

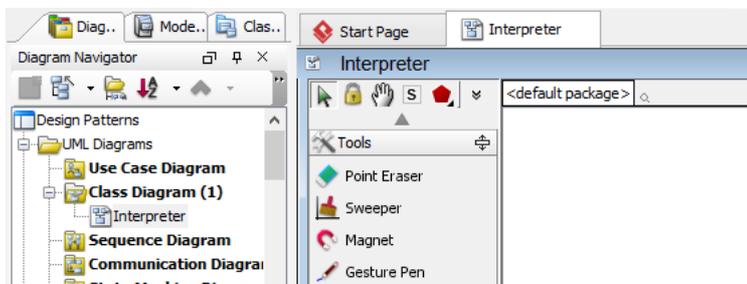


Interpreter Pattern Tutorial

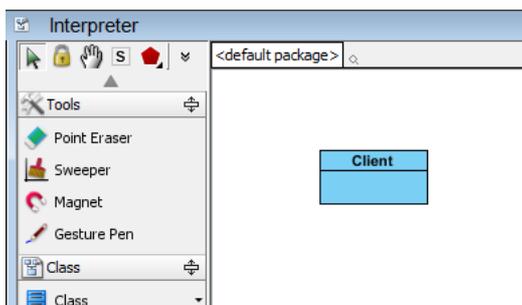
Written Date : October 14, 2009

Modeling a Design Pattern with a Class Diagram

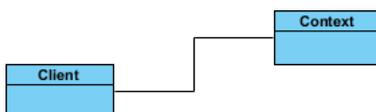
1. Create a new project named *Design Patterns*.
2. Create a class diagram named *Interpreter*.



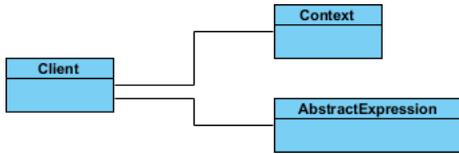
3. Select **Class** from the diagram toolbar. Click on the diagram to create a class. Name it *Client*.



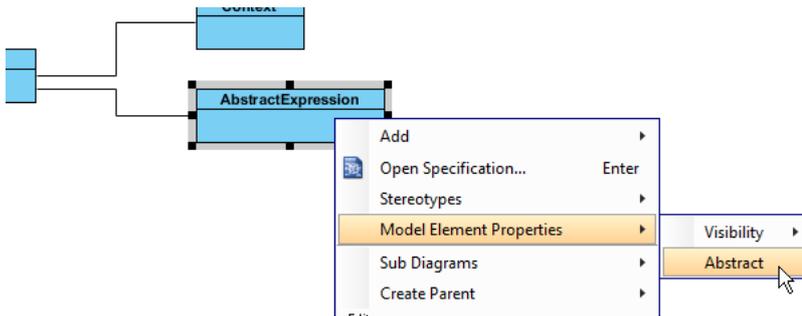
4. Move the mouse cursor over the *Client* class, and drag out **Association > Class** to create an associated class *Context*.



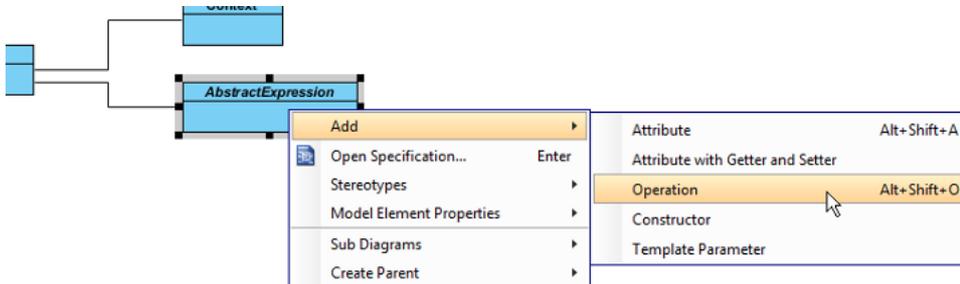
5. Move the mouse cursor over the *Client* class, and drag out **Association > Class** to create an associated class *AbstractExpression*.



