The tensind Package for Tensorial Indexes*

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This package provides typographically fine tensorial notation, with the following features:

- Dots filling gaps.
- Symbol subtitution to easy typing (if you are using greek letters, for example).
- Corrected position of indexes: horizontally, to compensate the small displacement in letters like f (look carefully at f^*_*) and vertically, to avoid superscripts too raised.
- Aditional minute corrections are also allowed.

1 User Interface

`\tensordelimiter{`⟨*tensor-delim*⟩`}`

Defines ⟨*tensor-delim*⟩ to be a tensor delimiter. In subsequent examples we will assume

```
\tensordelimiter{?}
```

and every instance of `?` will actually mean ⟨*tensor-delim*⟩.

`?[`⟨*format*⟩`]{`⟨*nucleous*⟩`}{`⟨*special-index*⟩`}{`⟨*special-index*⟩`}...`
⟨*super-or-sub*⟩⟨*super-or-sub*⟩`...?`

Creates a tensor. ⟨*super-or-sub*⟩ is either `_{`⟨*index*⟩`}{`⟨*index*⟩`}...` or `^{`⟨*index*⟩`}{`⟨*index*⟩`}`. ⟨*nucleous*⟩ is the symbol which indexes will be add to.

*This package is currently at version 1.1.

†For bug reports, comments and suggestions go to `http://www.tex-tipografia.com`. English is not my strong point, so contact me when you find mistakes in the manual. Other packages by the same author: accents, titlesec, dotlessi.

⟨*special-index*⟩ is a superscript which is neither covariant nor contravariant (dual, prime...). In one-letter ⟨*index*⟩, ⟨*special-index*⟩ or ⟨*nucleous*⟩, curly braces can be omitted. For example:

`?R_ij^kl_\alpha^\beta?`	$R_{ij\cdot\cdot\alpha\cdot}^{kl\ \ \beta}$
`?R^ij_kl^\alpha_\beta?`	$R^{ij\ \ \alpha}_{\cdot\cdot kl\cdot\ \beta}$
`?R**_ij^kl_\alpha^\beta?`	$R^{**kl\ \ \beta}_{ij\cdot\cdot\alpha\cdot}$
`?R**^ij_kl^\alpha_\beta?`	$R^{**ij\ \ \alpha}_{\cdot\cdot kl\cdot\ \beta}$

(*Don't forget the closing* `?`*!*) Finally, ⟨*format*⟩ changes the format in a tensor. (See `\tensorformat` below.)

`\tensorformat{`⟨*format*⟩`}`

The following letter may be used in format.

- `l` Gaps to the left of the last index are filled with dots.
- `r` Gaps to the right of the first index are filled.
- `e` If there is no index (empty), gaps are filled.
- `b` Only gaps in subscripts are filled.

Sensible settings are: none (no dots), `l` and `lrb`. Further options are:

- `c` Brings index lines closer.
- `o` Opens index lines.
- `s` Styled. `o` in display style and `c` otherwise.

These options are mutually exclusive. If none of them is used, then indexes behave in a similar way to standard ones. This document sets

```
\tensorformat{lrb}
```

`?[]f\prime_ij^kl?`	$f'^{\ kl}_{ij}$
`?[e]f^ij?`	$f^{ij}_{\cdot\cdot}$
`?[l]f*_ij^kl?`	$f^{*\cdots kl}_{\ \ ij}$
`?[c]R^ij_kl?`	$R^{ij}{}_{kl}$

`\indexdot`

This macro is the index dot. Defined to `\cdot`. You can redefine it with `\renewcommand`.

`\whenindex{`⟨*index*⟩`}{`⟨*new-index*⟩`}{`⟨*commands*⟩`}`

Automatically replaces ⟨*index*⟩ (if not enclosed in braces) by ⟨*new-index*⟩ and the additional ⟨*commands*⟩ are executed. For example, if you like to use greek indexes:

```
\whenindex{a}{\alpha}{}
\whenindex{b}{\beta}{}
\whenindex{g}{\gamma}{}
```

A `\whenindex{'}{\prime}{}` is performed by the package. For instance

`?R'_ijk^abg?` $R'_{ijk}{}^{\alpha\beta\gamma}_{\cdot\cdot\cdot}$

In ⟨*commands*⟩, two command for space fine-tuning are provided: `\sbadjust{`⟨*index*⟩`}{`⟨*comma-space*⟩`}` adds ⟨*comma-space*⟩ times `\,` before the current subscript index if the last superscript index was ⟨*index*⟩. Similarly, `\spadjust` adds the space before the current superscript index if the last subscript index was ⟨*index*⟩. For instance, the normal result of `?[]R^ik_lm?` is $R^{ij}{}_{kl}$, but with

```
\whenindex{k}{k}{\sbadjust{j}{-1}}
```

is $R^{ij}{}_{\,kl}$. These commands will be ignored if dots are used.

Two further command allowed in `\whenindex` are: `\omitdot` omits the dot for the current index, and `\finishdots` omits as well all subsequent indexes. For example

```
\whenindex{;}{\,;\,}{\finishdots}
```

`?[lr]A*_i^kl;i?` $A^{*\,;kl\,;\,i}_{\;i\cdot\cdot}$

`tensor`

The environment called by `?...?`. Useful if for some reason you don't want an equivalent defined with `\tensordelimiter` . Example:

```
\begin{tensor}[lr]A*_i^kl;i\end{tensor}
```