

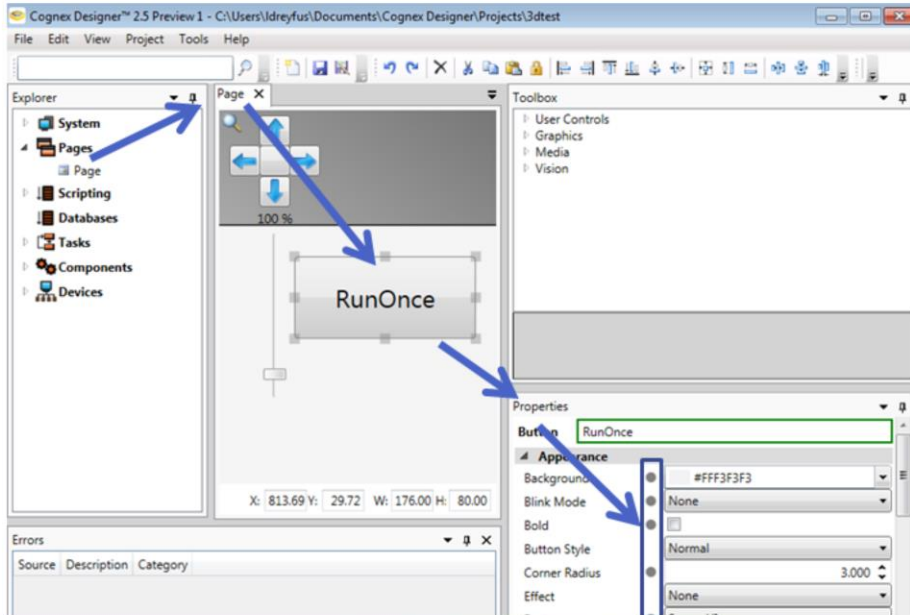
Designer Basic : Expression Builder



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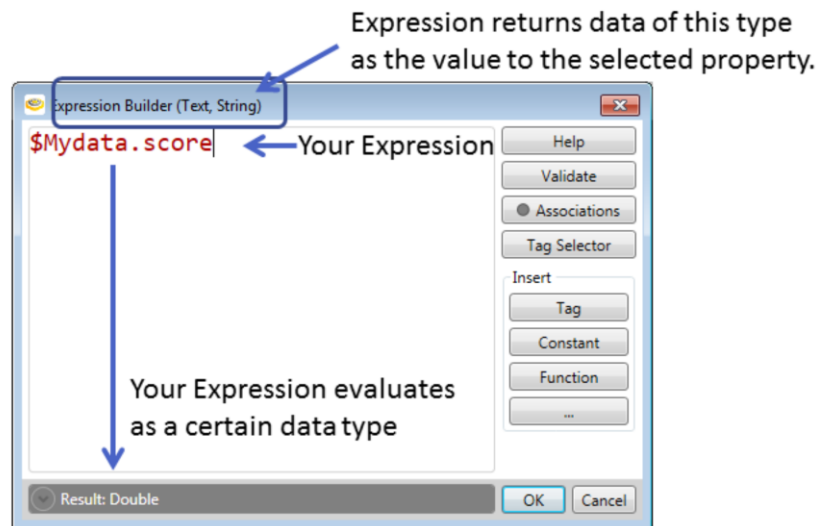
Where is it used?

Expression Builder is found in the HMI section of Designer, in the Properties of UI elements.