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

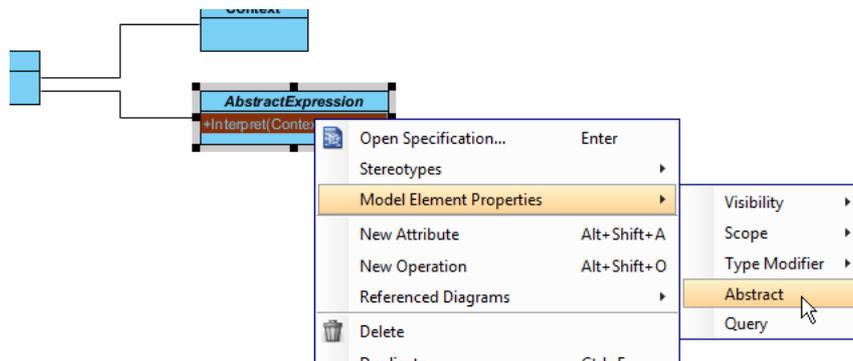


7. Right-click on the *AbstractExpression* class and select **Add > Operation** from the popup menu.

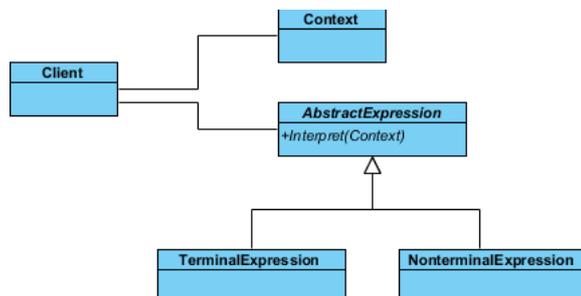


8. Name the operation *Interpret(Context)*.

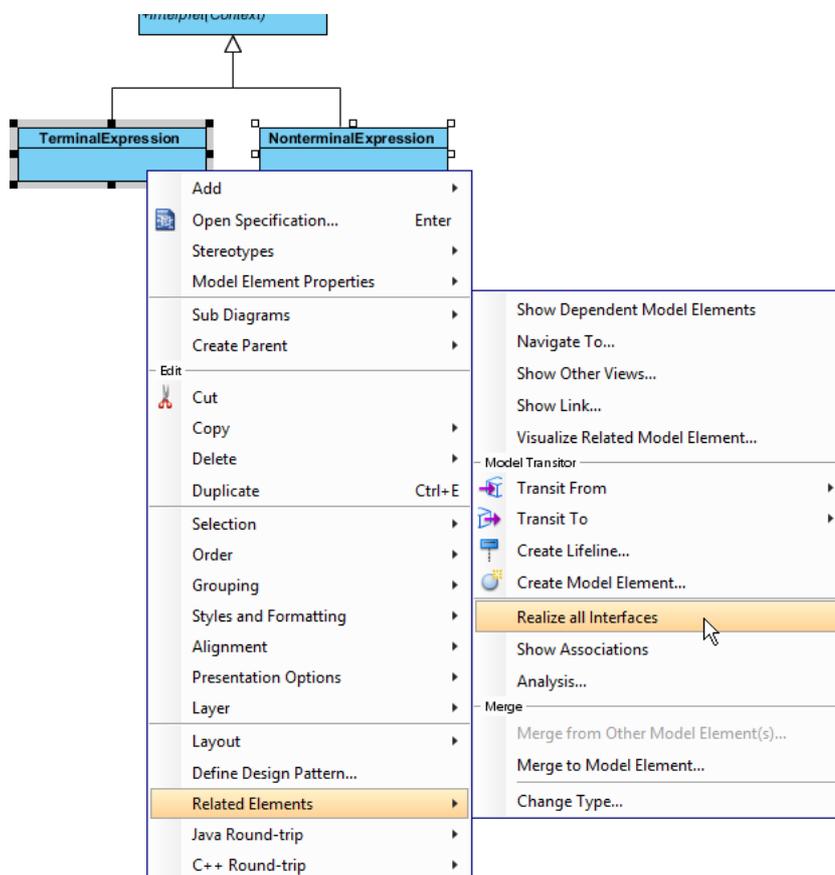
- Right-click on *Interpret(Context)* and select **Model Element Properties > Abstract** to set it as abstract.



