The fusioncategories package*

Jacob C. Bridgeman
jcbridgeman.github.io
jcbridgeman1@gmail.com

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Abstract

The fusioncategories package is a package for typesetting fusion category data. This document provides a brief overview of the pacakge and its features.

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*This document corresponds to fusioncategories v0.1.2, dated 2024-07-30.

The **fusioncategories** package

1 Options

`delimiter` `delimiter = {`⟨*delimiter*⟩`}`
`default: ,`

Sets the delimiter for the subscripts, superscripts, left indices, and right indices.

`style` `style =` ⟨*style*⟩ `- {graphical,traditional,compact}`

Sets the style for symbol indices. The default style is `graphical`, which places the indices in a style mimiciking their location on a string diagram. The `traditional` style places the indices in a more traditional style, and the `compact` style places the indices with left indices at the bottom and right indices at the top.

2 Commands

`\NewSymbol` `\RenewSymbol` `\ProvideSymbol` `\DeclareSymbol`

`\NewSymbol[`⟨*Symbol text*⟩`]{`⟨*Symbol name*⟩`}{`⟨*subscripts?*⟩`}{`⟨*superscripts?*⟩`}{`⟨*left indices?*⟩`}{`⟨*right indices?*⟩`}`

Creates a new symbol command with the specified argument types. For example:

`\NewSymbol{N}{true}{true}{}{}` creates the command:
`\NSymbol`, which can be used as follows:
`\NSymbol{a,b}{c}` produces: N^{c}_{ab}.

`\NewSymbol[\tilde{X}]{tX}{true}{}{}{true}` creates the command:
`\tXSymbol`, which can be used as follows:
`\tXSymbol{a,b}{\mu}` produces: $\left[\tilde{X}_{ab}\right]_{\mu}$.

`\NewSymbol{\Gamma}{true}{}{}{}` creates the command:
`\GammaSymbol`, which can be used as follows:
`\GammaSymbol{a,b}` produces: Γ_{ab}.

Arguments that are wanted should marked with `1` or `true`, and arguments that are not wanted must be left blank or marked with `false`.

All commands created with `\NewSymbol` also accept an optional star argument to place an overline over the symbol.

`\NewSymbol` will only create a new symbol command if the command does not already exist, otherwise it will throw an error.

`\RenewSymbol` will overwrite an existing symbol command with the same name. If the command does not exist, it will throw an error.

`\ProvideSymbol` will create a new symbol command if the command does not already exist, otherwise it will do nothing.

`\DeclareSymbol` will create a new symbol regardless of whether the command already exists. If the command already exists, it will overwrite the existing command without warning.

`\NSymbol` `\NSymbol`⟨`*`⟩`{`⟨*subscripts*⟩`}{`⟨*superscripts*⟩`}`

Produces a symbol with the specified subscripts and superscripts.

`\NSymbol{a,b}{c}` produces: N^{c}_{ab}.

`\XSymbol` `\XSymbol`⟨`*`⟩`{`⟨*subscripts*⟩`}{`⟨*superscripts*⟩`}{`⟨*right indices*⟩`}`

Produces a symbol with the specified subscripts, superscripts, and right indices.

`\XSymbol{a,b}{c}{\alpha}` produces: $\left[X^{c}_{ab}\right]_{\alpha}$.

`\FSymbol` `\FSymbol⟨*⟩{⟨subscripts⟩}{⟨superscripts⟩}{⟨left indices⟩}{⟨right indices⟩}`

Produces a symbol with the specified subscripts, superscripts, left indices, and right indices.

`\FSymbol{a,b,c}{d}{\alpha,e,\beta}{\mu,f,\nu}` produces: ${}^{\beta}_{e}{}_{\alpha}\left[F^{d}_{abc}\right]^{\nu}_{f}{}_{\mu}$.

`\FSymbol*{a,b,c}{d}{\alpha,e,\beta}{\mu,f,\nu}` produces: ${}^{\beta}_{e}{}_{\alpha}\left[\overline{F^{d}_{abc}}\right]^{\nu}_{f}{}_{\mu}$.

`\RSymbol` `\RSymbol⟨*⟩{⟨subscripts⟩}{⟨superscripts⟩}{⟨left indices⟩}{⟨right indices⟩}`

Produces a symbol with the specified subscripts, superscripts, left indices, and right indices.

`\RSymbol{a,b}{c}{\alpha}{\beta}` produces: ${}_{\alpha}\left[R^{c}_{ab}\right]_{\beta}$.

`\PentagonEquation` `\PentagonEquation⟨*⟩[⟨a⟩][⟨b⟩][⟨c⟩][⟨α⟩][⟨β⟩][⟨γ⟩]`

Typesets the pentagon equation for a fusion category. If the optional $*$ argument is used, the equation is typeset for the multiplicity free case.

The optional arguments a, b, c, α, β, and γ are used to specify the symbols used in the equation. If these arguments are left blank, the default symbols are used.

`\PentagonEquation*` produces:

$$ {}_{a_5}\left[F^{a_4}_{a_0a_1c_0}\right]_{c_1a_6}\left[F^{a_4}_{a_5a_2a_3}\right]_{c_0} = \sum_{b_0} {}_{a_5}\left[F^{a_6}_{a_0a_1a_2}\right]_{b_0a_6}\left[F^{a_4}_{a_0b_0a_3}\right]_{c_1b_0}\left[F^{c_1}_{a_1a_2a_3}\right]_{c_0}. $$

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Change History

v0.1.0
General: Initial version 1
v0.1.1
General: Added support for Greek letters and command names being different from the symbol text . . . 1
v0.1.2
General: Restyled the index locations . 1