

1 Issue 2557

When typing display math LaTeX in a markdown note, the written LaTeX is parsed correctly but displayed incorrectly, with certain constructs having line breaks between tokens.

1.1 Steps

1. Launch Boostnote
2. Open a new Markdown Note. Press *Ctrl N* or click on the icon next to the search bar; then select Markdown Note.
3. Toggle mode to two panels in the top right corner (should be the default). Now you should have two panels open, the edit and view panels.
4. Reproduce the error. Type the following in the edit panel:

```


$$\begin{aligned}
&P(X=x) = \binom{n}{k} P^x (1-p)^{(n-x)} \\
&Var(X) = np(1-p)
\end{aligned}$$


```

1.2 Requirements

As of release v0.11.9 of Sep 9, and upstream master branch as of Nov 14, we get this result:

$$P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$$

$$Var(X) = np(1 - p)$$

However, the expected result is naturally:

$$P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$$

$$Var(X) = np(1 - p)$$

The problem is that there is a line break where there should not be one: line breaks in display math mode are not allowed outside environments, and inside environment aligned line breaks are inserted with '\', enumerating equations.

1.3 Source Code Files

The bug is the file:

- browser/components/markdown.styl

```
body
  font-size 16px
  padding 15px
  font-family helvetica, arial, sans-serif
  line-height 1.6
  overflow-x hidden
  background-color $ui-noteDetail-backgroundColor
  .flowchart-error, .sequence-error .chart-error
    background-color errorBackgroundColor
    color errorTextColor
    padding 5px
    border-radius 5px
    justify-content left
  .katex
    font 400 1.2em 'KaTeX_Main'
    line-height 1.2em
    white-space initial
    text-indent 0
  .katex .mfrac>.vlist>span:nth-child(2)
    top 0 !important
  .katex-error
    background-color errorBackgroundColor
    color errorTextColor
    padding 5px
    margin -5px
    border-radius 5px
li
  label.taskListItem
    margin-left -1.8em
    &.checked
      text-decoration line-through
      opacity 0.5
    &.taskListItem.checked
      text-decoration line-through
      opacity 0.5
div.math-rendered
  text-align center
.math-failed
  background-color alpha(red, 0.1)
  color darken(red, 15%)
  padding 5px
  margin 5px 0
  border-radius 5px
```

1.4 Source of the problem

The problem is not in the dependency (**KaTeX**). The **KaTeX** dependency includes its own major stylesheet, which should enforce this restriction on its own display math elements. So the problem should be in some of Boostnote's own style sheets, conflicting somehow with those of **KaTeX**.