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Expression Builder Overview



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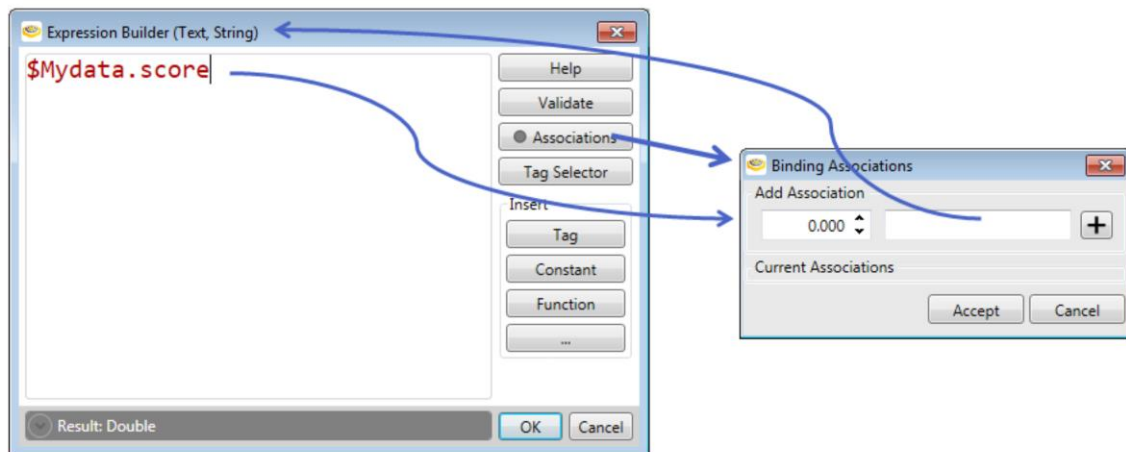
This is the expression Builder up at the top, in the header of the window it shows you the data type the expression is working with. In this case it is of type String.

This means that the little gray circle we clicked on was next to a text field. If it was next to a checkbox this text would read BOOLEAN.

This is your expression. It may not look like much but it outputs a value. In this case the value is a number which is stored in the system as type DOUBLE.

You can see the value type your expression creates at the bottom.

Expression Builder Overview



Once your expression evaluates to a value, you can click the [associations] button to create a binding.

A “binding associations” window pops up.

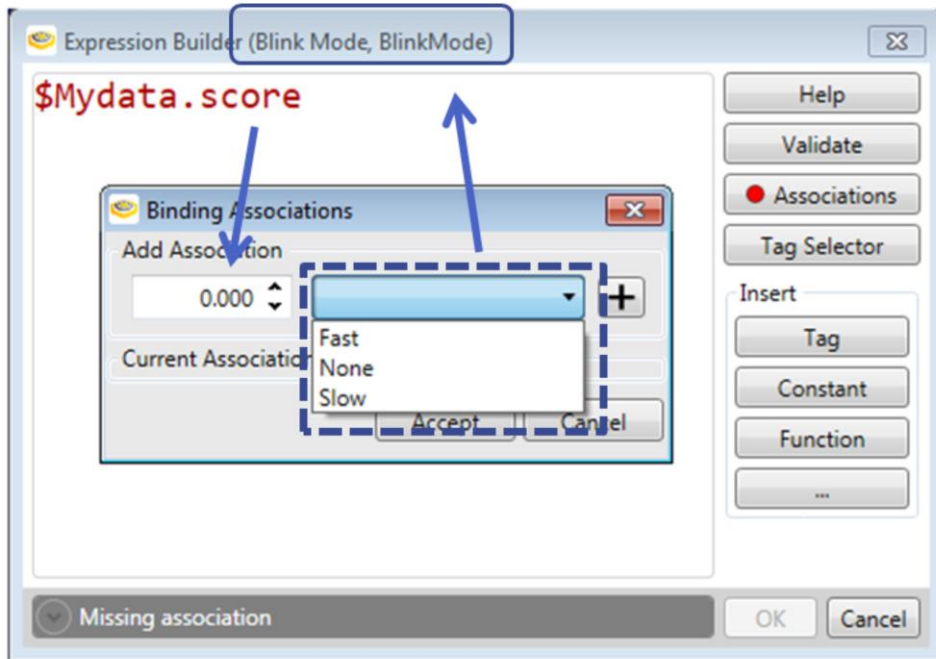
The associated value is based on the possible value of my expression, which relies on the data TYPE to which the expression evaluates. In this case a DOUBLE.

On the right is the value that will be returned by the expression builder. Since it is returning a STRING, you are given a text field into which to type a STRING.

Note the returned data type can be seen at the top of the expression builder window.

