This tutorial is aimed to guide the definition and application of Gang of Four (GoF) strategy design pattern. By reading this tutorial, you will know how to develop a model for the strategy pattern, and how to apply it in practice.

**Modeling Design Pattern with Class Diagram**

1. Create a new project Design Patterns.
2. Create a class diagram Strategy.
3. Select Class from diagram toolbar. Click on the diagram to create a class. Name it as 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 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 `AlgorithmInterface`, 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 subclasses `ConcreteStrategy`. 
12. We need to make the concrete strategies 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 class `ConcreteStrategy` as `PTN Cloneable`. Right right 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 **ConcreteStrategy** class. Click **OK** to confirm.

Up to now, the diagram should look like:

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

### Applying Design Pattern on Class Diagram
In this section, we are going to apply the strategy pattern in modeling a video game.

1. Create a new project Game.
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 *Strategy* from the list of patterns.

5. At the bottom pane, rename *Context*, *Strategy* and *ConcreteStrategy* to *Game*, *Sprite* and *Warrior*.
6. Rename operations `AlgorithmInterface` to display.

7. We need 2 more concrete strategy for Monster and NPC. Click on the + button at the `ConcreteStrategy` row and select `Clone...` from the popup menu.

8. Enter 2 to be the number of classes to clone. Click **OK** to confirm.

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

10. Click **OK** to apply the pattern to 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/)