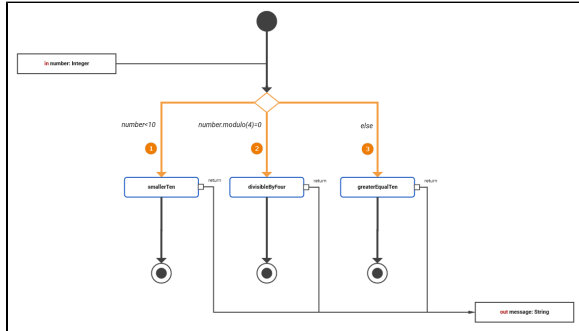


Adding a Decision

Activity diagrams can also implement logic that is based on conditions. You can branch a control flow using the **Decision** element.

The following example shows how to use **decisions** in activity diagrams. The user can enter a positive number. The process will then return a message depending on if the number is smaller or greater than 10 and divisible by 4.



The branching conditions of the decision must evaluate to a **Boolean** value (boolean expression) and be defined on the outgoing control flows of the decision node as a **Guard Expression**. Page [Logical Operators](#) provides a list of all possible logical operators that can be used within a guard expression. You can also use **Boolean** operators (and, or) as described in [Boolean Operators](#).

In the example above, there are three outgoing control flows:

| Nr. | Control Flow | Condition | Guard Expression |
|-----|---------------------------------|----------------------------------|--------------------|
| 1 | Decision smallerTen | entered number smaller than ten | number<10 |
| 2 | Decision divisibleByFour | entered number divisible by four | number.modulo(4)=0 |
| 3 | Decision greaterEqualTen | all other cases | else |

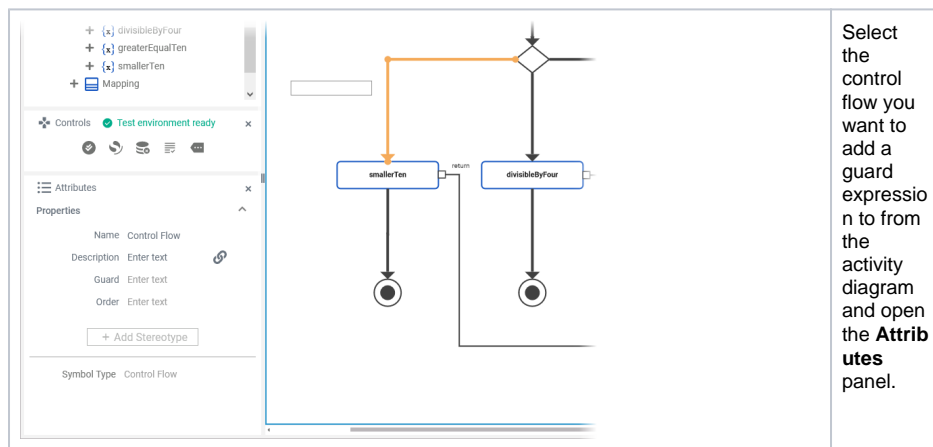
The one or more of the control flows contain the actual condition(s) (1 and 2). Exactly one control flow must contain an `else` expression (3): This control flow is followed if all other expressions evaluate to false.



The boolean operators of the xUML Runtime support short-circuiting . This means that the second operand is evaluated only when the result is not fully determined by the first operand.

Adding a Guard Expression

To add a guard expression to a control flow proceed as follows:



On this Page:

