Instructions for scribing notes

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January 1st, 2017 – December 31st, 2017

Contents

1 Style for taking course notes

Lecture 10: January 1st, 2017

The course notes are supposed to be in the form of a single document. The idea is to make this a single consistent document for the course and not individual lectures, and just have margin marks to demarcate each lecture such as the one on the right which was obtained via:

```
\lecture{10}{1}{1}{2017}
```

This will be the template of the course. This document should compile without any difficulty as long as all the standard packages have been installed on your system.

1.1 *Macros provided*

Take a look at the file `commons.sty` which has a lot of LaTeX macros that you would commonly need.

Whenever possible, use the *delimiter pairs* defined in `commons.sty` instead of `\left` and `\right`. For example, a paranthesized expression such as

$$\left(\frac{x}{y} + \frac{y}{x}\right)$$

is obtained via `\inparen{\frac{x}{y} + \frac{y}{x}}`.

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If there are other macros that you would like to add, feel free to add them to the file `macros.tex` (which currently just has some basic course-specific macros).

1.2 *Theorem environments etc.*

The template also provides the following theorem-related environments: theorem, lemma, corollary, proposition, example, remark, claim, subclaim, observation, fact, axiom, definition, construction, exercise, question, openproblem.

The definitions also enable the use of `\autoref{..}` so you may make use of that (and the use of `\autoref{..}` is preferred over `Lemma~\ref{..}` as it looks nicer).

1.3 *Other good LaTeX practices*

align vs eqnarray

It is recommended that you *avoid* using the `eqnarray` environment but instead use `align` environment[1]. A simple google search should tell you why the `align` environment is *so much better* than the `eqnarray` environment.

Spacing for math macros

This is one of the most overlooked mistakes made by people. Often, you might want to include some text as a part of an math equation. The ugliest mistake that people make is just include it as is: `$x = sin y$` which displays as $x = siny$ which is clearly not what was intended. It is important to know the following three different ways of including text inside math environments.

- `\text{blah}`: This should be used only when you truly want the text to be text. A correct use of this is:

  `$P_n = \{\text{primes that are less than $n$}\}$`

  $P_n = \{\text{primes that are less than } n\}$

- `\operatorname{blah}`: More often than not, this is the way you want to include text in a math environment but is probably the least known macro. This is specifically meant to be defined when 'blah' is an *operator* that would often take an argument. So when you want a macro for rank, or dimension, or span etc., this is what you are looking for. Look at difference between

  `$2 \mathrm{sin} \theta$`: $2\mathrm{sin}\theta$

  and

  `$2 \operatorname{sin} \theta$`: $2\sin\theta$.

[1] I confess that even I often end up using `eqnarray` but this is a habit I want to change.

- `\mathrm{blah}`:What this essentially does is use the font for the usual text inside a math environment with the only distinction being that it remains upright even in an italicised or emphasized environment (such as a theorem environment). For example, look at

  ```
  x:$x$:$\mathrm{x}$ \quad\quad \emph{x:$x$:$\mathrm{x}$}
  ```

  which is typeset as

  x:x:x x:x:x.

  But remember, this does not add any spaces around the argument and so is unsuitable when you want to use as a macro on function names.

  I don't know too many examples where the correct macro is using `\mathrm{..}`.

Dots

Latex provides many ways of defining ellipsis or dots. `\cdots`, `\ldots`, `\ddots`, `\ddots`. A common mistake made is using
`$x_1 + \ldots + x_n$` instead of `$x_1 + \cdots + x_n$`
(resulting in $x_1 + \ldots + x_n$ instead of $x_1 + \cdots + x_n$),
or using `$S = \{x_1,\cdots,x_n\}$` instead of `S = \{x_1,\ldots, x_n\}$`
(resulting in $S = \{x_1, \cdots, x_n\}$ instead of $S = \{x_1, \ldots, x_n\}$).
Pay attention to whether you want the ellipses to be at the baseline, or if you want them to be centered vertically.

LaTeXdoes have a macro called `\dots` which tries to determine the correct form of dots that should be added, but this sometimes does not work as intended. But it is of course better for you to specifically use the right version of dots.

2 Uploading your notes

If you know how to use `git`, you may do so on megh. But if you don't, you can just download the source files from there, make your changes and email the edited files to me.

Each student is required to scribe at least one lecture. Besides this, every single typo/correction made by a student would earn additional credit (the exact amount would be decided by the instructor depending on the extent of the correction).