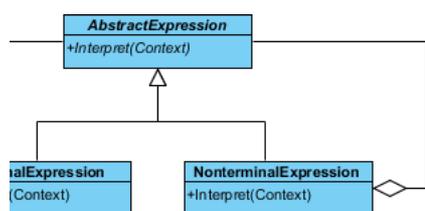
- Move the mouse cursor over the *AbstractExpression* class, and drag out **Generalization > Class** to create a subclass *TerminalExpression*. Repeat this step to create another subclass *NonterminalExpression* from *AbstractExpression*.



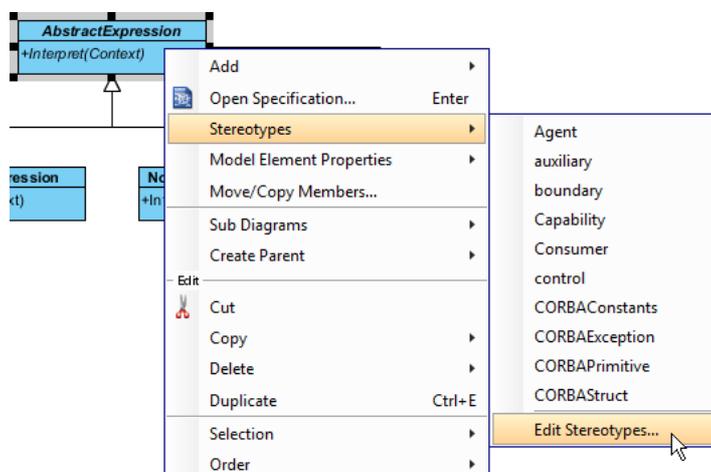
11. *TerminalExpression* and *NonterminalExpression* will inherit the operations from *AbstractExpression*. Select *TerminalExpression* and *NonterminalExpression*, right-click on them, and select **Related Elements > Realize all Interfaces** from the popup menu.



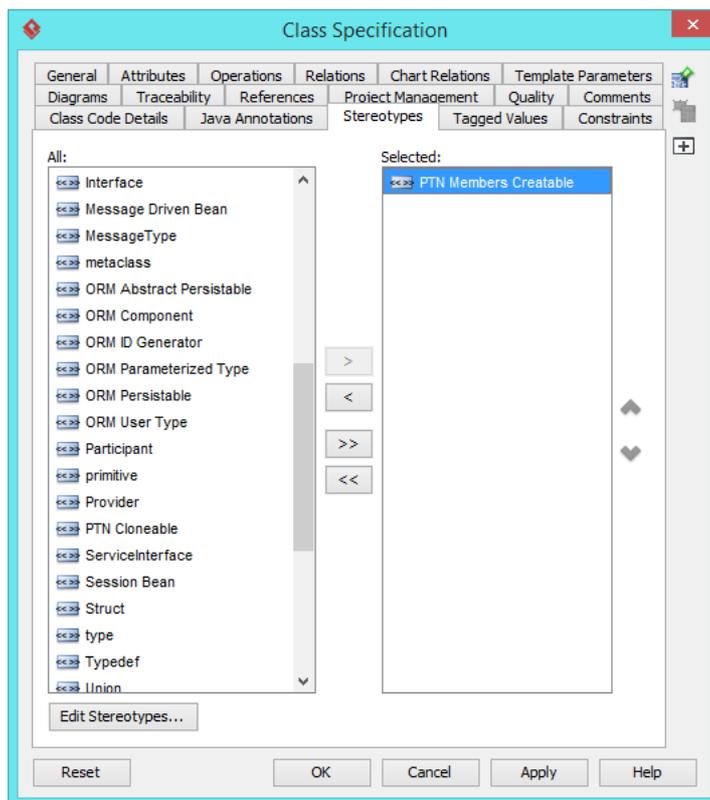
12. Move the mouse cursor over the *NonterminalExpression* class, and drag out **Aggregation > Class** to *AbstractExpression*.



