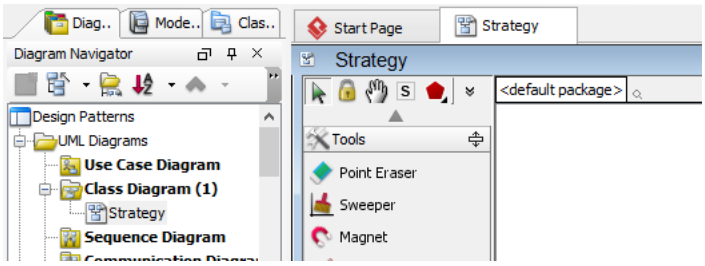
Strategy Pattern Tutorial

Written Date : October 27, 2009

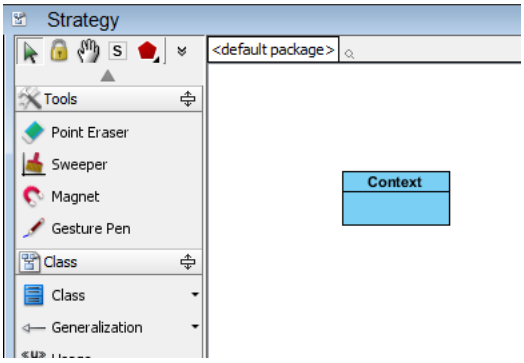
Modeling a Design Pattern with a Class Diagram

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

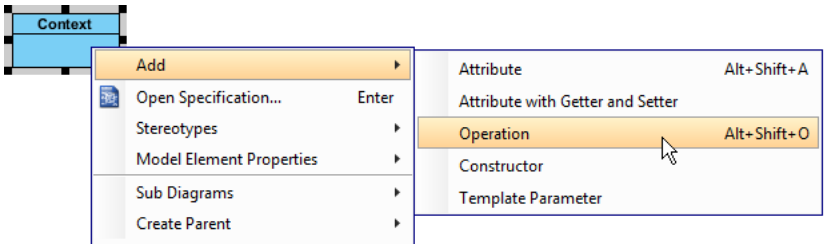
2. Create a class diagram named *Strategy*.



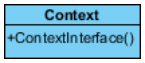
3. Select **Class** from the diagram toolbar. Click on the diagram to create a class and name it *Context*.



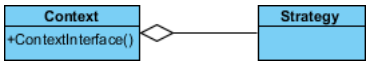
4. Right-click on the *Context* class and select **Add** > **Operation** from the popup menu.



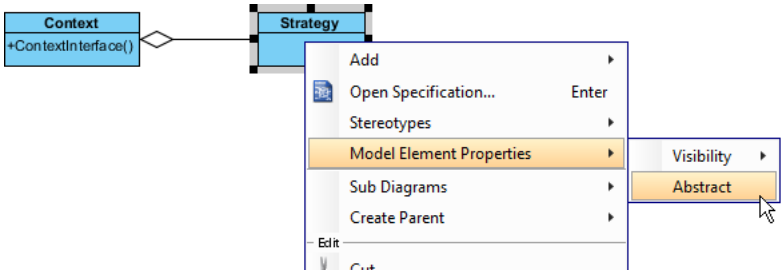
5. Name the operation `ContextInterface()`.



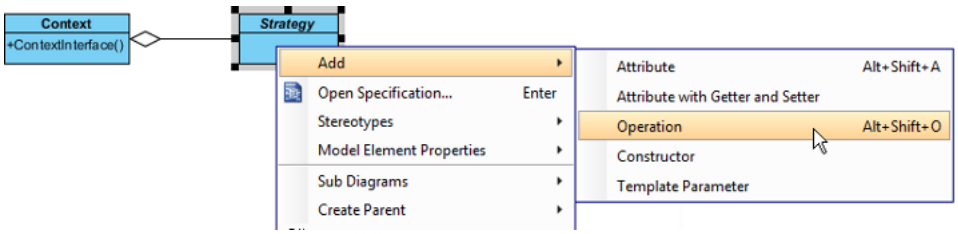
6. Move the mouse cursor over the *Context* class and drag out **Aggregation** > **Class** to create an associated class named *Strategy*.