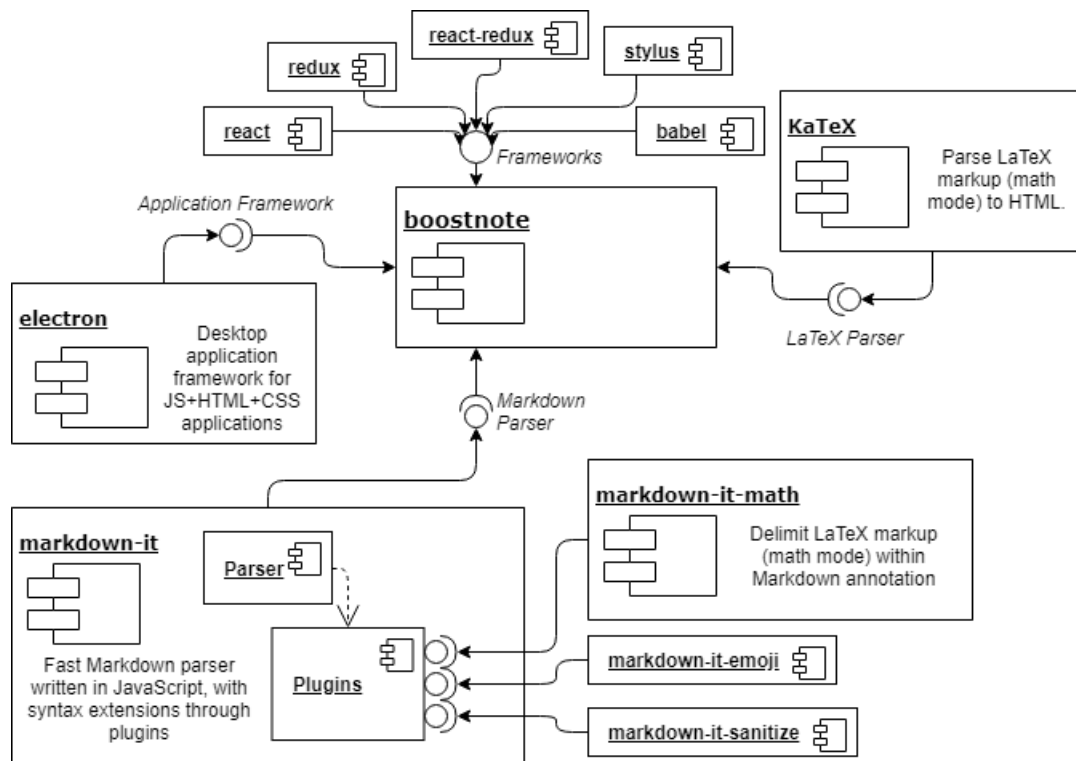
Inspecting the elements inside Boostnote (*Ctrl Shift I*) suggests looking at class names *.katex* and *.katex-display*, as the rendered LaTeX parent element has these class names. A quick

```
grep -rnE "\\..katex" browser/
```

immediately pinpoints file markdown.styl.

1.5 System Architecture

A simple rundown of Boostnote's main dependencies, with emphasis on markdown-it and katex:



1.6 Design of the fix

Discussion

KaTeX, being a LaTeX formatting engine for the web, would certainly not have made it this far while allowing line breaks inside display math environments generally. We verified this earlier. So Boostnote's own stylesheets must be messing around where they shouldn't, and overwriting KaTeX's imported stylesheets.

There are a few ways to fix this issue, but a proper fix will ultimately be a **breaking change** as it will disallow line wrapping in display math environments — much to the dislike of some users, probably.

Changing this attribute to nowrap will have unintended side effects (no wrapping in inline math mode), so the problem, albeit simple, will require further testing. The most likely solution will involve demoting selector body `.katex` to `.katex-inline` or removing the attribute, or even removing the `.katex` rules altogether.

Source of the problem

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```
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```

on the repository's main directory immediately pinpoints file **browser/components/markdown.styl**.

At katex.org we compare the computed styles of the LaTeX shown on the front page to those of Boostnote applied to the same LaTeX elements. In particular we looked at attributes like `display`, `text-align`, and `overflow-wrap`. We concluded quickly that the problem was in the attribute *white-space*, whose value was reset to **initial** in Boostnote (in this case normal) for everything math element, instead of *nowrap* which is KaTeX's own style.

1.7 Fix source code

The fix is essentially removing style `*whitespace nowrap` from *markdown.styl* while causing the smallest possible breaking change. After due analysis and experimentation on a variety of LaTeX constructs we decided to remove the entire rule *.katex* and replace it with a simple switch: *whitespace nowrap* for KaTeX display elements and *whitespace initial* otherwise.

