pascaltriangle 宏包 ⟹ English Version

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Contents

*https://github.com/registor/pascaltriangle

†https://gitee.com/nwafu_nan/pascaltriangle

1 引言

pascaltriangle 是一个基于 TikZ 用 expl3 开发的 Pascal 三角形 (杨辉三角形) 生成宏包，它提供了一个唯一的绘图命令 \pascal，并可以通过不同命令的命令选项或\pascalset命令设置生成不同外观的等腰或直角 Pascal 三角形。

2 用户接口

2.1 \pascal绘图命令

\pascal `\pascal [⟨外观选项⟩] {⟨层数⟩}`

用于绘制一个 Pascal 三角形。

该命令仅有一个必选参数 {⟨层数⟩}，用于指定 Pascal 三角形的层数。

在 [⟨外观选项⟩] 中可以通过 key-value 方式设置三角形形状、大小等外观。

三角形的外观也可以通过\pascalset命令的逗号分隔 key-value 列表进行设置

2.2 \pascalset

\pascalset `\pascalset {⟨外观选项⟩}`

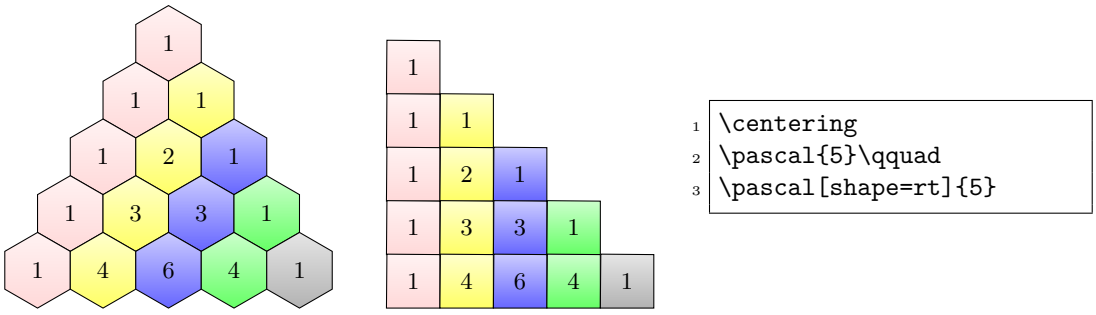
用于设置一个 Pascal 三角形的外观。

在 {⟨外观选项⟩} 中可以通过 key-value 方式设置三角形形状、大小等外观。

3 外观选项

shape = ⟨形状⟩ (initially iso)

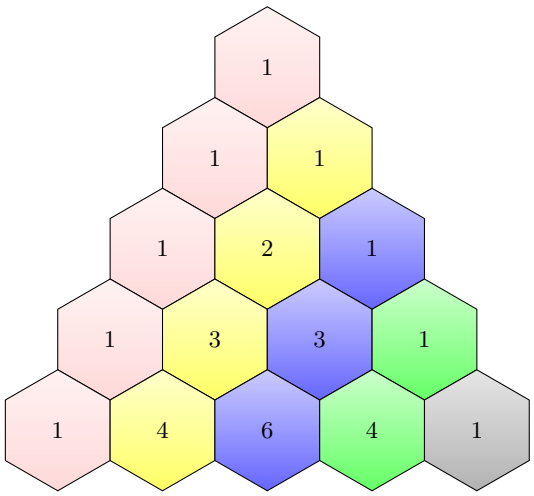
设置 Pascal 三角形的形状，目前支持iso—等腰三角形和 rt—直角三角形。




```
\centering
\pascal{5}\qquad
\pascal[shape=rt]{5}
```

radius = ⟨半径⟩ (initially 0.5cm)

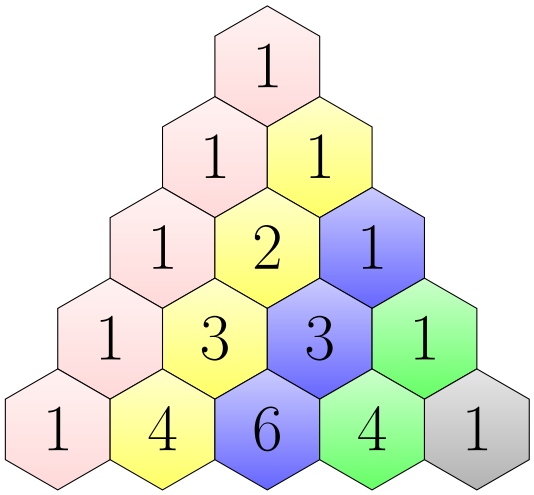
设置三角形每个单元外接圆半径，注意需要带有单位。



```
\centering
\pascal[radius=0.8cm]{5}
```

