

**threshold**

<b>keys:</b>	<b>[from]</b>	<b>&lt;number&gt;</b>	source picture
	<b>[to]</b>	<b>&lt;number&gt;</b>	destination picture
	<b>ge</b>	<b>&lt;n1&gt;...&lt;n9&gt;</b>	lower threshold(s) (including threshold value)
	<b>gt</b>	<b>&lt;n1&gt;...&lt;n9&gt;</b>	lower threshold(s) (excluding threshold value)
	<b>le</b>	<b>&lt;n1&gt;...&lt;n9&gt;</b>	upper threshold(s) (including threshold value)
	<b>lt</b>	<b>&lt;n1&gt;...&lt;n9&gt;</b>	upper threshold(s) (excluding threshold value)

You use **threshold** to produce a binary image according to one or more intensity thresholds. If no threshold values are specified, the mid-range intensity value for the source picture is used as a lower limit for thresholding.

**Examples**

```
threshold
```

This command converts the current picture into a binary image where non-zero pixels represent source pixels with value greater than or equal to the mid-range value for the source picture.

```
threshold 2:3 2:4 ge i1 le i2
```

This command thresholds picture 2:3 for intensities in the range i1 to i2.

```
threshold 99 ge 70,50,50,10,90 le 20,40,60,100,80
```

This command thresholds picture 99 for intensity bands 10 to 20, 30 to 40, 50 to 60, 70 to 80 and 90 to 100 (note how values have been sorted into the correct sequence).

```
threshold lt -35 gt 35
```

This command thresholds the current picture for all pixels with absolute value greater than 35.

**Description**

You use the multi-valued keys **ge** or **gt** to specify lower threshold limits and the **le** or **lt** key to specify upper limits. Up to 9 upper and 9 lower limits may be specified. The limits are sorted into adjacent pairs and a check is made to ensure that they are consistent with each other, e.g.

```
ge 10,20 lt 30
```

would be faulted because the lower limit of 10 does not pair up with an upper limit (or plus infinity).

## threshold

On the other hand the limits

```
ge 20 lt 10 le 30
```

are valid, specifying intensity bands less than 10 and 20 to 30.

Threshold values should be specified in adjacent pairs with the exception of a single, isolated upper or lower limit. The ordering of the **ge**, **gt**, and **le** and **lt** keys on the command line does not matter as they are sorted into numerical order before being checked for consistency.

### Notes

see also: **calculate**

### Defaults and Ranges

keys/options	defaults	range
[from]	current picture, held in the variable <i>select</i>	valid picture number
[to]	source picture	valid picture number
<b>ge</b>	middle of source picture range	real number
<b>gt</b>	<i>none</i>	real number
<b>le</b>	<i>none</i>	real number
<b>lt</b>	<i>none</i>	real number