



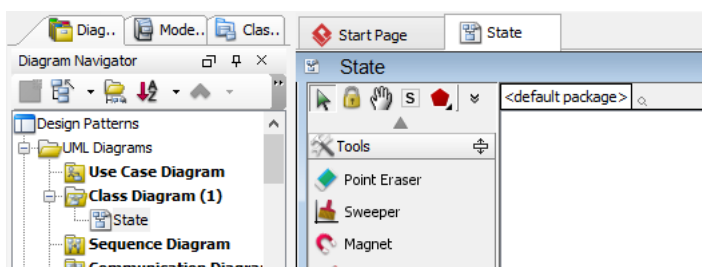
State Pattern Tutorial

Written Date : October 27, 2009

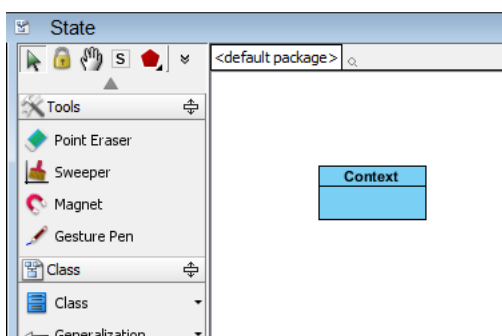
This tutorial is aimed to guide the definition and application of [Gang of Four \(GoF\)](#) state [design pattern](#). By reading this tutorial, you will know how to develop a model for the state pattern, and how to apply it in practice.

Modeling Design Pattern with Class Diagram

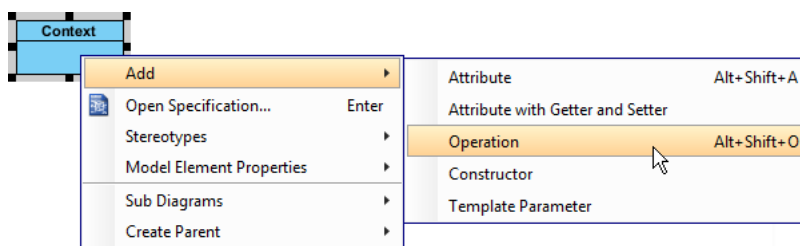
1. Create a new project *Design Patterns*.
2. Create a class diagram *State*.



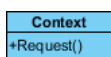
3. Select **Class** from diagram toolbar. Click on the diagram to create a class. Name it as *Context*.



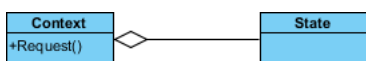
- Right-click on the *Context* class, and select **Add > Operation** from the popup menu.



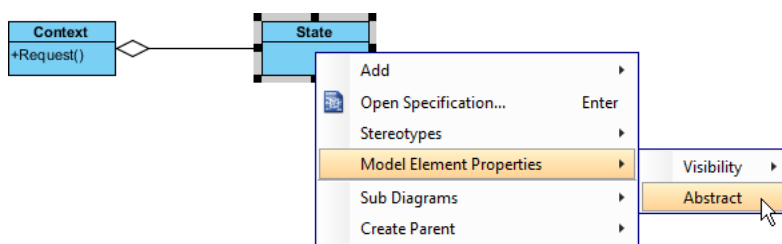
- Name the operation *Request()*.



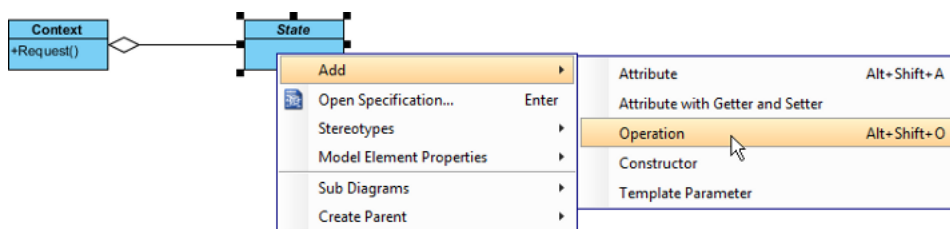
- Move the mouse cursor over the *Context* class, and drag out **Aggregation > Class** to create an associated class *State*.



