

twoDimensional

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Input

- input1
- input2

Coefficient set

- interpolationType
- extrapolationType
- lookupTable (choice)
 - lookupTableRow
 - locationId / inputParameterId1 / inputParameterId2 / outputParameterId / qualifierId (since 2017.02)

Output

- output

Description

The output will be calculated using a simple table lookup with the input value. The output value will be calculated by interpolation or extrapolation in the lookup table. The type of

interpolation can be configured in the coefficient set with the interpolation type option. The options available are: linear and logarithmic. When the input value is outside the range

of the lookup table the behaviour of the transformation will be determined by the configured extrapolation type. Make sure the input and output values are configured in ascending order.

The options available are:

- notAllowed,
- maxMin,
- linear

If the first option, notAllowed, is configured an input value outside the range will return a missing value. The second option will return the minimum value or the maximum value in the lookup table. The third option linear enables the extrapolation for the function.

input1Unit: unit of the input1 values in the lookup table. When this unit is different from the input parameter unit the input values are converted using the config units configured in the parameters.xml

input2Unit: unit of the input2 values in the lookup table. When this unit is different from the input parameter unit the input values are converted using the config units configured in the parameters.xml

outputUnit: unit of the output values in the lookup table. When this unit is different from the output parameter unit the output values are converted using the config units configured in the parameters.xml

Lookup using table directly specified in transformation config

config example lookupTableRow

```
<transformation id="2dTableTest">
  <lookup>
    <twoDimensionalLookup>
      <input1>
        <variableId>H1</variableId>
      </input1>
      <input2>
        <variableId>H2</variableId>
      </input2>
      <coefficientSet>
        <interpolationType>linear</interpolationType>
        <extrapolationType>extrapolate</extrapolationType>
        <input1Unit>cm</input1Unit>
        <input2Unit>dm</input2Unit>
        <outputUnit>mm</outputUnit>
        <lookupTable>
          <lookupTableRow input1="0" input2="0" output="1000"/>
          <lookupTableRow input1="0" input2="20" output="2000"/>
          <lookupTableRow input1="200" input2="0" output="0"/>
          <lookupTableRow input1="200" input2="40" output="4000"/>
          <lookupTableRow input1="300" input2="0" output="0"/>
          <lookupTableRow input1="300" input2="80" output="16000"/>
        </lookupTable>
      </coefficientSet>
      <output>
        <variableId>H3</variableId>
      </output>
    </twoDimensionalLookup>
  </lookup>
</transformation>
```

Lookup using LookupTables.xml from RegionConfigFiles

Since 2017.02 it is possible to use LookupTables.xml from RegionConfig by referencing with locationId, inputParameterId & outputParameterId

config example lookup from LookupTables.xml in RegionConfigFiles

```
<transformation id="2dTableTest">
  <lookup>
    <twoDimensionalLookup>
      <input1>
        <variableId>scalar1</variableId>
      </input1>
      <input2>
        <variableId>scalar2</variableId>
      </input2>
      <coefficientSet>
        <interpolationType>linear</interpolationType>
        <extrapolationType>extrapolate</extrapolationType>
        <lookupTable>
          <piTable>
            <locationId>H-2001</locationId>
            <inputParameterId1>H.m</inputParameterId1>
            <inputParameterId2>H.updated</inputParameterId2>
            <outputParameterId>H.obs</outputParameterId>
          </piTable>
        </lookupTable>
      </coefficientSet>
      <output>
        <variableId>scalar3</variableId>
      </output>
    </twoDimensionalLookup>
  </lookup>
</transformation>
```

Example LookupTables.xml from RegionConfigFiles

```
<?xml version="1.0" encoding="UTF-8"?>
<Tables xmlns="http://www.wldelft.nl/fews/PI" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.wldelft.nl/fews/PI http://fews.wldelft.nl/schemas/version1.0/pi-schemas
/pi_tables.xsd">
  <table>
    <header>
      <locationId>H-2001</locationId>
      <qualifierId>Plant Power Table</qualifierId>
      <a parameterId="H.m" units="m"/>
      <b parameterId="H.obs" units="m"/>
      <c parameterId="H.updated" units="m"/>
      <d parameterId="HU.Total" units=""/>
      <e parameterId="HU.Last" units=""/>
      <startDate date="2013-01-02" time="00:00:00"/>
    </header>
    <table>
      <row a="39" b="0" c="0" d="0" e="0"/>
      <row a="39" b="6.901" c="20" d="1" e="0"/>
      <row a="39" b="13.802" c="39.93099" d="2" e="0"/>
      <row a="39" b="20.703" c="59.79297" d="3" e="0"/>
      <row a="39" b="27.604" c="79.58594" d="4" e="0"/>
      <row a="39" b="34.505" c="99.3099" d="5" e="0"/>
      <row a="39" b="61.876497" c="154.2" d="6" e="0"/>
      <row a="40" b="0" c="0" d="0" e="0"/>
      <row a="40" b="6.881" c="20.5" d="1" e="0"/>
      <row a="40" b="13.762" c="40.93119" d="2" e="0"/>
      <row a="40" b="20.643" c="61.29357" d="3" e="0"/>
      <row a="40" b="27.524" c="81.58714" d="4" e="0"/>
      <row a="40" b="34.405" c="101.8119" d="5" e="0"/>
      <row a="40" b="61.312647" c="158.6" d="6" e="0"/>
      <row a="41" b="0" c="0" d="0" e="0"/>
      <row a="41" b="6.863" c="21" d="1" e="0"/>
      <row a="41" b="13.726" c="41.93137" d="2" e="0"/>
      <row a="41" b="20.589" c="62.79411" d="3" e="0"/>
      <row a="41" b="27.452" c="83.58822" d="4" e="0"/>
      <row a="41" b="34.315" c="104.3137" d="5" e="0"/>
      <row a="41" b="60.815997" c="163" d="6" e="0"/>
    </table>
  </table>
</Tables>
```

inputParameterId1 must always be 'a'. The other parameters can be either inputParameterId2 or outputParameter

When 'c' needs to be looked up by 'a' and 'b' ->

```
<locationId> of the PiTable
<inputParameterId1> => 'a', the domain parameter
<inputParameterId2> => 'b',
<outputParameterId> => 'c'
```

When 'b' needs to be looked up by 'a' and 'c' ->

```
<locationId> of the PiTable
<inputParameterId1> => 'a', the domain parameter
<inputParameterId2> => 'c',
<outputParameterId> => 'b'
```