

# Aa Labels

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*Version 1.2.0, by Giorgio Bianchini*

**Description:** Draws labels on nodes, tips or branches.

**Module type:** Plotting

**Module ID:** `ac496677-2650-4d92-8646-0812918bab03`

This module is used to draw labels showing the value of an attribute. The labels can be anchored based on the position of nodes and branches.

## Parameters

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### Show on

**Control type:** Drop-down list

**Default value:** Leaves

**Possible values:**

- Leaves
- Internal nodes
- All nodes

This parameter determines on which nodes the label is shown. If the value is `Leaves`, the label is only shown for terminal nodes (nodes with no child nodes). If the value is `Internal nodes` the label is shown only for internal nodes (nodes which have at least one child). If the value is `All nodes`, labels are shown for both leaves and internal nodes.

### Exclude cartoon nodes

**Control type:** Check box

**Default value:** Checked

This parameter determines whether labels are shown for nodes which have been "cartooned" or collapsed. If the check box is checked, labels are not shown for nodes that have been "cartooned".

### Anchor

**Control type:** Drop-down list

**Default value:** Node

## Possible values:

- Node
- Mid-branch
- Centre of leaves
- Origin

This parameter determines the anchor for the labels. If the value is `Node`, the mid-left of each label is anchored to the corresponding node. If the value is `Mid-branch`, the mid-centre of the label is aligned with the midpoint of the branch connecting the node to its parent. If the value is `Centre of leaves` or `Origin`, the alignment depends on the value of the [Branch reference](#):

Branch reference	Centre of leaves	Origin
Rectangular	The smallest rectangle containing all the leaves that descend from the current node is computed. The anchor corresponds to the centre of this rectangle.	A point corresponding to the projection of the node on a line perpendicular to the direction in which the tree expands and passing through the root node. Usually (i.e. if the tree is horizontal), this means a point with the same horizontal coordinate as the root node and the same vertical coordinate as the current node.
Radial	The smallest rectangle containing all the leaves that descend from the current node is computed. The anchor corresponds to the centre of this rectangle.	The root node.
Circular	The centre of leaves is computed using polar coordinates: the minimum and maximum distance of the leaves that descend from the current node are computed, as well as the minimum and maximum angle. The anchor has a distance corresponding to the average of the minimum and maximum distance, and an angle corresponding to the average of the maximum and minimum angle.	The root node.

## Position

**Control type:** Point

**Default value:** ( 5, 0 )

This parameter determines how shifted from the anchor point the label is. The `x` coordinate corresponds to the line determined by the [Orientation](#) with respect to the [Reference](#); the `y` coordinate corresponds to the line perpendicular to this.

## Alignment

**Control type:** Drop-down list

**Default value:** Default

**Possible values:**

- Default
- Outwards
- Center
- Inwards

## Orientation

**Control type:** Slider

**Default value:** 0°

**Range:** [ 0°, 360° ]

This parameter determines the orientation of the label with respect to the [Reference](#), in degrees. If this is `0°`, the label is parallel to the reference (e.g. the branch), if it is `90°` it is perpendicular to the branch and so on.

## Reference

**Control type:** Drop-down list

**Default value:** Branch

**Possible values:**

- Horizontal
- Branch

This parameter (along with the [Orientation](#)) determines the reference for the direction along which the text of the label flows. If this is `Horizontal`, the labels are all drawn in the same direction, regardless of the orientation of the branch to which they refer. If it is `Branch`, each label is drawn along the direction of the branch connecting the node to its parent, assuming that the branch is drawn in the style determined by the [Branch reference](#).

## Branch reference

**Control type:** Drop-down list

**Default value:** Rectangular

**Possible values:**

- Rectangular
- Radial
- Circular

This parameter determines the algorithm used to compute branch orientations. For best results, the value of this parameter should correspond to the coordinates module actually used.

## Font

**Control type:** Font

**Default value:** Helvetica 10pt

This parameter determines the font (font family and size) used to draw the labels.

## Auto colour by node

**Control type:** Check box

**Default value:** Unchecked

If this check box is checked, the colour of each label is determined algorithmically in a pseudo-random way designed to achieve an aesthetically pleasing distribution of colours, while being reproducible if the same tree is rendered multiple times.

## Opacity

**Control type:** Slider


**Default value:** 100 %

**Range:** [ 0 %, 100 % ]

This parameter determines the opacity of the colour used if the [Auto colour by node](#) option is enabled.

## Text colour

**Control type:** Colour (by node)

**Default value:**  #000000 (opacity: 100%)

**Default attribute:** `Color`

This parameter determines the colour used to draw each label (if the [Auto colour by node](#) option is disabled). The colour can be determined based on the value of an attribute of the nodes in the tree. For nodes that do not possess the specified attribute (or that have the attribute with an invalid value), a default value is used. The default attribute used to determine the colour is `Color`.