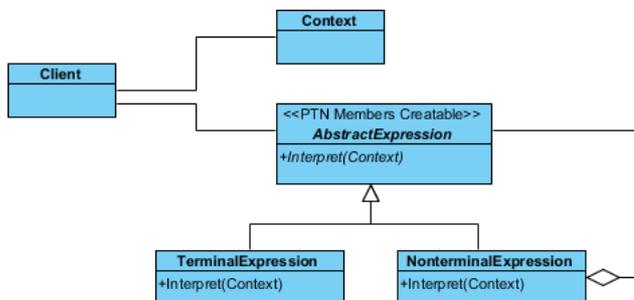
13. In practice, there may be multiple operations in *AbstractExpression*. To represent this, stereotype the class *AbstractExpression* as **PTN Members Creatable**. Right-click on *AbstractExpression* and select **Stereotypes > Stereotypes...** from the popup menu.



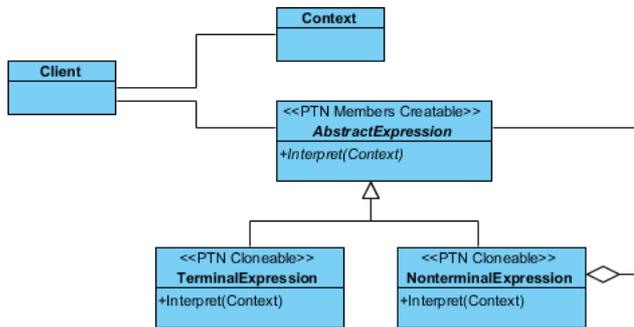
- In the **Stereotypes** tab of the **Class Specification** dialog box, select **PTN Members Creatable** and click **>** to assign it to the *AbstractExpression* class. Click **OK** to confirm.



Up to now, the diagram should look like this:

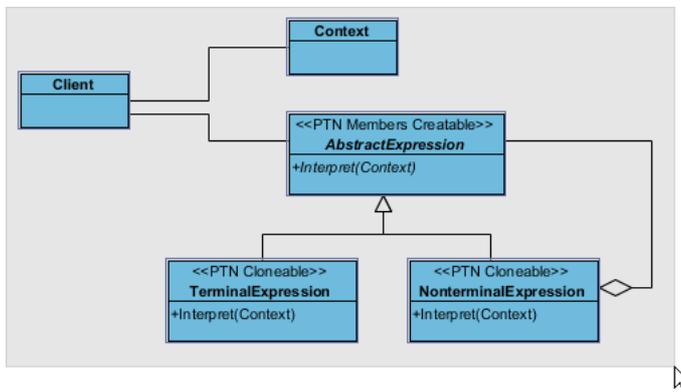


15. In practice, there may be multiple *TerminalExpression* and/or *NonterminalExpression*. To represent this, assign them with **PTN Cloneable**, by following steps 13 and 14.