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



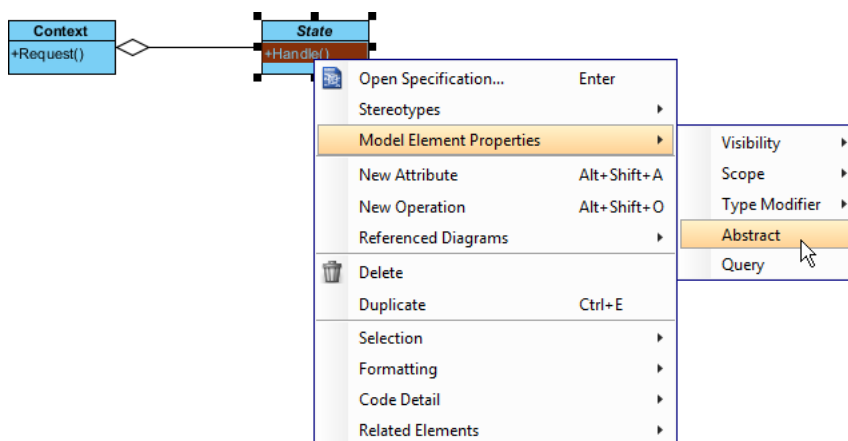
- Right-click on the *State* class, and select **Add > Operation** from the popup menu.



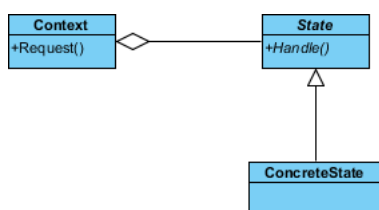
- Name the operation *Handle()*.



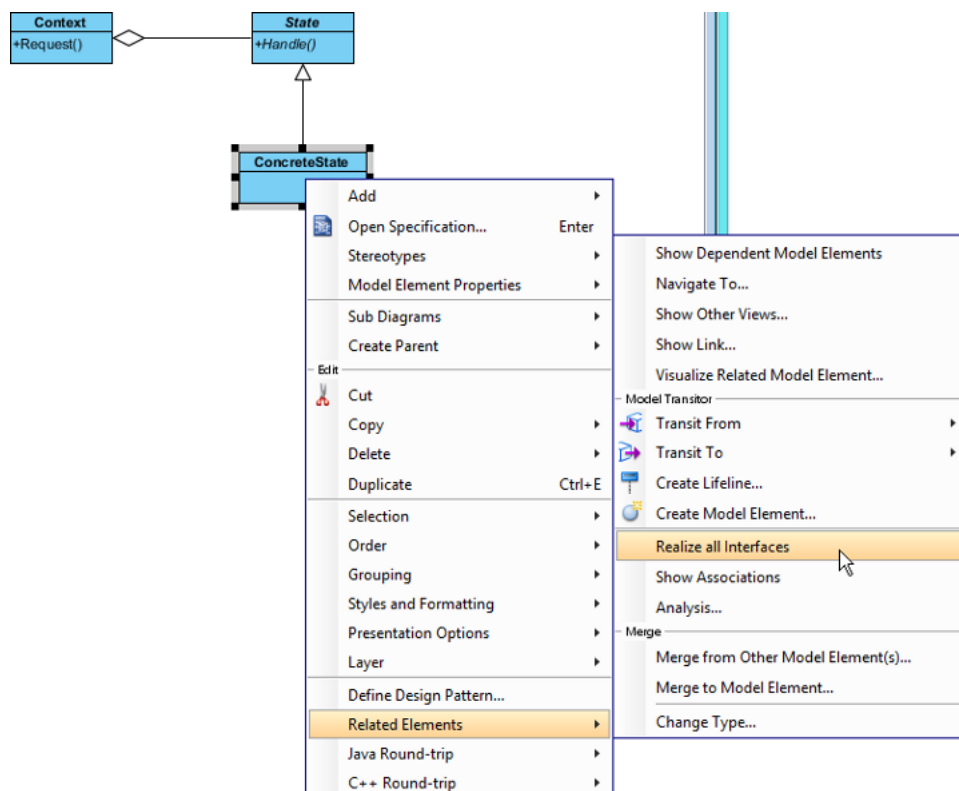
10. Right-click on *Handle*, and select **Model Element Properties** > **Abstract** to set it as abstract.