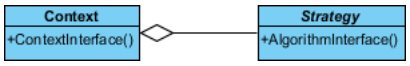
7. Right-click on *Strategy* and select **Model Element Properties** > **Abstract** to set it as abstract.



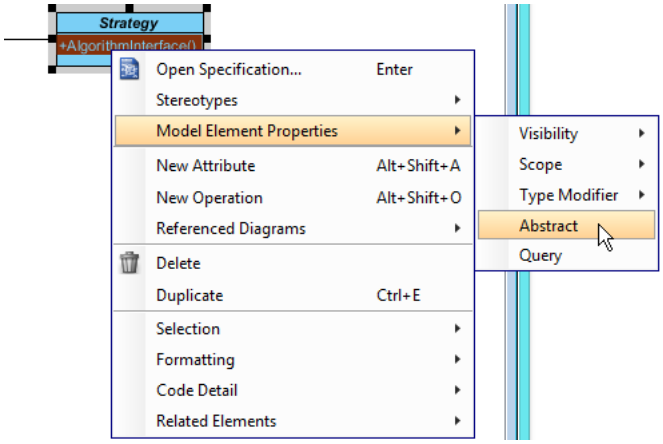
8. Right-click on the *Strategy* class and select **Add** > **Operation** from the popup menu.



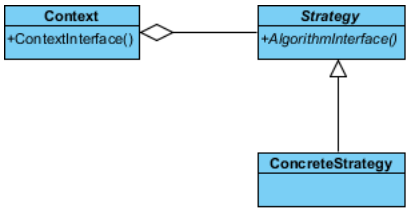
9. Name the operation `AlgorithmInterface()`.



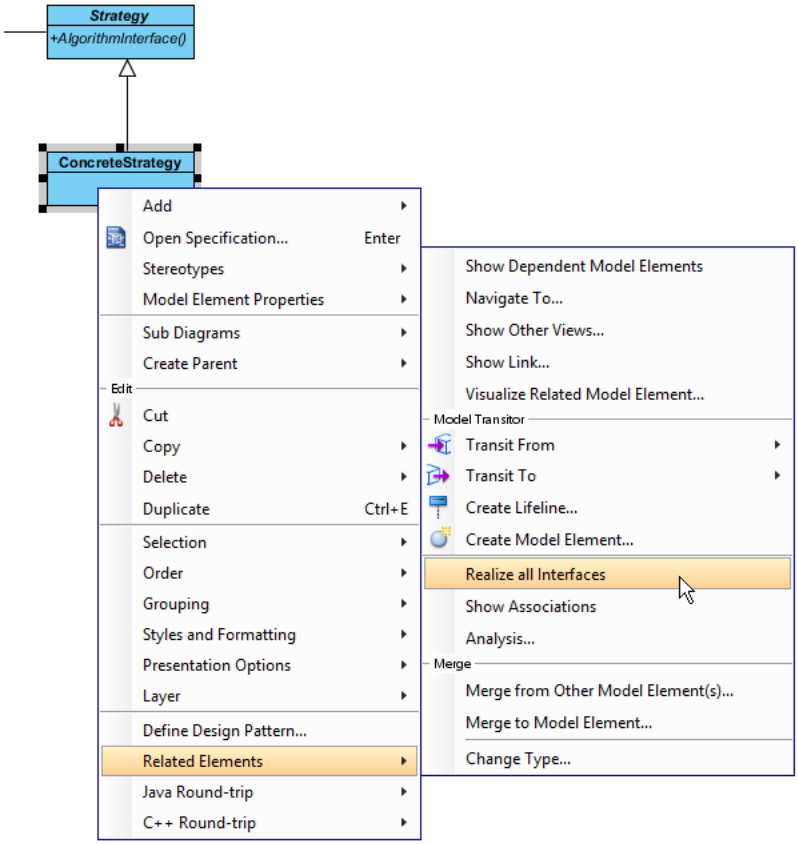
10. Right-click on the *AlgorithmInterface()* operation and select **Model Element Properties** > **Abstract** to set it as abstract.