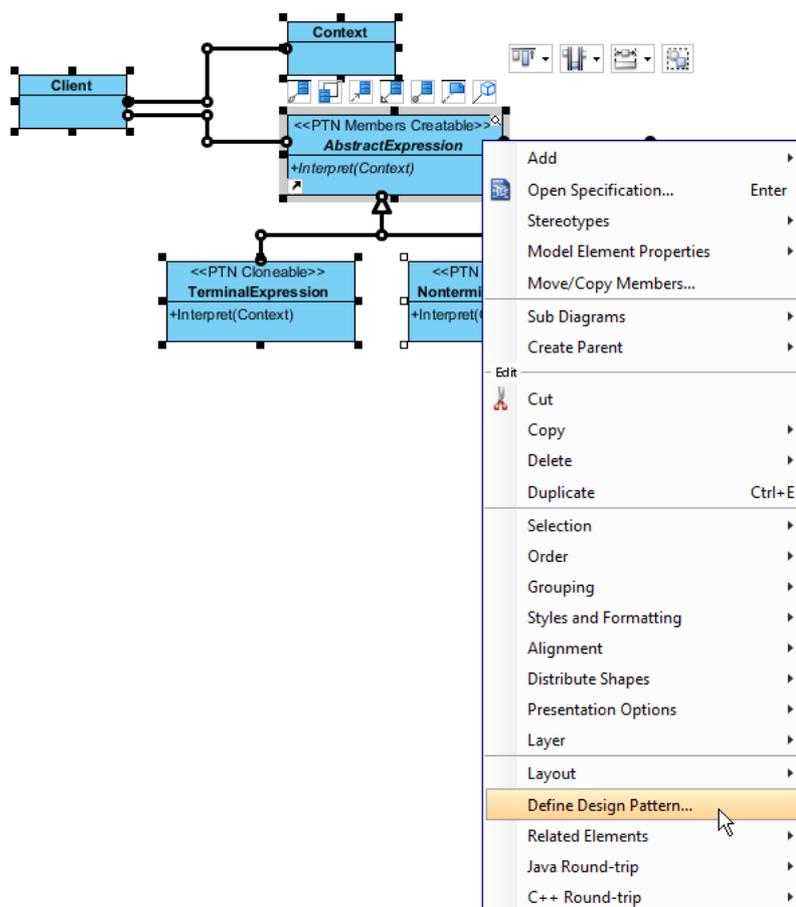


Defining a Pattern

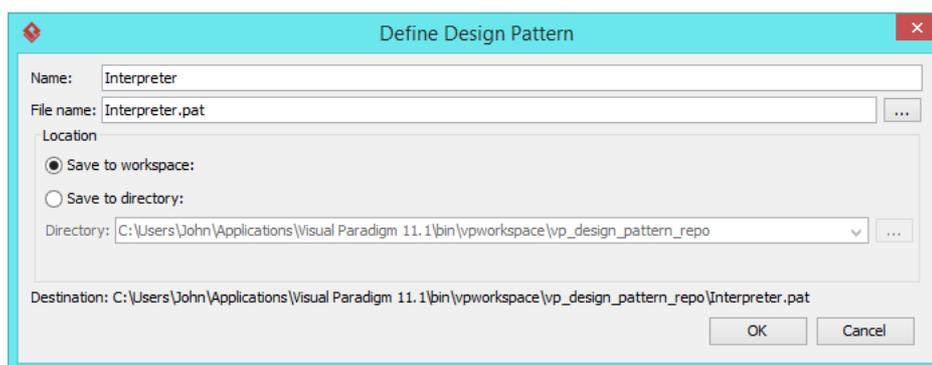
1. Select all classes on the class diagram.



