An output routine for an illustrated book

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TUG2014

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1. Introduction

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ConTEXt: an exquisite mechanism with floats spanning *n* of *m* columns [Hagen, 2003][3]

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[3] H. Hagen. *Columns*, 2003. http://www.pragma-ade.nl/general/manuals/columns.pdf

1.2. Common assumptions

1. The most important part is the *text.*
2. Illustrations are put afterwards:
   (a) Not too far from the point they are mentioned
   (b) Form not too ugly pages

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What if the assumptions are wrong?

2. Illustrated books

Definition: a book where the illustrations tell the story.

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Example: art albums

Rick Cusick, What Our Lettering Needs: The Contribution of Hermann Zapf to Calligraphy & Type Design at Hallmark Cards. RIT Cary Graphics Art Press, 2011.

Example: FAO Statistical Yearbook

Environment 1D

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

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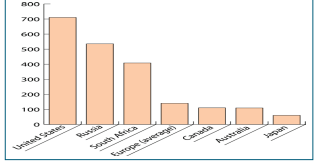
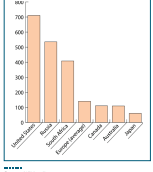
CHART 17: Incarceration ratest across countries



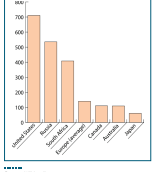
Source: Wikipedia

CHART 15: Incarceration ratest across countries



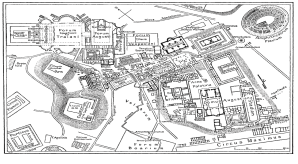
Source: Wikipedia

CHART 16: Incarceration ratest across countries



Source: Wikipedia

MAP 3: Incarceration ratest across countries



Source: Wikipedia

Layout principles:

1. Illustrations are put on predefined places *(often on a coarse grid)*.
2. Text follows the illustrations, not the other way round.

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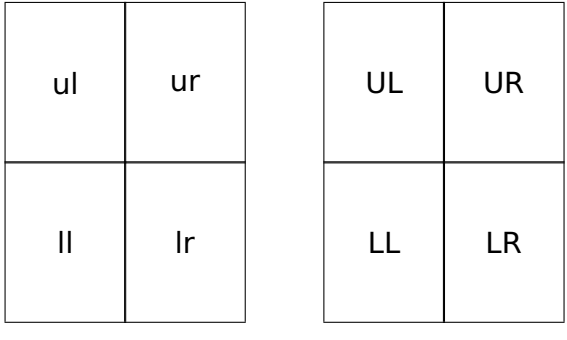
Problem: TEX page builder has a different paradigm!

3. Making FAO Yearbook

3.1. A spread

Eight quadrants:



`\clearspread` command.

Illustrations:

Single: one quadrant

Tall: two quadrants

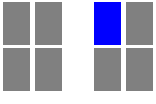
Wide: two quadrants

Big: four quadrants

3.2. Interface

We *explicitly* set the size and the position of illustrations; text follows the gaps:

```
\begin{chart}{S}{UL}
  ...
\end{chart}
```



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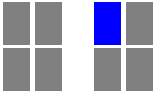
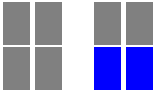
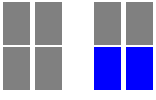


```
\begin{map}{T}{ur}
  ...
\end{map}
```

```
\begin{chart}{W}{LL}
  ...
\end{chart}
```

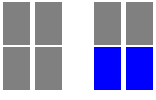


```
\begin{chart}{W}{LL}
  ...
\end{chart}
```



```
\begin{map}{B}{ul}
  ...
\end{map}
```

```
\begin{chart}{W}{LL}
  ...
\end{chart}
```



```
\begin{map}{B}{ul}
  ...
\end{map}
```

Each command adds the illustration to the corresponding box (to be `\vsplit` later).

3.3. Page Builder and OTR

Page builder: create a column of text. When the column is done, call OTR.

OTR has two stages: output a column, *and* output a page.

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OTR has two stages: output a column, *and* output a page.

First stage inputs:

1. Column of text
2. Whether this is the first or the second column, whether this is a recto or verso page.
3. Boxes with illustrations.

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OTR has two stages: output a column, *and* output a page.

First stage inputs:

1. Column of text
2. Whether this is the first or the second column, whether this is a recto or verso page.
3. Boxes with illustrations.

Second stage inputs: two columns of text *and/or* page-wide illustrations.

3.4. OTR algorithm: First Stage

Start: have a column of text from page builder and boxes.

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Start: have a column of text from page builder and boxes.

First, do we have a page completely covered by illustrations?

---

if *got Big or both top & bottom Wide illustrations* **then**
    if *second column* **then**
        Error
    Send the illustrations to the special OTR;
    Send text back to page builder

Maybe the column is completely taken by illustrations?

---

if *got Tall or both top & bottom Single illustrations* **then**

    Form a column from the illustrations;
    Send the column to the second stage;
    Send the text back to page builder

Did the page builder know the right height?

Calculate column height;
if *column height equals* `\vsize` **then**
    Add illustrations to the column;
    Send the column to the second stage
else
    Change `\vsize`;
    Send text back to page builder;
    Leave OTR

This makes at most 2 passes.

3.5. OTR Algorithm: second stage

This is easy:

---

if *first column* **then**
  Save column
else
  Add first column and wide illustrations, add decorations and the send page out
Reset `\vsize`;
Leave OTR

3.5. OTR Algorithm: second stage

This is easy:

---

if *first column* **then**
  Save column
else
  Add first column and wide illustrations, add decorations and the send page out
Reset `\vsize`;
Leave OTR

Special case: only wide or big illustrations. Just add decorations and send the page out

3.6. What works?

1. Text flows, illustrations flow.
2. Pages with the same pattern flow.

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2. Pages with the same pattern flow.

3.7. What does not work?

1. “Wrong” requests (Wide and Tall illustrations on the same page).
2. Pattern change without `\clearspread`

The first 90 percent of the code accounts for the first 90 percent of the development time. The remaining 10 percent of the code accounts for the other 90 percent of the development time.

Tom Cargill, http://en.wikipedia.org/wiki/Ninety-ninety_rule

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>
> *Tom Cargill*, http://en.wikipedia.org/wiki/Ninety-ninety_rule

I decided not to spend “the other 90%”.

4. Conclusions

TEX can be coaxed to produce an illustrated book!

Code: https://github.com/filippogheri/FAOSYBLaTeXpackage

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Acknowledgements

Filippo Gheri, Amy Heyman, Shira Fano and other great people at FAO UN

Hans Hagen and Frank Mittelbach for discussion of ConTEXt and LATEX float routines.

References

J. Braams, D. Carlisle, A. Jeffrey, L. Lamport, F. Mittelbach, C. Rowley, and R. Schöpf. *ltfloat.dtx*, 2002.

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