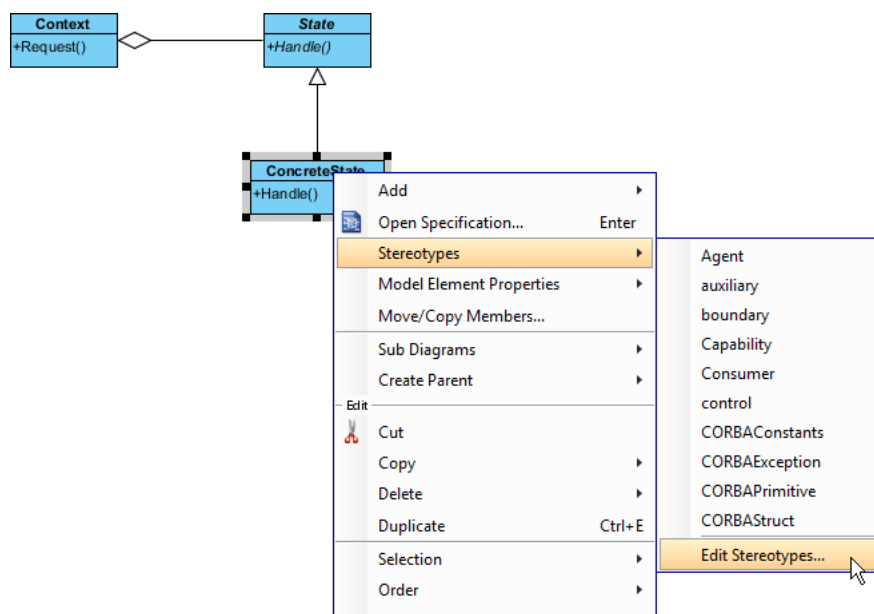
11. Move the mouse cursor over the *State* class, and drag out **Generalization** > **Class** to create subclasses *ConcreteState*.



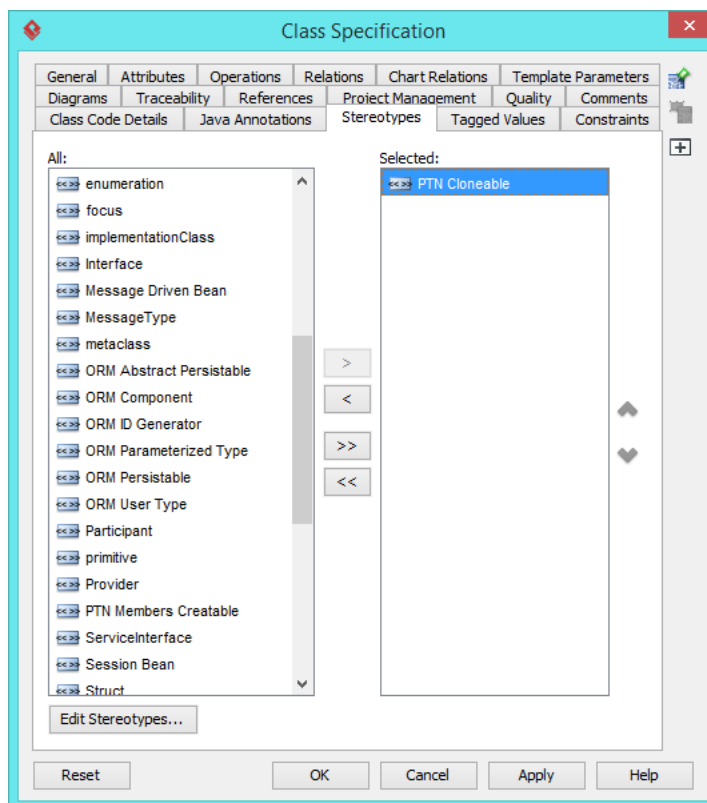
12. We need to make the concrete states inherit operations from the state class. Right-click on *ConcreteState* and select **Related Elements > Realize all Interfaces** from the popup menu.