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



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

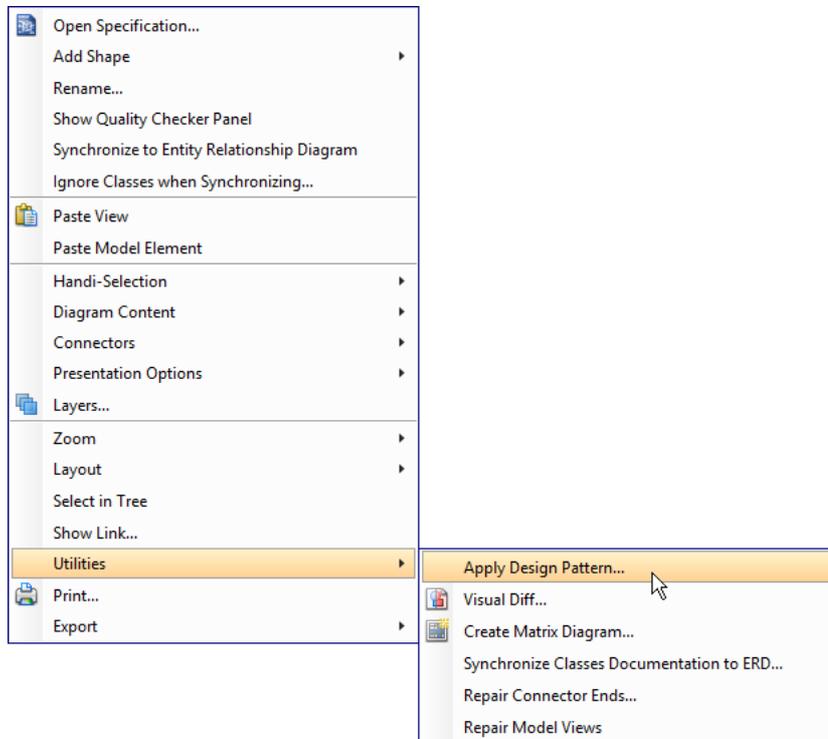


Applying a Design Pattern on a Class Diagram

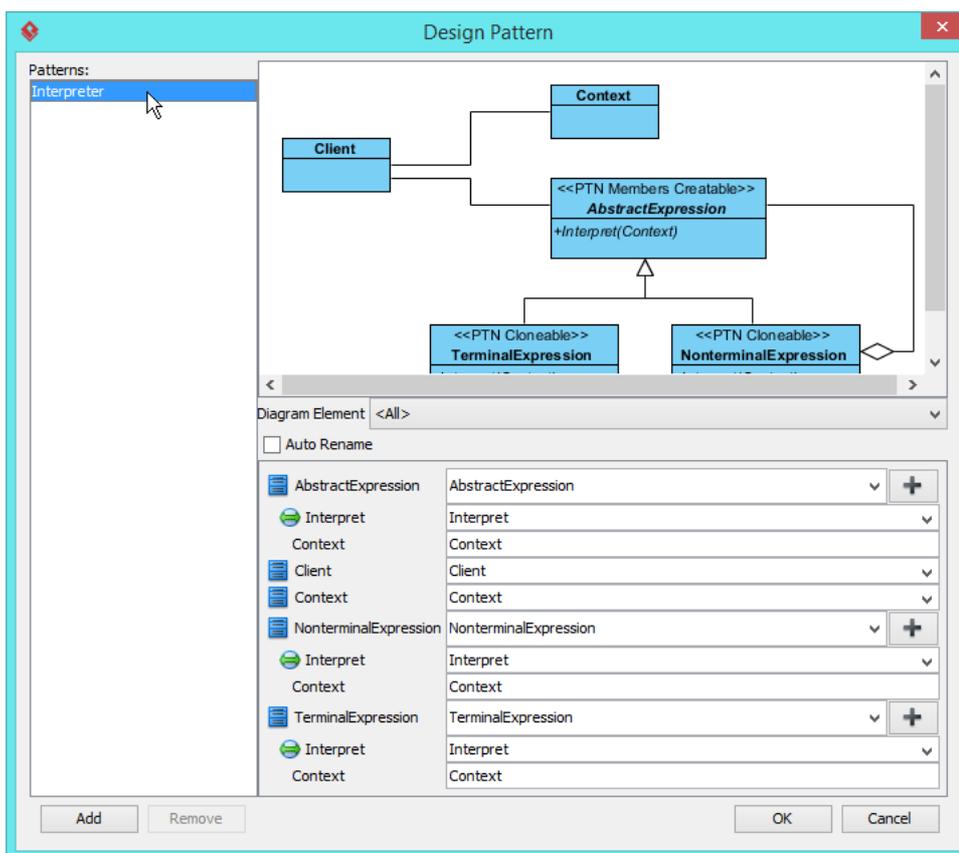
In this section, we are going to apply the interpreter pattern to model the interpretation of an expression.

- Create a new project *Expression*.

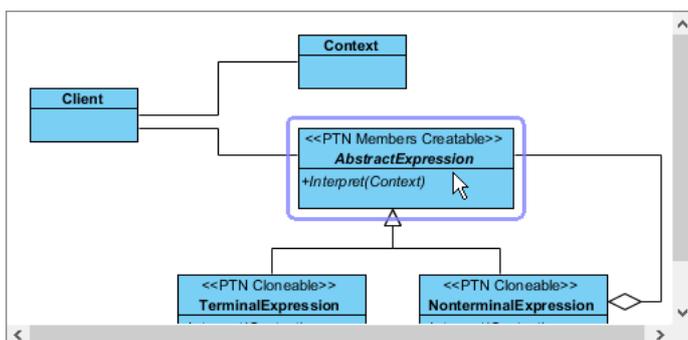
2. Create a class diagram *Expression*.
3. Right-click on the class diagram and select **Utilities > Apply Design Pattern...** from the popup menu.