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Expression Builder Overview

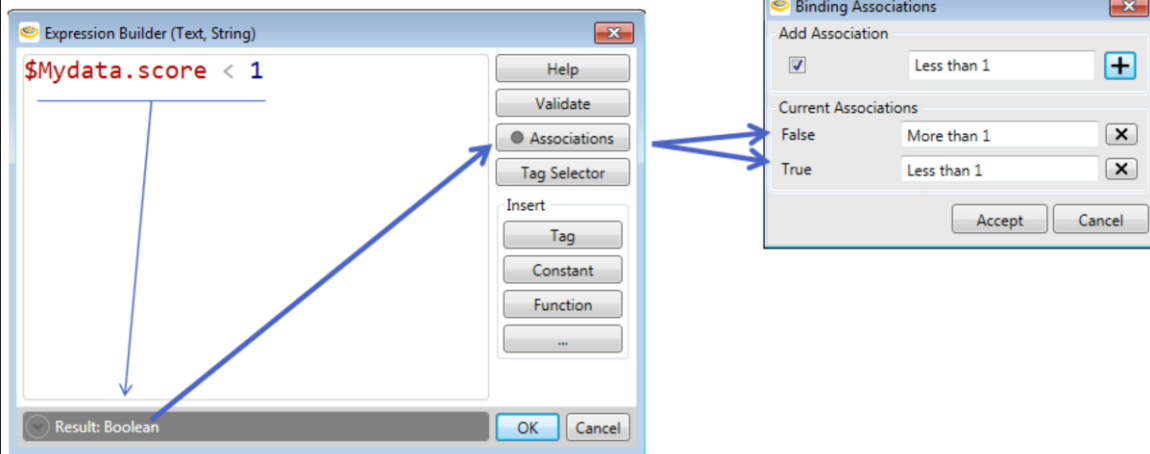


Here we see an example of an expression which changes the blink mode of a UI element.

We can see my score is still a DOUBLE

In the binding associations window we can see that instead of a STRING,
I have a dropdown menu with several options of BLINKMODE.
if score matches the associated value, then the blink rate selected
in the dropdown will be set for the blink rate property of this UI element.

Expression Builder Overview



In this case our expression is a bit different.

We can see that it evaluates as a BOOLEAN.

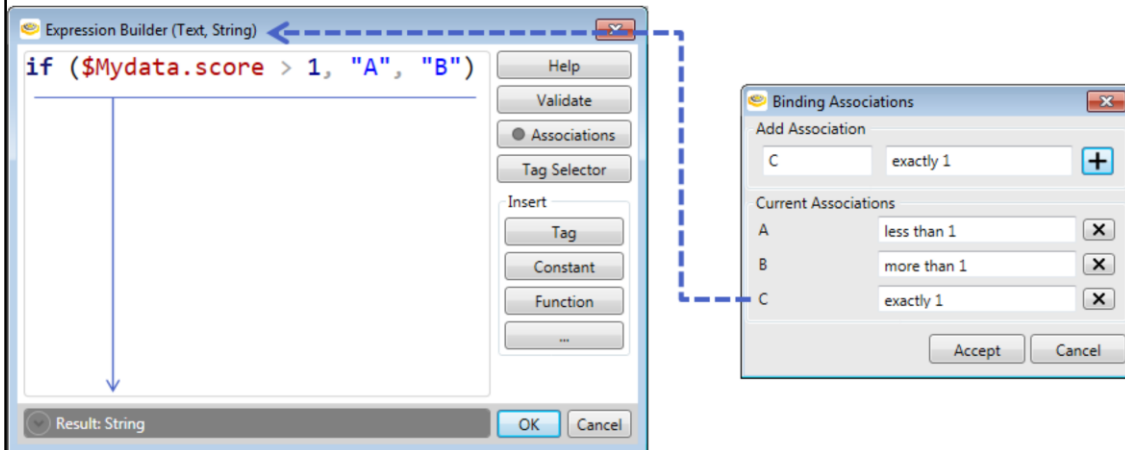
This is because the expression "score is less than 1" is either true or false (a BOOLEAN). While the expression we had earlier "score" could have been .99, .98, etcetera, which is of data type DOUBLE.

We now see that instead of a value option of 0.000 we have a checkbox, which is a BOOLEAN representation of TRUE/FALSE

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Expression Builder Overview



In this case we see a very different looking expression.
This will be familiar to anyone with excel experience.
This type of expression returns the text A if Score is more than 1 (it is text because it is in quotes),
and it returns the text B if score is not more than 1.
Under what conditions will our option C, set up in associations, activate?
This is also an example of how to use an expression to evaluate a DOUBLE and turn it into a TEXT or BOOLEAN value to use in our associations.

SUMMARY

- **Expressions evaluate to a value of a specific data type**
 - (Boolean, Integer, String)
- **Expression Values are then associated with UI property values**
 - (font size, label text, blink rate)
- **You can use an expression turn one data type into another**
 - (DOUBLE into BOOLEAN to make associations easier)