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

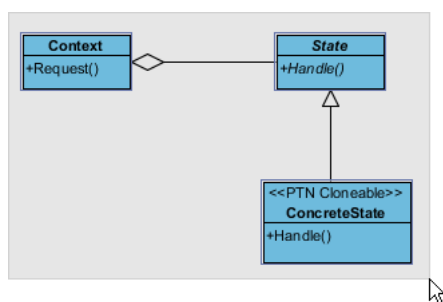


14. In the **Stereotypes** tab of the **Class Specification** dialog box, select **PTN Cloneable** and click **>** to assign it to *ConcreteState* class. Click **OK** to confirm.

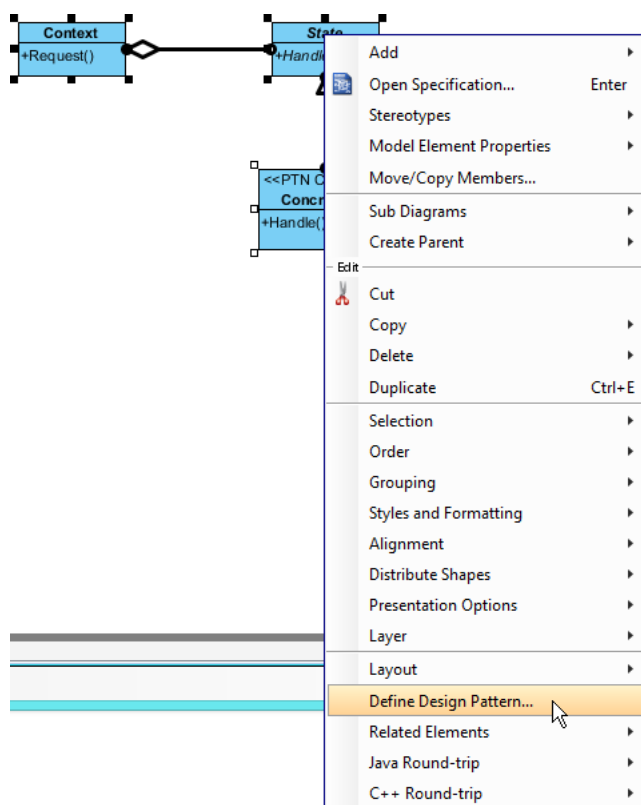


Defining Pattern

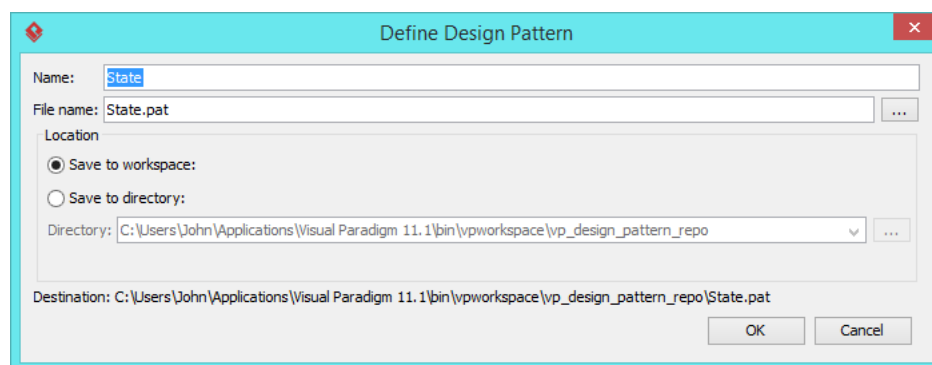
1. Select all classes on the class diagram.