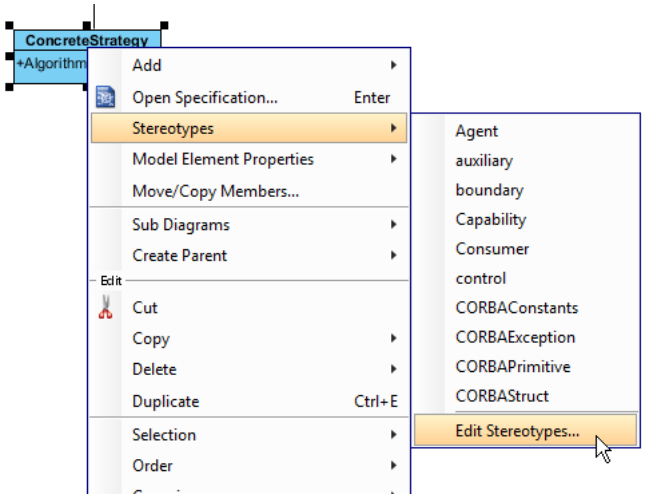
11. Move the mouse cursor over the *Strategy* class and drag out **Generalization** > **Class** to create a subclass named *ConcreteStrategy*.



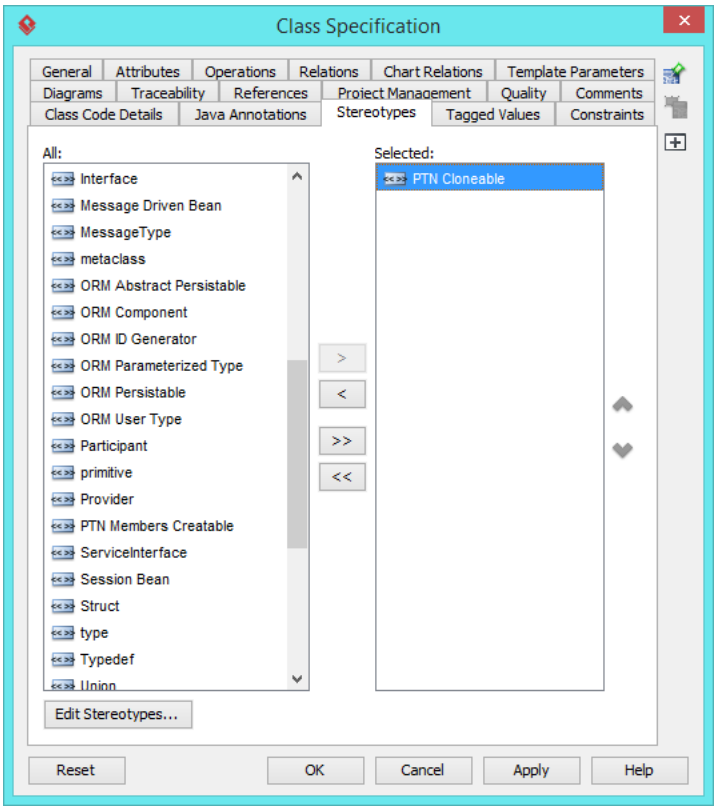
12. We need to make the concrete strategy inherit operations from the strategy class. Right-click on *ConcreteStrategy* and select **Related Elements** > **Realize all Interfaces** from the popup menu.



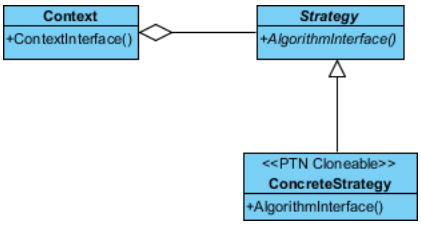
13. In practice, there may be multiple concrete strategies. To represent this, stereotype the `ConcreteStrategy` class as **PTN Cloneable**. Right-click on *ConcreteStrategy* and select **Stereotypes** > **Stereotypes...** from the popup menu.



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

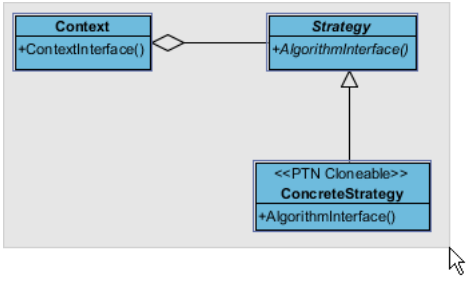


At this point, the diagram should look like this:

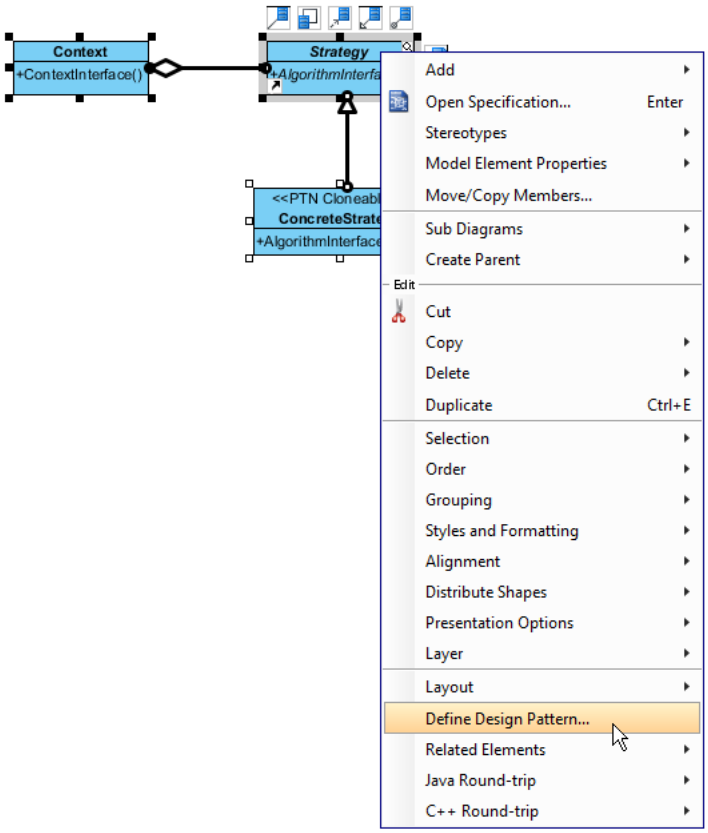


Defining the Pattern

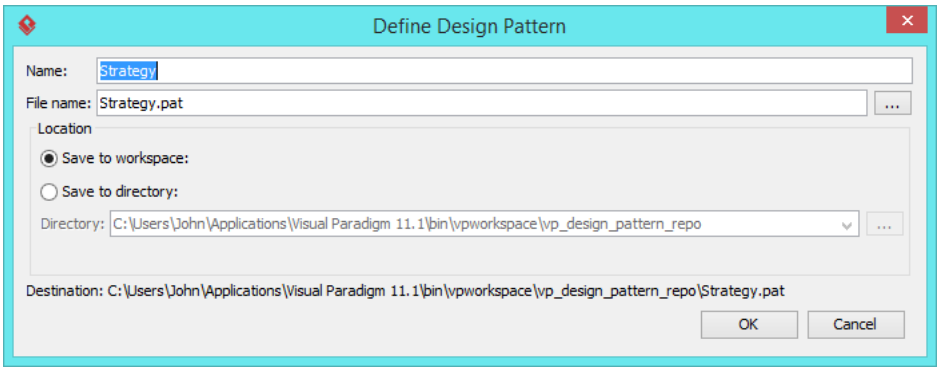
1. Select all classes on the class diagram.