`fontsize` = ⟨字号命令⟩ (initially `\small`)

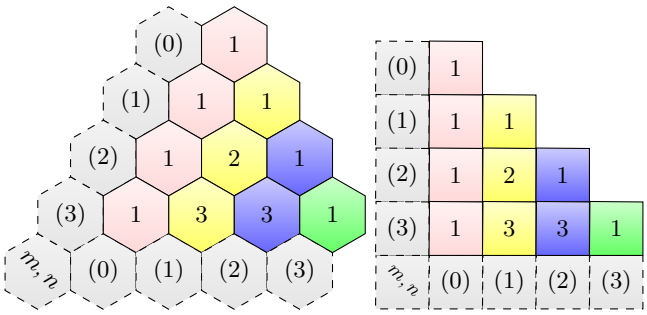
设置三角形每个单元中数字文本大小。



```
\centering
\pascal[radius=0.8cm,
  fontsize=\Huge]{5}
```

`withnum` = ⟨布尔值⟩ (initially `false`)

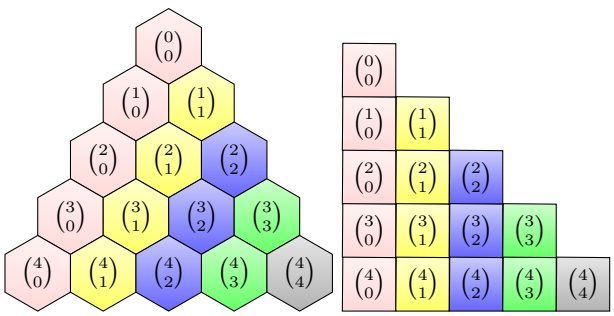
设置是否显示 Pascal 三角形的行列编号。



```
\centering
\pascal[withnum]{4}
\pascal[withnum,shape=rt]{4}
```

`binom` = ⟨布尔值⟩ (initially `false`)

设置是否显示用二项式表达式显示各元素值。



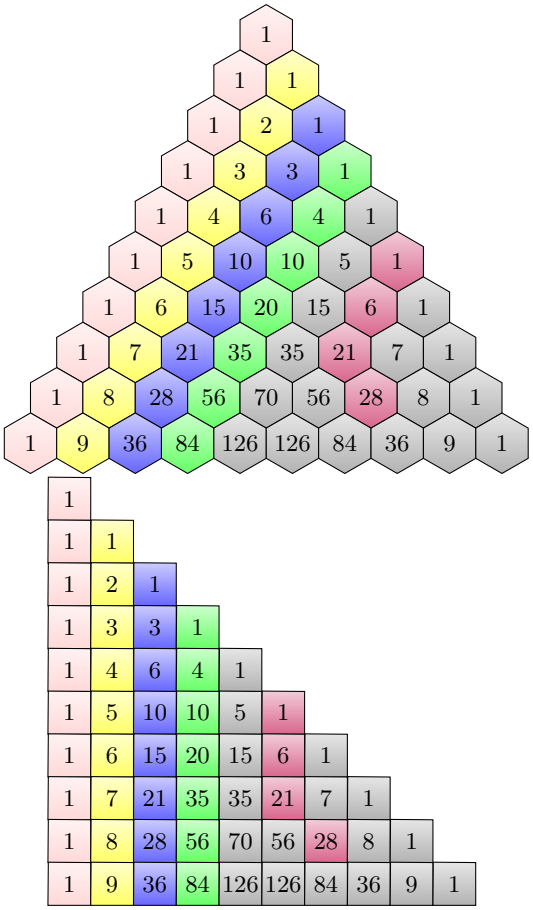
```
\centering
\pascal[binom]{5}
\pascal[binom,shape=rt]{5}
```

`fillr` = ⟨整数⟩ (initially 1)

设置需要表示前列累加的单元格行号，注意行号是当前列自顶向下从 0 开始计数。

`fillc` = ⟨整数⟩ (initially 1)

设置需要表示前列累加的单元格列号，注意列号是自左向右从 0 开始计数。




```
\centering
\pascalset{fillr=2,fillc=6,
           radius=0.4cm}
\pascal{10}\\
\pascal[shape=rt]{10}
```

Package pascaltriangle

⟹ 中文版本

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January 28, 2022 v1.0.1 *†

4 Introduction

pascaltriangle is a Pascal triangle(Yanghui triangle) generation package based on TikZ developed in expl3, which provides a unique drawing command \pascal, and can be set by different options or \pascalset macro to generates isosceles or right-angle Pascal triangles with different appearances.

