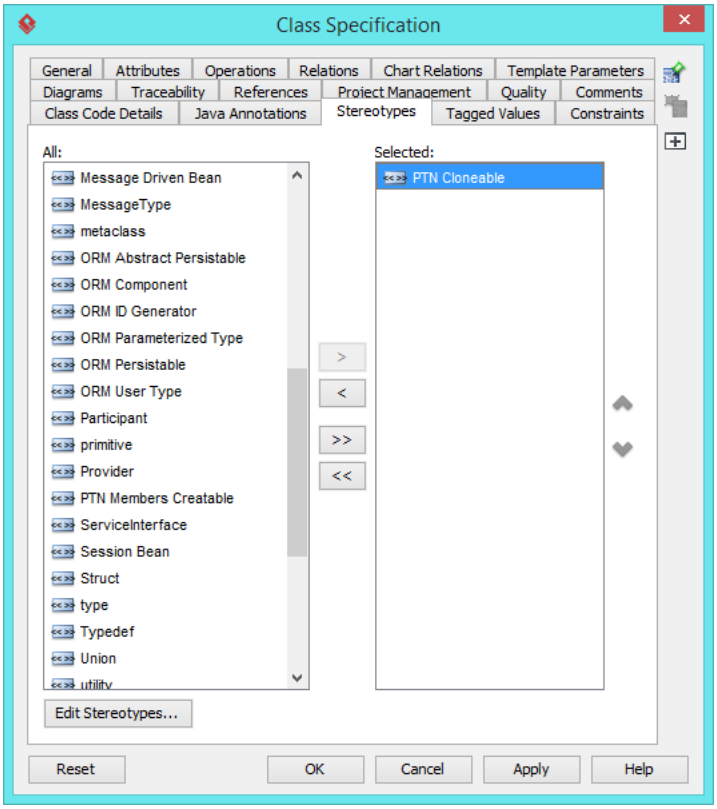
10. We need to make the concrete class inherit operations from the abstract class. Right-click on *ConcreteClass* and select **Related Elements** > **Realize all Interfaces** from the popup menu.



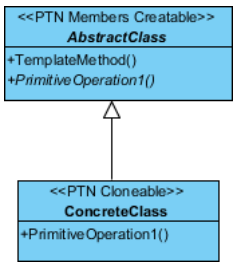
11. In practice, there may be multiple concrete classes. To represent this, stereotype the `ConcreteClass` class as **PTN Cloneable**. Right-click on *ConcreteClass* and select **Stereotypes** > **Stereotypes...** from the popup menu.



12. In the **Stereotypes** tab of the **Class Specification** dialog box, select **PTN Cloneable** and click > to assign it to the *ConcreteClass* class. Click **OK** to confirm.

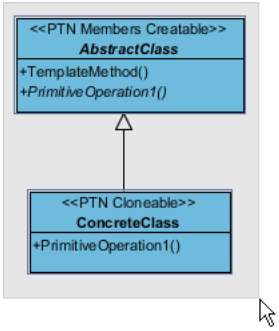


13. There may be multiple primitive operations. To represent this, stereotype the `AbstractClass` class as **PTN Members Creatable**. Follow the same steps as you did for stereotyping the `ConcreteClass` to apply the **PTN Members Creatable** stereotype to `AbstractClass`.