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

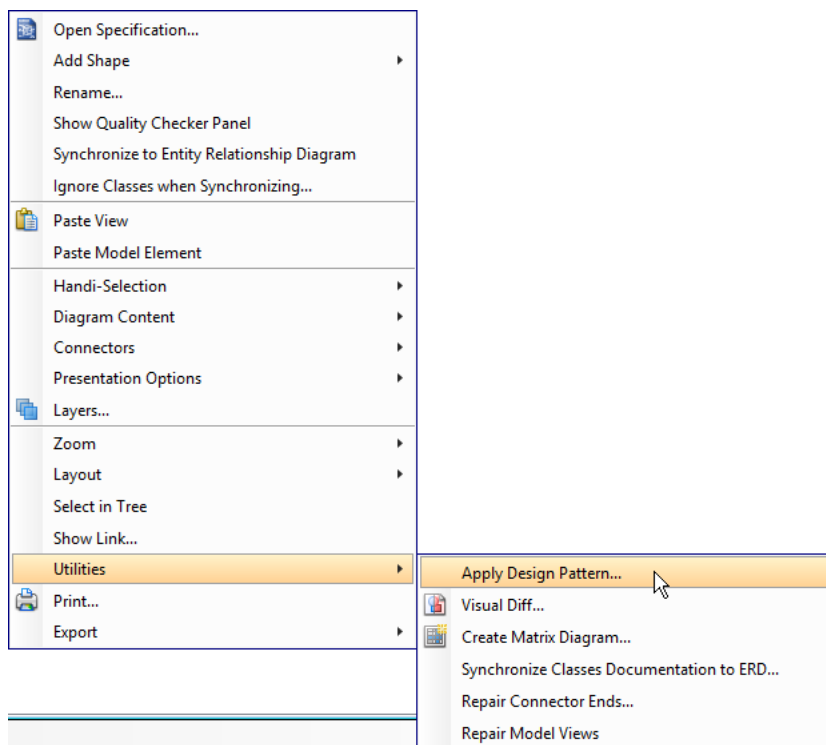


Applying Design Pattern on Class Diagram

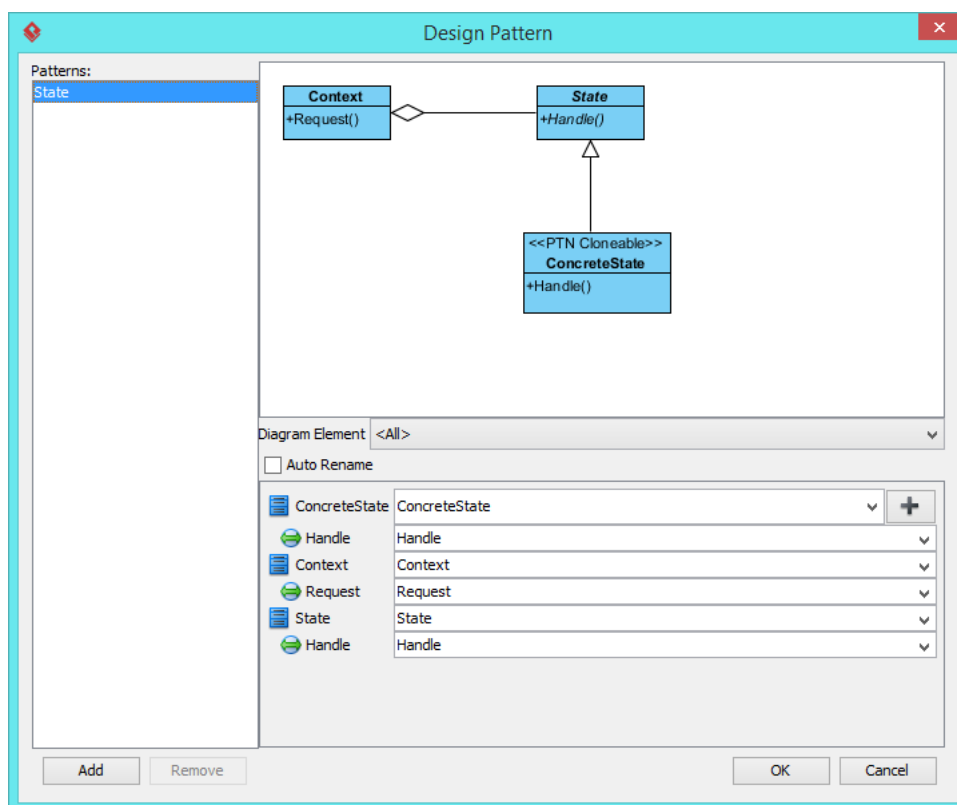
In this section, we are going to apply the state pattern in modeling a life.