5 Interfaces

5.1 \pascal macro

\pascal `\pascal [⟨options⟩] {⟨order⟩}`

Used to draw a Pascal triangle.

This macro has only one mandatory parameter {⟨order⟩}, which specifies the number of layers of the Pascal triangle.

In [⟨options⟩] you can set the appearance of the triangle shape, size, etc. by key-value method.

The appearance of the triangle can also be set via the comma-separated key-value list of the \pascalset macro

5.2 \pascalset macro

\pascalset `\pascalset {⟨options⟩}`

Used to set the appearance of Pascal triangle.

In [⟨options⟩] you can set the appearance of the triangle shape, size, etc. by key-value method.

*https://github.com/registor/pascaltriangle
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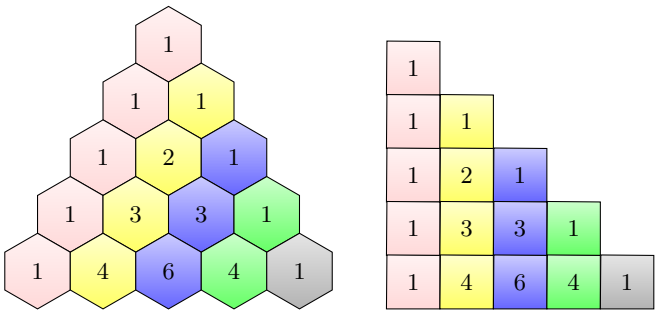
6 options

`shape` = ⟨*shape*⟩ (initially `iso`)

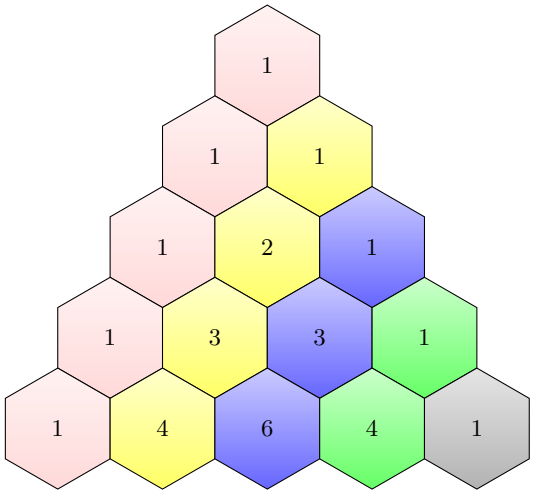
Sets the shape of Pascal triangle currently supporting `iso`—isosceles triangles and `rt`—right-angle triangles.




```
\centering
\pascal{5}\qquad
\pascal[shape=rt]{5}
```

`radius` = ⟨*radius*⟩ (initially `0.5cm`)

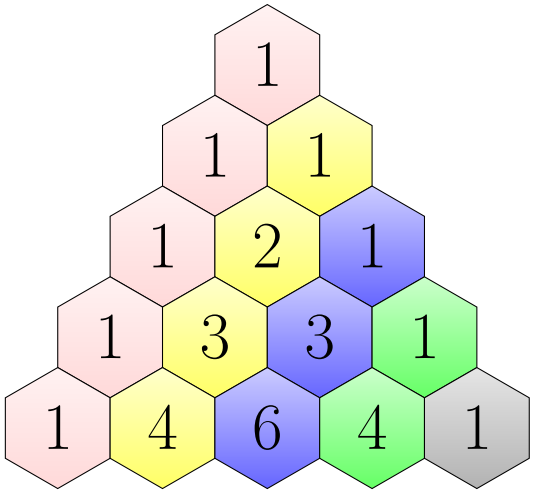
Set the radius of the outer circle of each cell of the triangle, note that it needs to have units.




```
\centering
\pascal[radius=0.8cm]{5}
```