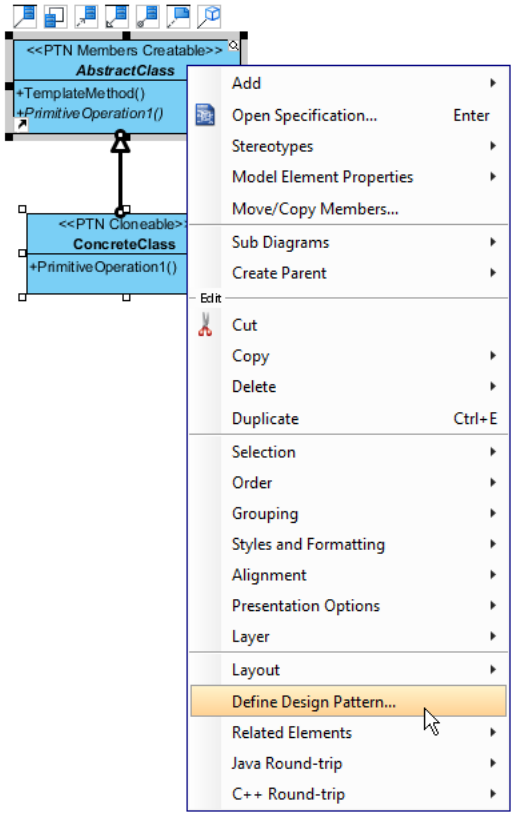


Defining the Pattern

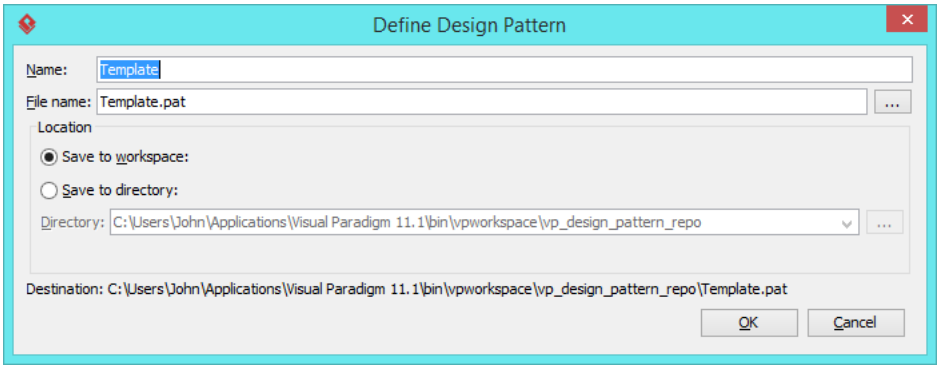
1. Select all classes on the class diagram.



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 as *Template*. Keep the file name as is. Click **OK** to proceed.