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

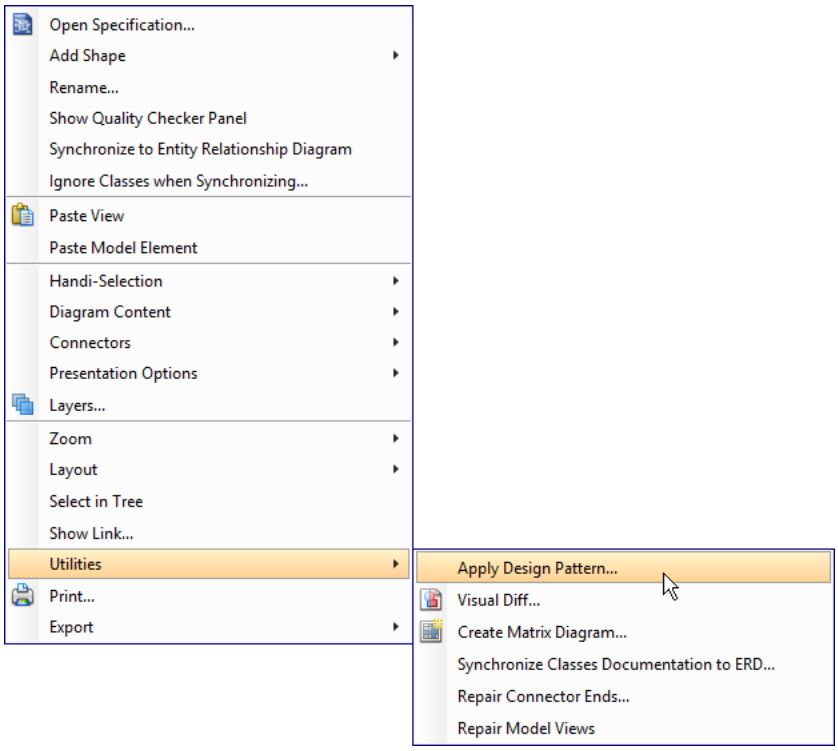


Applying a Design Pattern to a Class Diagram

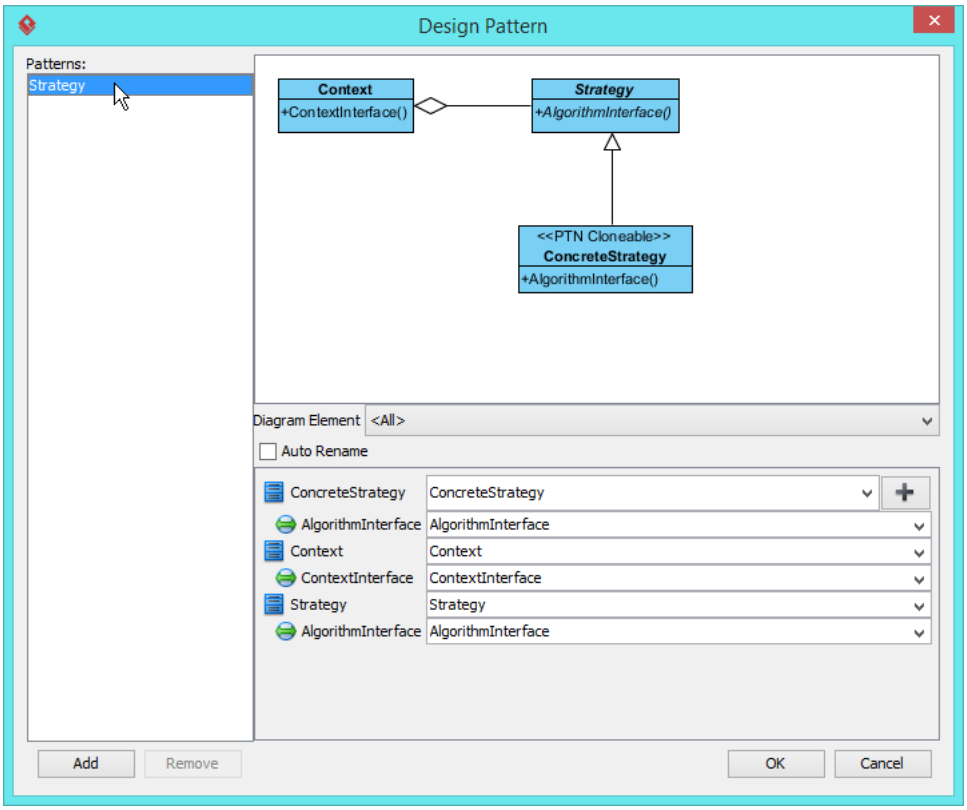
In this section, we are going to apply the strategy pattern in modeling a video game.