`fontsize` = ⟨*fontsize*⟩ (initially `\small`)

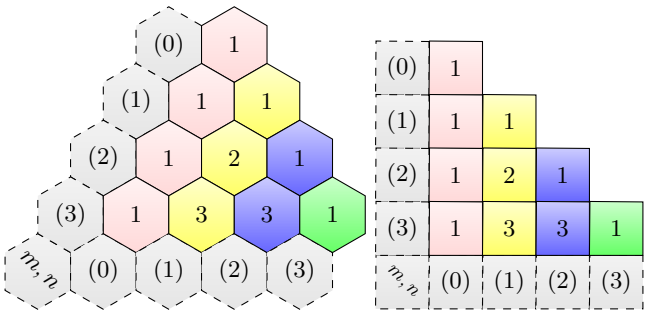
Sets the fontsize of each cell of the triangle.




```
\centering
\pascal[radius=0.8cm,
  fontsize=\Huge]{5}
```

`withnum` = ⟨*bool*⟩ (initially `false`)

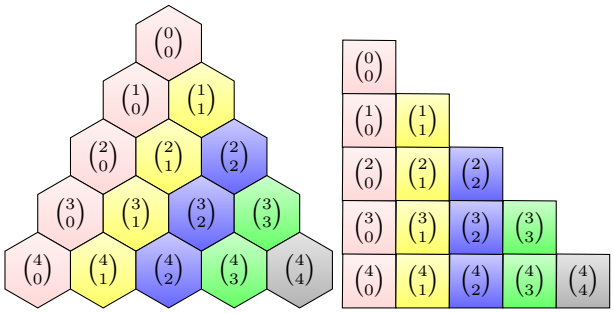
Sets whether to show the Pascal triangle row/col numbers or not.




```
\centering
\pascal[withnum]{4}
\pascal[withnum,shape=rt]{4}
```

`binom` = ⟨*bool*⟩ (initially false)

Sets whether to show each element value with binomial expressions or not.



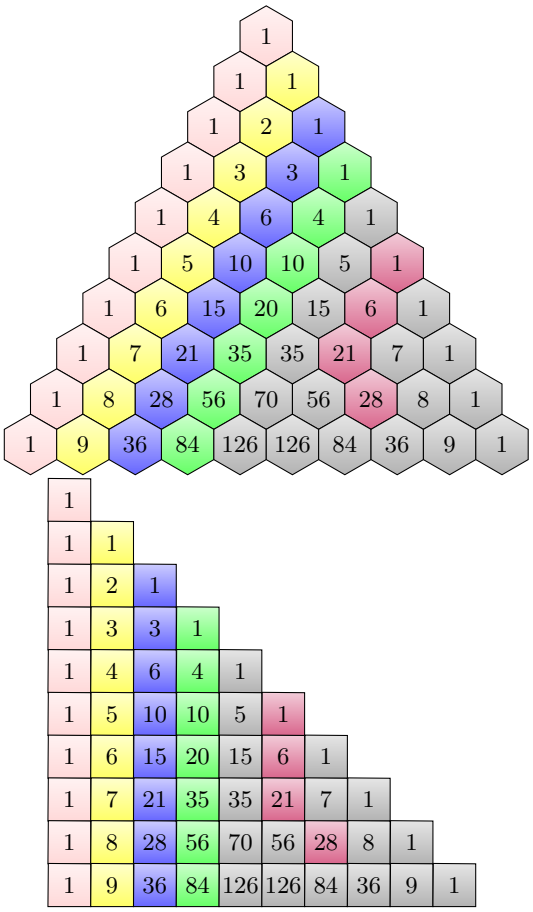
```
\centering
\pascal[binom]{5}
\pascal[binom,shape=rt]{5}
```

`fillr` = ⟨*integer*⟩ (initially 1)

Set the row number of the cell that needs to indicate the sum of the pre-column, note that the row number is in the current column counted from the top down based 0.

`fillc` = ⟨*integer*⟩ (initially 1)

Set the col number of the cell that needs to indicate the sum of the pre-column, note that the col number is counted from the left to right based 0.




```
\centering
\pascalset{fillr=2,fillc=6,
           radius=0.4cm}
\pascal{10}\\
\pascal[shape=rt]{10}
```

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The italic numbers denote the pages where the corresponding entry is described, numbers underlined point to the definition, all others indicate the places where it is used.