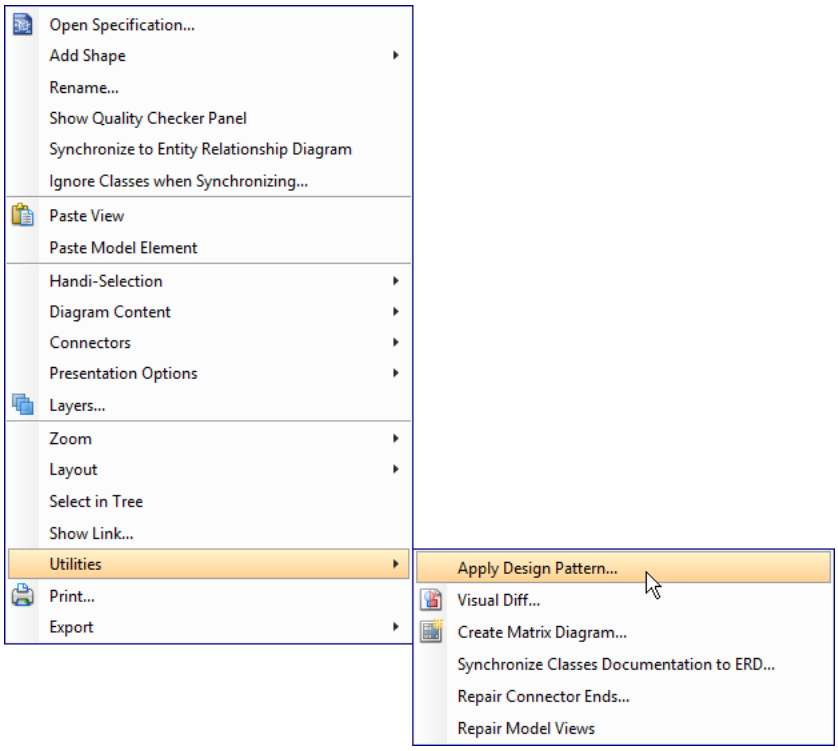


Applying a Design Pattern to a Class Diagram

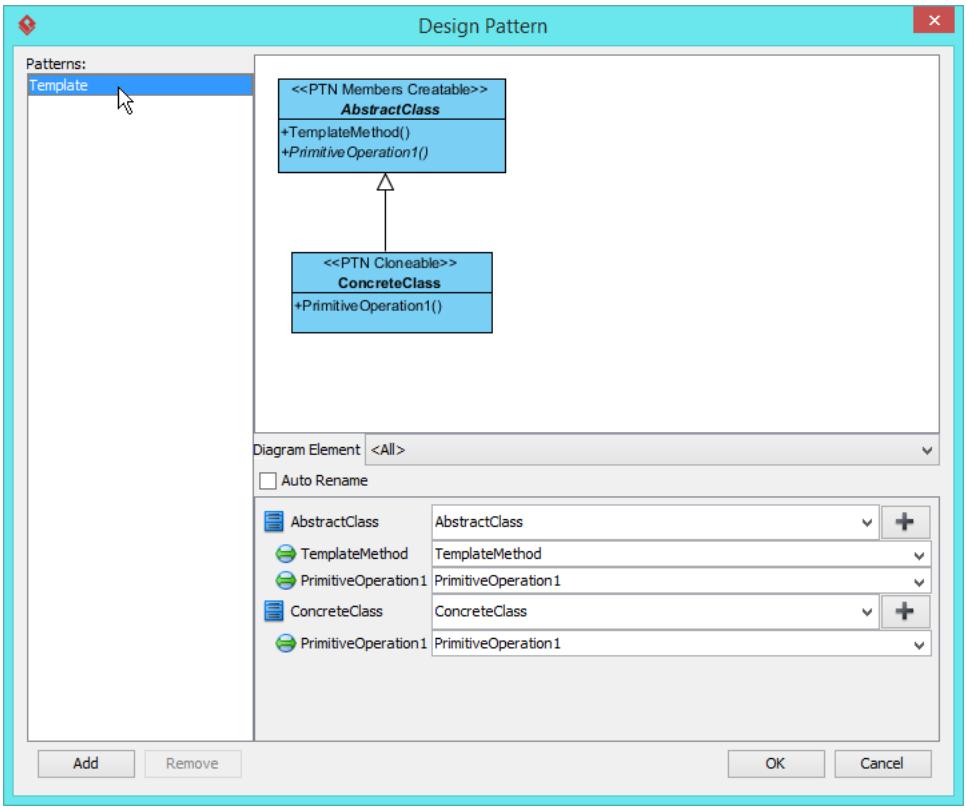
In this section, we are going to apply the template pattern in modeling a diagram editor.

1. Create a new project named *Diagram Editor*.
2. Create a class diagram named *Domain Model*.

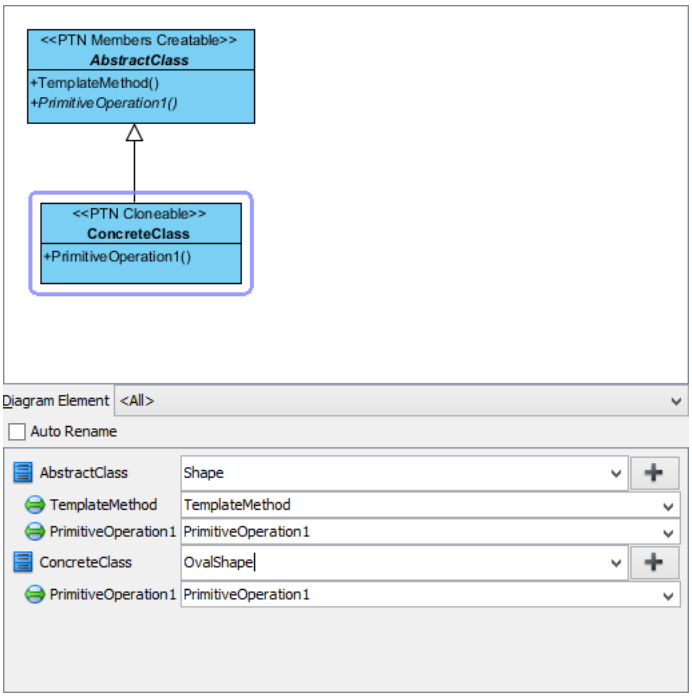
3. Right-click on the class diagram and select **Utilities** > **Apply Design Pattern...** from the popup menu.