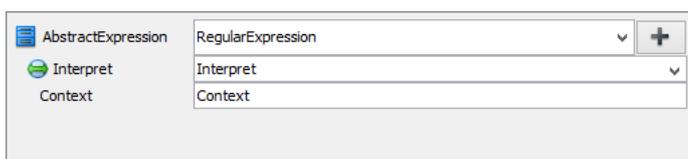
- In the **Design Pattern** dialog box, select *Interpreter* from the list of patterns.



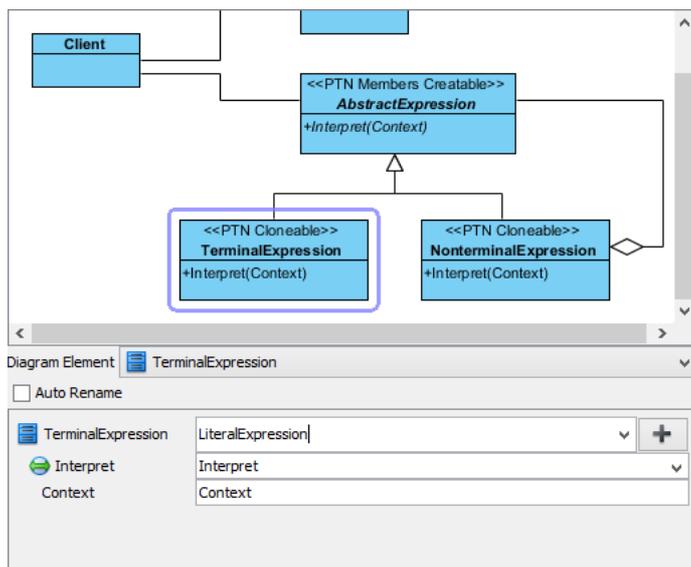
- Click on *AbstractExpression* in the overview.



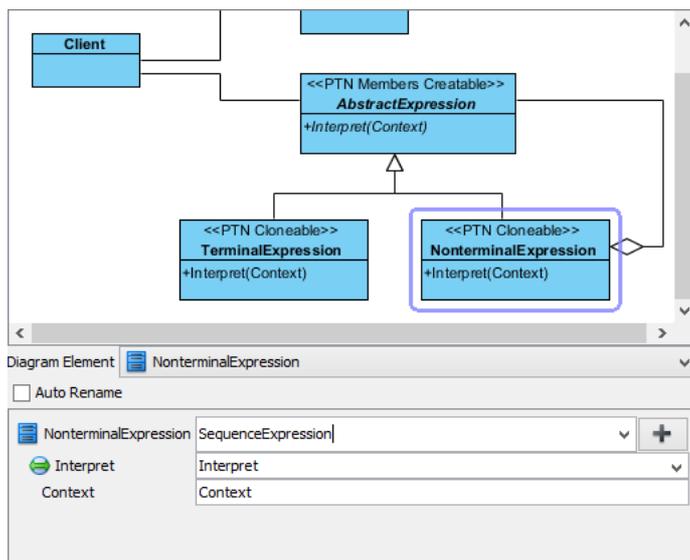
- Rename *AbstractExpression* to *RegularExpression*.



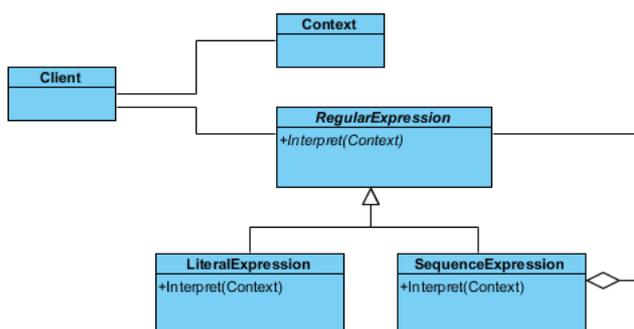
7. Select *TerminalExpression* in the overview, and rename it to *LiteralExpression* at the bottom pane.



8. Select *NonterminalExpression* in the overview, and rename it as *SequenceExpression* at the bottom pane. Click **OK** to apply the pattern to the diagram.



This is the result:



Resources

1. [Design Patterns.vpp](#)
2. [Interpreter.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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