- Adding a Guard Expression
- Specifying an Evaluation Order
 - Examples

Activity_Decision_Example



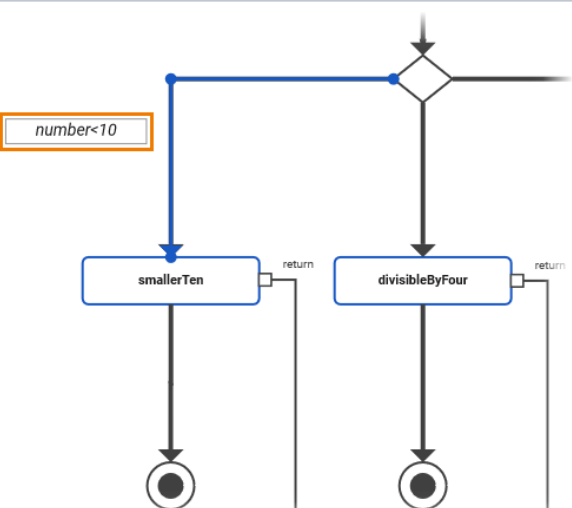
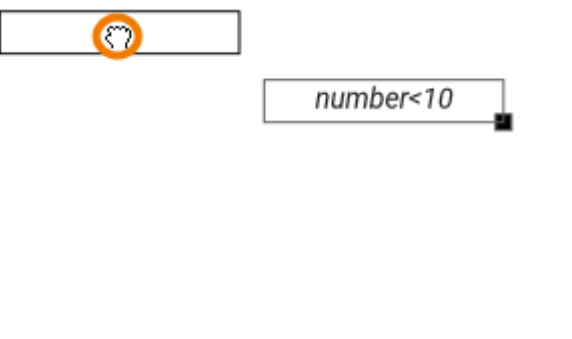
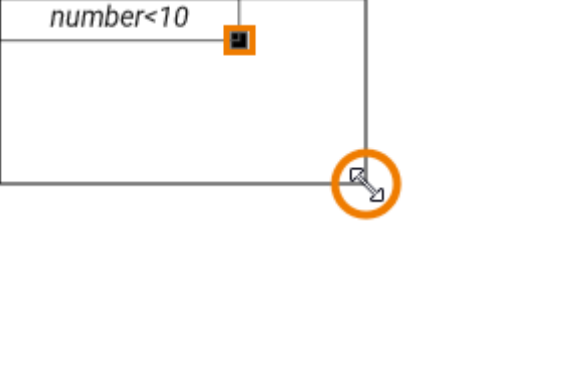
Click the icon to download a simple example model that shows how to use decisions in activity diagrams with **Scheer PAS Designer**.

Related Pages:

- Working with the Activity Editor
- Changing the Attributes of Elements on the Activity Diagram

Related Documentation:

- xUML Services Reference Guide
 - Logical Operators
 - Boolean Operators

| | |
|---|---|
| <div data-bbox="162 136 730 598"> <div> <div>Attributes</div> <div> <div>Properties</div> <div> <div>Name</div> <div>Control Flow</div> </div> <div> <div>Description</div> <div>Enter text</div> </div> <div> <div>Guard</div> <div>number<10</div> </div> <div> <div>Order</div> <div>Enter text</div> </div> <div>+ Add Stereotype</div> </div> <div> <div>Symbol Type</div> <div>Control Flow</div> </div> </div> </div> | <p>Enter a boolean expression into the field Guard Expression.</p> |
|  | <p>The entered expression is also displayed in a box next to the corresponding control flow in the diagram.</p> |
|  | <p>When the guard expression box is selected, you can move it any time.</p> <p>Click the box and drag it to the desired position.</p> |
|  | <p>You can resize the guard expression box by clicking the square in the bottom right corner of the element and dragging it.</p> |

Specifying an Evaluation Order

The order attribute on the decision flow defines the order in which the guards should be evaluated.

To add an order to a control flow proceed as follows:

Attributes

Properties

| Name | Control Flow |
|-------------|--------------|
| Description | Enter text |
| Guard | number<10 |
| Order | Enter text |

Symbol Type Control Flow

```

graph TD
    Start(( )) --> Decision{ }
    Decision -- "number<10" --> smallerTen[smallerTen]
    Decision -- "number.module(4)=0" --> divisibleByFour[divisibleByFour]
    smallerTen -- "return" --> Merge(( ))
    divisibleByFour --> Merge
    Merge --> End(( ))
  
```

Select the control flow you want to add in order to from the activity diagram and open the **Attributes** panel.

Attributes

Properties

| Name | Control Flow |
|-------------|--------------|
| Description | Enter text |
| Guard | number<10 |
| Order | 1 |

Symbol Type Control Flow

Enter the order number you want to assign to the selected control flow.

Examples

The following tables shows some examples regarding the [Designer example mentioned above](#):

| Example | Entered Number | Guard Expression | Condition | Result |
|---------|----------------|--------------------|------------------------------------|--|
| 1 | 7 | number<10 | ✔ entered number smaller than ten | Branch 1 is followed without evaluating the other two branches |
| 2 | 12 | number<10 | ✘ entered number smaller than ten | Branch 2 is followed without evaluating the third branch |
| | | number.modulo(4)=0 | ✔ entered number divisible by four | |
| 3 | 14 | number<10 | ✘ entered number smaller than ten | Branch 3 is followed |
| | | number.modulo(4)=0 | ✘ entered number divisible by four | |
| | | else | ✔ | |