Documents as a source of information; Tabular packages' purposes, conflicts; Same space in matrices; Logic inferences

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1 Documents are a source of information

When one publishes a document on the Internet, e.g. using the PDF specification, it is often desirable for this file to be publicly searchable. That is, search engines should be able to parse your document content, whatever its language. They actually do pretty much the same job as what your PDF viewer does when you use the 'search' option, for e.g. some word.

It is known that for your document to be correctly interpretable by a PDF viewer, or, more generally, by a search engine, it needs to be correctly decoded. For languages without accents or special characters (which is a vague expression), you might thus refer to my fonts' encodings discussion in my preceding article: [2].

2 Tabular packages: what are their respective purposes, and which ones conflict?

When looking through different topics on StackExchange, I found an extremely interesting question: [3]. There are effectively many `tabular` environments, and it is desirable to find a quick summary on

i. the different roles and limitations of the packages,
ii. the potential conflicts between them.

Mr. Alan Munn, Stefan Kottwitz, 'lockstep' and 'Altermundus' gave a quick, yet quite comprehensive answer to these two questions.

2.1 Respective purposes

They distinguished basic packages over different categories:

- **Basic packages**
  - `array` offers more flexible column formatting, and fixes some spacing issues. This is an almost 'must-use' package,
  - `booktabs` supports professional looking tables, creates a better vertical spacing, better rules, and is specifically designed for tables without vertical lines (the norm for publication-quality tables),
  - `cellspace` ensures a minimal spacing of table cells,
  - `dcolumn` creates columns which align on a decimal marker. There are similar packages such as `numprint`, `rccol`, `warpcol` (not to forget `siunitx` whose role is to format correctly quantities depending on their unit, be it in the SI or not; it also provides the `S` column type that aligns on a decimal mark),
  - `multirow` lets tabular material span multiple rows,
  - `tabularx` provides a column type which expands to fill the specified width of the table,
  - `tabulary` provides column types which are proportional to the natural width of their contents;
- **Multi-page tables**
  - `longtable` provides tabulars that can split across pages,
  - `ltablex` also combines features of `longtable` and `tabularx`,
  - `ltxtable` combines features of `longtable` and `tabularx`,
  - `supertabular` provides tabulars that can split across multiple pages,
  - `xtab` extends `supertabular` by some features and improves page breaking;
- **Captioning and notes**
  - `floatrow` (although mainly about customizing layouts of float environments) allows for footnotes and additional explanations in tables,
  - `threeparttable` typesets tables with captions and notes matching width,
  - `threeparttablex` provides the functionality of `threeparttable` to tables created using `longtable`;
- **Color and fancy features**
  - `arydshln` prints horizontal and vertical dashed lines,
  - `bigdelim` inserts variable-sized multi-row delimiters into a table,
  - `blkarray` splits arrays into blocks and add delimiters for each block,
  - `colortab` shades and colors tables,
  - `colortbl` colors rows/columns/cells. The `xcolor` package with the `table` option provides alternating table row colors to extend it,
  - `delarray` adds delimiters (braces, parentheses, brackets) to arrays,
  - `hhline` allows better double line producing,

  - `makecell` allows multiple line cells, better headers, gape in cells, numbered rows, thick lines, diagonally divided cells, etc.,
  - `slashbox` alows diagonally divided tabular cell;
- **All-rounder**
  - `tabu` is a single package that provides much of the functionality of many of the above packages.

They also especially recommend four packages:

1. `array`, because it is a universal talent for tuning whole columns by commands,
2. `booktabs` is a 'must' for professional-looking layout,
3. `longtable` is very popular for multi-page tables,
4. `tabularx` is great for auto-sizing columns.

Other packages are then used depending on the required features.

2.2 Packages conflicts

There are some well-known conflicts between some of these packages:

- According to the manual, `arydshln` has to be loaded after `array`, `longtable`, `colortab`, and `colortbl`, respectively,
- `xtab` and `supertabular` do not work together. Loading both would cause a conflict. `xtab` should be preferred, since it is written as an extension to `supertabular`.