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

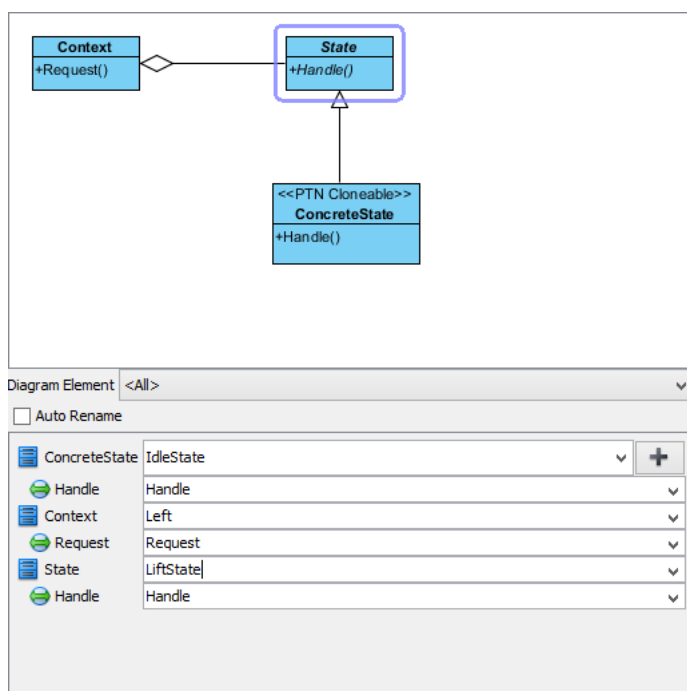
3. Right-click on the class diagram and select **Utilities > Apply Design Pattern...** from the popup menu.



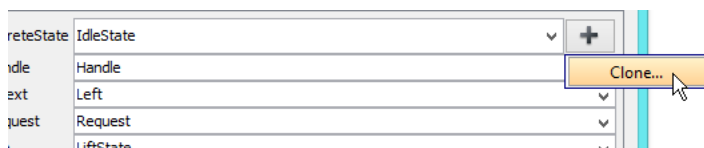
- In the **Design Pattern** dialog box, select *State* from the list of patterns.



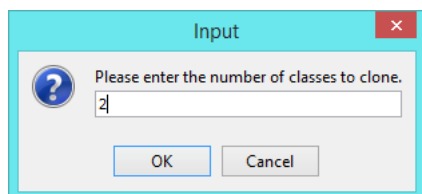
- At the bottom pane, rename *Context*, *State* and *ConcreteState* to *Life*, *LifeState* and *IdleState*.



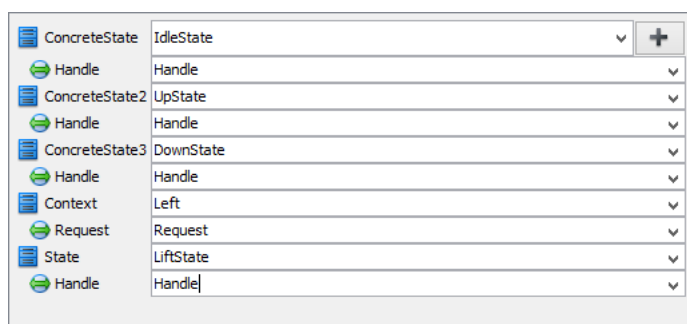
- We need 2 more concrete states for up and down. Click on the + button at the ConcreteState row and select **Clone...** from the popup menu.



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

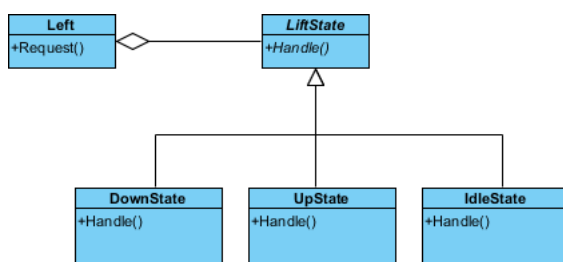


- Rename *ConcreteState2* and *ConcreteState3* to *UpState* and *DownState*.



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

- Tidy up the diagram. Here is result:



Resources

- [Design Patterns.vpp](https://www.designpatterns.com/)

2. [State.pat](#)

Related Links

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



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

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