## Auto background by node

**Control type:** Check box

**Default value:** Unchecked

If this check box is checked, the background of each label is determined algorithmically in a pseudo-random way designed to achieve an aesthetically pleasing distribution of colours, while being reproducible if the same tree is rendered multiple times.

## Background opacity

**Control type:** Slider


**Default value:** 100 %

**Range:** [ 0 %, 100 % ]

This parameter determines the opacity of the colour used if the [Auto background by node](#) option is enabled.

## Background colour

**Control type:** Colour (by node)

**Default value:**  #000000 (opacity: 0%)

**Default attribute:** `BackgroundColour`

This parameter determines the colour used to draw the background of the label (if the [Auto background by node](#) option is disabled). The colour can be determined based on the value of an attribute of the nodes in the tree. For nodes that do not possess the specified attribute (or that have the attribute with an invalid value), a default value is used. The default attribute used to determine the colour is `BackgroundColour`.

## Margin

**Control type:** Point

**Default value:** ( 5, 2 )

This parameter determines the margin between the label and the background (if the [Fixed size](#) option is disabled).

## Fixed size

**Control type:** Check box

**Default value:** Unchecked

## Width

**Control type:** Number spin box (by node)

**Default value:** 50

**Range:** [ 0,  $+\infty$  )

**Default attribute:** `LabelWidth`

This parameter determines the width of the label background (if the [Fixed size](#) option is disabled).

## Height

**Control type:** Number spin box (by node)

**Default value:** 14

**Range:** [ 0,  $+\infty$  )

**Default attribute:** `LabelHeight`

This parameter determines the height of the label background (if the [Fixed size](#) option is disabled).

## Border thickness

**Control type:** Number spin box (by node)

**Default value:** 0

**Range:** [ 0,  $+\infty$  )

**Default attribute:** `BorderThickness`

This parameter determines the thickness of the border around the label.

## Auto border by node

**Control type:** Check box

**Default value:** Checked

If this check box is checked, the colour for the border of each label is determined algorithmically in a pseudo-random way designed to achieve an aesthetically pleasing distribution of colours, while being reproducible if the same tree is rendered multiple times.

## Border opacity

**Control type:** Slider


**Default value:** 100 %

**Range:** [ 0 %, 100 % ]

This parameter determines the opacity of the colour used if the [Auto border by node](#) option is enabled.

## Border colour

**Control type:** Colour (by node)


**Default value:**  #000000 (opacity: 100%)

**Default attribute:** `BorderColour`

This parameter determines the colour used to draw the border of the label (if the [Auto border by node](#) option is disabled). The colour can be determined based on the value of an attribute of the nodes in the tree. For nodes that do not possess the specified attribute (or that have the attribute with an invalid value), a default value is used. The default attribute used to determine the colour is `BorderColour`.

## Border style

**Control type:** Line dash

**Default value:** 

- *Units on:* 0
- *Units off:* 0
- *Phase:* 0

The line dash to use when drawing the borders.

## Line join

**Control type:** Drop-down list

**Default value:** Round

**Possible values:**

- Miter
- Round
- Bevel

The line join to use at the corners of the border.

## Attribute

**Control type:** Attribute selector

**Default value:** Name

This parameter specifies the attribute used to determine the text of the labels. By default the `Name` of each node is drawn.

## Attribute type

**Control type:** Attribute type

**Default value:** String

**Possible values:**

- String
- Number

This parameter specifies the type of the attribute used to determine the text of the labels. By default this is `String`. If the type chosen here does not correspond to the actual type of the attribute (e.g. `Number` is chosen for the `Name` attribute, or `String` is chosen for the `Length` attribute), no label is drawn. If the attribute has values with different types for different nodes, the label is only shown on nodes whose attribute type corresponds to the one chosen here.

## Attribute format

**Control type:** Attribute formatter

This parameter determines how the value of the selected attribute is used to determine the text of the label. By default, if the [Attribute type](#) is `String` the text of the label corresponds to the value of the attribute, while if the [Attribute type](#) is `Number` the text of the label corresponds to the number rounded to 2 significant digits.

## Further information

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This module can be used to draw labels on the tree with a high degree of customisability. For example, labels can be used to show taxon names on the tips of the tree, branch lengths on the branches and support values at internal nodes. The labels can be anchored in multiple ways to obtain different effects.

A limitation is that all the labels drawn by an instance of this module must use the same font, anchor and shift from the anchor point; thus, if different nodes require different values for these properties, a different module needs to be added for each of them.