3 Same space between matrix elements when \boxed is used

Let us consider the following (Sudoku) matrix:

$$\begin{pmatrix} \boxed{6} & 7 & 3 & 5 & 1 & 4 & 9 & 8 & 2 \\ 9 & \boxed{2} & 1 & 3 & 6 & 8 & 7 & 5 & 4 \\ 5 & 8 & \boxed{4} & 7 & 9 & 2 & 1 & 3 & 6 \\ 8 & 9 & 6 & 2 & 3 & 7 & 4 & 1 & 5 \\ 2 & 1 & 5 & 9 & 4 & 6 & 3 & 7 & 8 \\ 3 & 4 & 7 & 1 & 8 & 5 & 2 & 6 & 9 \\ 4 & 5 & 2 & 8 & 7 & 1 & 6 & 9 & 3 \\ 1 & 6 & 9 & 4 & 5 & 3 & 8 & 2 & 7 \\ 7 & 3 & 8 & 6 & 2 & 9 & 5 & 4 & 1 \end{pmatrix}.$$

How do you manage to make the spacing the same between columns, even for columns which do not have any `\boxed` element? There are various solutions which were proposed by Mr. Voß and 'GL' at [1]:

1. You might use the `tabu` environment (with `X`-columns),
2. You might redefine a `\Boxed` command using the `mathtools` package together with

```
\def\Boxed#1{\mathclap{\fboxsep=1pt\boxed{#1}}}
```

Using the second method, one gets directly

$$\begin{pmatrix} \boxed{6} & 7 & 3 & 5 & 1 & 4 & 9 & 8 & 2 \\ 9 & \boxed{2} & 1 & 3 & 6 & 8 & 7 & 5 & 4 \\ 5 & 8 & \boxed{4} & 7 & 9 & 2 & 1 & 3 & 6 \\ 8 & 9 & 6 & 2 & 3 & 7 & 4 & 1 & 5 \\ 2 & 1 & 5 & 9 & 4 & 6 & 3 & 7 & 8 \\ 3 & 4 & 7 & 1 & 8 & 5 & 2 & 6 & 9 \\ 4 & 5 & 2 & 8 & 7 & 1 & 6 & 9 & 3 \\ 1 & 6 & 9 & 4 & 5 & 3 & 8 & 2 & 7 \\ 7 & 3 & 8 & 6 & 2 & 9 & 5 & 4 & 1 \end{pmatrix}$$

by replacing `\boxed` elements with `\Boxed` ones. If you decide to put e.g. bigger numbers (such as 60 or 200), you might think about increasing `\arraycolsep` (e.g. to `15pt`).

4 Logic inferences

To typeset

$$\dfrac{\dfrac{[(p\rightarrow\perp)\rightarrow\perp] \quad [p\rightarrow\perp]}{\perp}\,(\rightarrow E)}{p}\,(RAA)$$
$$\dfrac{}{((p\rightarrow\perp)\rightarrow\perp)\rightarrow p}\,(\rightarrow I)$$

you might consider using the `proof` package using e.g.

```
\infer[(\rightarrow I)]
 {((p\rightarrow \perp) \rightarrow \perp) \rightarrow p}
 {\infer[(RAA)]
  {p}
  {\infer[(\rightarrow E)]
    {\perp}
    {[(p\rightarrow \perp) \rightarrow \perp]  %
    &  [p\rightarrow \perp] }
  }
}
```

Thanks to Mr. Tennent for this idea [4]. There are obviously other packages to typeset inferences.

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References

[1] GL, Herbert Voß, and Luca Merciadri. Spacing in matrix with \boxed elements (comp.text.tex discussion), 2011.

[2] Luca Merciadri. Some misunderstood or unknown tricks (XI) and encoding issues (II). *TUGboat*, pages ?–?

[3] StackExchange. Which tabular packages do which tasks and which packages conflict?, 2011. `http://tex.stackexchange.com/questions/12672/which-tabular-packages-do-which-tasks-and-which-packages-conflict`.

[4] Bob Tennent and Luca Merciadri. Logic inferences in LaTeX (comp.text.tex discussion), 2011.