LyX Notes

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- \rule: useful for creating forms. For instance, `\rule[-1ex]{3in}{1pt}` typesets

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- \hfill: automatically fills a horizontal space. Doing `\hspace{\stretch{1}}` achieves the same effect.
  For instance, `$A=A \hfill B=B$` typesets $A = A \hfill B = B$
  `A=A \hfill B=B` typesets A=A B=B
  You can put it at the start of a separate line, to get:
  $A = A \hfill B = B$

- \dotfill: $A = A \dotfill B = B$

- \hrulefill: $A = A \hrulefill B = B$
  Example application:

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- \middle: draws a verticle line with automatic height adjustment. See, for instance,

$$\left\langle \phi \middle| J = \frac{3}{2}, M_J \right\rangle$$

  and

$$\left[B_W^T \middle| A\right]$$

- \xleftarrow and \xrightarrow: achieves

$$A \xleftarrow[C]{B} D \xrightarrow[F]{E} G$$

- \underset and \overset: gives $\underset{x}{E}[\quad]$ and $\overset{\infty}{\underset{-\infty}{\sum}}[\quad]$ *inline* or anywhere you desire.

- spaces: in a math environment, use the shortcut Ctrl+Shift+Space to create a thin space, and press Space to get different sizes. Can also do \quad and then press Space.

- \hspace: can do this directly in a math environment; e.g. $A = B \quad A = C$

- \boxed: puts a box around a formula

$$\boxed{A = B}$$

$$\boxed{\int x \mathrm{d}x}$$

- \fbox: a bit more flexible than boxed; users can change the frame thickness and separation with text: put **\fboxrule 1mm \fboxsep 3mm** before the boxed item and **\fboxrule 0.4pt \fboxsep 3pt** after (for recovering to original box sizing). Example:

$$\int x\mathrm{d}x$$

- \colorbox: create colored boxes. For instance, `\colorbox{red}{\ensuremath{A=B}}` typesets

$A = B$

- colored equation: `\textcolor{red}{\[A=B\]}` typesets

$$A = B$$

- self-defined operators: in the LyX preamble, you can define, for instance,
  \DeclareMathOperator*{\E}{E}
  \DeclareMathOperator*{\minimize}{minimize}
  and then in the body use `\E\left[A\right]` and `\minimize_{a}f\left(x\right)`
  to get

$$\mathrm{E}\left[A\right]$$

$$\underset{a}{\mathrm{minimize}}\, f\left(x\right)$$

- the shortcut **Alt+C S** (**Control+C S** on a Mac) changes the text font to \textsf: ABC
- special symbols and characters: \bigstar—★; \o (only in TEX mode)—ø; \O (only in TEX mode)—Ø
- flalign format: can put multiple columns and align make the equation aligh to the left. See the effects below

$$A = B \tag{1}$$

- \ensuremath: ensures the math environment
- \intertext{}: a tool in deriving equations in math align environments. For instance,
  `\begin{align}`
  `A&=B\\\intertext{but\ \ensuremath{B=C},\ \text{therefore}}&=C`
  `\end{align}`
  typesets

$$A = B \tag{2}$$

but $B = C$, therefore

$$= C \tag{3}$$

- math macros: can directly transform existing macros to LyX macros. For instance, by selecting
  `\newcommand{\arr}[0]{\ar[r]}`
  and pressing Ctrl+M (or Command+M on a Mac), you define the LyX macro \arr that functions as \ar[r]. You can then use, for instance, `\xymatrix{A\arr & B}` to get $A \longrightarrow B$.

- cancel formulas: use \cancel, \xcancel, \cancelto to achieve, for instance,

$\cancel{A = B}$

$\xcancel{A = B}$

$\cancelto{1}{A = B}$

- equations with descriptions of variables: in an align environment, you create several columns and put the variable descriptions in an sub matrix in one of the columns. For instance, you can do
  \begin{align}
  F&=bA+B &&
  \footnotesize\begin{array}{ll}b & \text{density}\\A & \text{area}\\B & \text{phase}\end{array}
  \end{align}
  to get

$$F = bA + B \qquad \begin{array}{ll} b & \text{density} \\ A & \text{area} \\ B & \text{phase} \end{array} \tag{4}$$

- \displaystyle: display style for inline formulas. See the difference between $\frac{A}{B}$ and $\frac{A}{B}$
- \dfrac: generates a fraction that always has the size of a displayed style. e.g., $\dfrac{A}{B+C}$ (compare to $\frac{A}{B+C}$) and $\dfrac{A+\frac{A}{B}}{A+B}$
- \tfrac: generates a fraction that always has the size of a text style. See the difference between

$$\tfrac{A}{A+B}$$

  and

$$\dfrac{A}{A+B}$$

- \cfrac: \dfrac for nested fractionsp