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

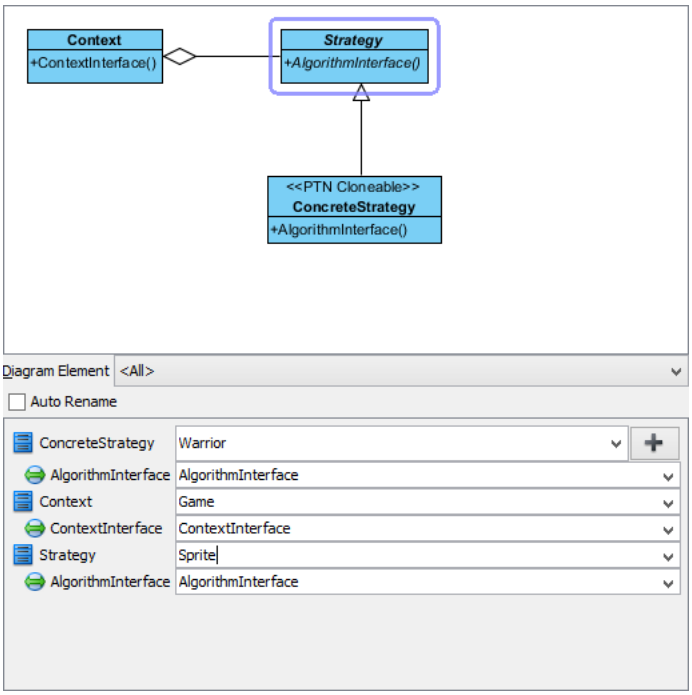
3. Right-click on the class diagram and select **Utilities** > **Apply Design Pattern...** from the popup menu.



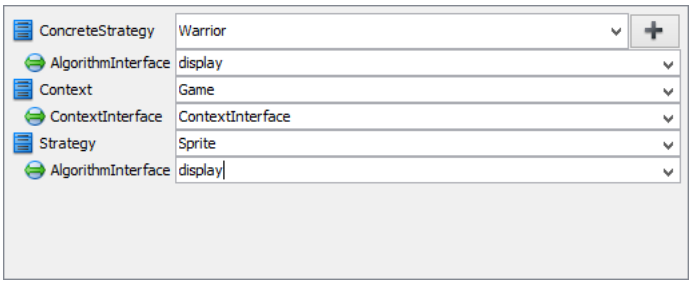
4. In the **Design Pattern** dialog box, select *Strategy* from the list of patterns.



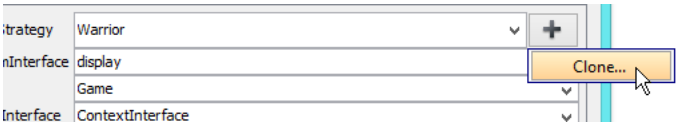
5. In the bottom pane, rename *Context*, *Strategy*, and *ConcreteStrategy* to *Game*, *Sprite*, and *Warrior*, respectively.



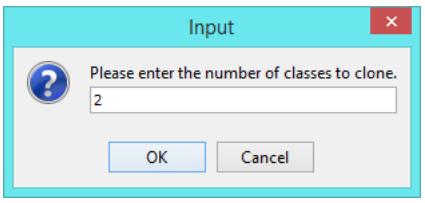
6. Rename the `AlgorithmInterface` operation to `display`.



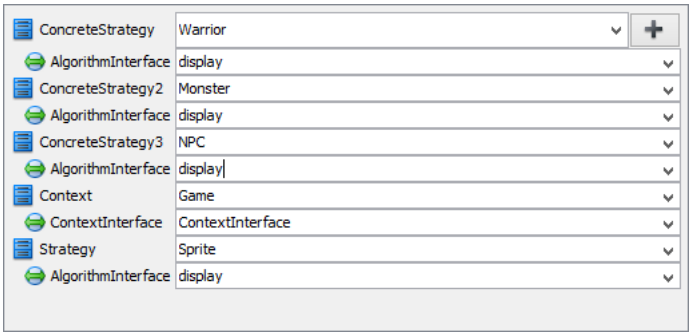
7. We need two more concrete strategies for *Monster* and *NPC*. Click the **+** button in the *ConcreteStrategy* row and select **Clone...** from the popup menu.



8. Enter `2` as the number of classes to clone and click **OK** to confirm.

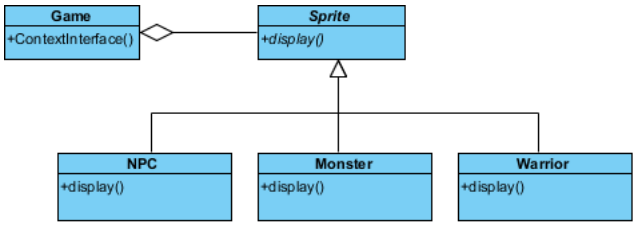


9. Rename *ConcreteStrategy2* and *ConcreteStrategy3* to *Monster* and *NPC*, and their `AlgorithmInterface` operations to `display`.



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. Strategy.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/)