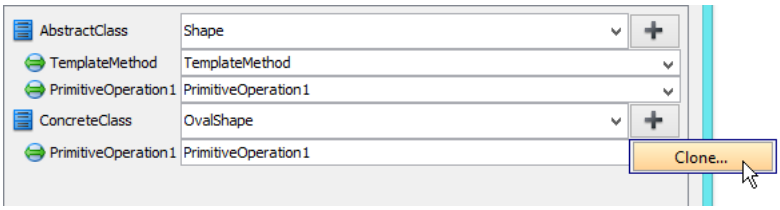
4. In the **Design Pattern** dialog box, select *Template* from the list of patterns.



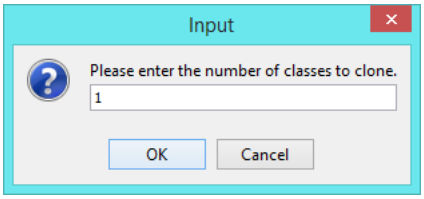
5. In the bottom pane, rename *AbstractClass* and *ConcreteClass* to *Shape* and *OvalShape*, respectively.



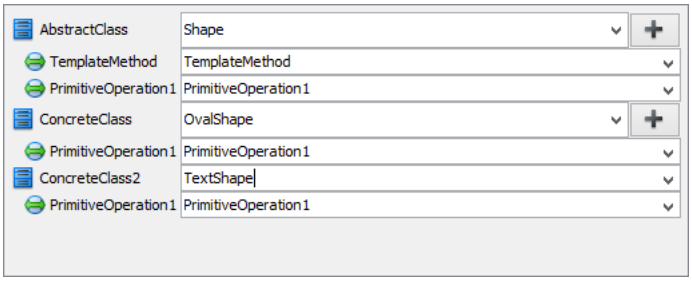
6. We need one more concrete class for a text shape. Click the **+** button next to *ConcreteClass* and select **Clone...** from the popup menu.



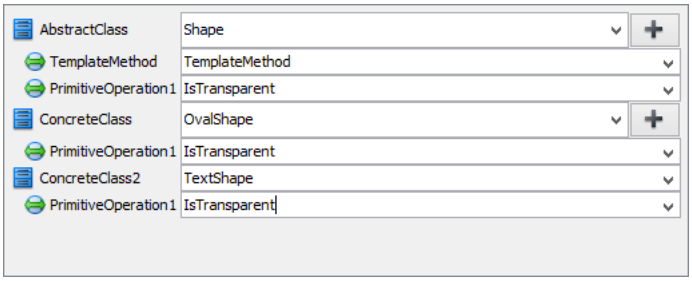
7. Enter `1` as the number of classes to clone and click **OK** to confirm.



8. Rename *ConcreteClass2* to *TextShape*.

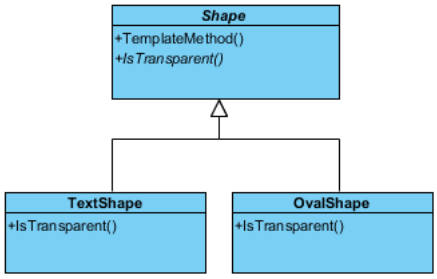


9. Rename *TemplateMethod* and *PrimitiveOperation1* to *Render* and *IsTransparent*, respectively.



10. Click **OK** to apply the pattern to the diagram.

11. Tidy up the diagram. Here is the result:



Resources

1. Design Patterns.vpp
2. Template.pat

Related Links

- Full set of UML tools and UML diagrams

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

Visual Paradigm tutorials
(https://www.visual-paradigm.com/tutorials/)