1.8 Validate the fix

Solution Images

Consider the following content of a Markdown Note, containing mostly LaTeX and little Markdown:

```
1 ##### Display environment, good LaTeX:
2
3 $$\begin{aligned}
4 &P(X=x)=\binom{n}{k}P^x(1-p)^{(n-x)}\\
5 &\text{\&Var}(X)=np(1-p)
6 \end{aligned}$$
7
8 ▾ ##### Inline, good LaTeX:
9
10 $\{a,b\}$, lorem ipsum dolor sit amet, $\{a,b,c,d\}$, $\{a,b,c\}$,\{x,y,z,w\},\{x,y,z,w,a,b,c,d\},\{
11 x,y,w,z,1,2,3,4,a,b,c,d\}$ lorem ipsum.
12
13 $\{a,b,c\}$,\{x,y,z,w\},\{x,y,z,w,a,b,c,d\},\{x,y,w,z,1,2,3,4,a,b,c,d\}$
14
15 Lorem ipsum dolor sit amet, $P(X=x)=\binom{n}{k}P^x(1-p)^{(n-x)}$
16 ▾ ##### Inline environment, bad LaTeX:
17
18 $\begin{aligned}
19 &\{a,b,c\},\{x,y,z,w\},\{x,y,z,w,a,b,c,d\},\{x,y,w,z,1,2,3,4,a,b,c,d\}\%&
20 \end{aligned}$
21
22 $\begin{aligned}
23 &\&\{a,b,c\},\{x,y,z,w\},\{x,y,z,w,a,b,c,d\},\{x,y,w,z,1,2,3,4,a,b,c,d\}
24 \end{aligned}$
25
26 ▾ ##### Inline environment, bad LaTeX:
27
28 $\begin{aligned}
29 &P(X=x)=\binom{n}{k}P^x(1-p)^{(n-x)}\\
30 &\text{\&Var}(X)=np(1-p)
31 \end{aligned}$
```

Now, below on the left is Boostnote's representation of the above LaTeX, and on the right that same LaTeX after the fix.

Display environment, good LaTeX:

$$P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$$

$$Var(X) = np(1 - p)$$

Inline, good LaTeX:

{a, b}, lorem ipsum dolor sit amet, {a, b, c, d},
 {a, b, c}, {x, y, z, w}, {x, y, z, w, a, b, c, d}, {x, y, w, z, 1, 2, 3, 4,
 a, b, c, d}
 lorem ipsum.

{a, b, c}, {x, y, z, w}, {x, y, z, w, a, b, c, d}, {x, y, w, z, 1, 2, 3, 4,
 a, b, c, d}

Lorem ipsum dolor sit amet, $P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$

Inline environment, bad LaTeX:

{a, b, c}, {x, y, z, w}, {x, y, z, w, a, b, c, d}, {x, y, w, z, 1, 2, 3, 4,
 a, b, c, d}
 {a, b, c}, {x, y, z, w}, {x, y, z, w, a, b, c, d}, {x, y, w, z, 1, 2, 3, 4,
 a, b, c, d}

Inline environment, bad LaTeX:

$$P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$$

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Display environment, good LaTeX:

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Inline, good LaTeX:

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 {a, b, c}, {x, y, z, w}, {x, y, z, w, a, b, c, d}, {x, y, w, z, 1, 2, 3, 4,
 a, b, c, d}
 lorem ipsum.

{a, b, c}, {x, y, z, w}, {x, y, z, w, a, b, c, d}, {x, y, w, z, 1, 2, 3, 4,
 a, b, c, d}

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 a, b, c, d}
 {a, b, c}, {x, y, z, w}, {x, y, z, w, a, b, c, d}, {x, y, w, z, 1, 2, 3, 4,
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Inline, good LaTeX:

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 {a, b, c}, {x, y, z, w}, {x, y, z, w, a, b, c, d}, {x, y, w, z, 1, 2, 3, 4, a, b, c, d}
 lorem ipsum.

{a, b, c}, {x, y, z, w}, {x, y, z, w, a, b, c, d}, {x, y, w, z, 1, 2, 3, 4, a, b, c, d}

Lorem ipsum dolor sit amet, $P(X = x) = \binom{n}{k} P^x (1 - p)^{(n-x)}$

Inline environment, bad LaTeX:

{a, b, c}, {x, y, z, w}, {x, y, z, w, a, b, c, d}, {x, y, w, z, 1, 2, 3, 4, a, b, c, d}
 {a, b, c}, {x, y, z, w}, {x, y, z, w, a, b, c, d}, {x, y, w, z, 1, 2, 3, 4, a, b, c, d}

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 lorem ipsum.

{a, b, c}, {x, y, z, w}, {x, y, z, w, a, b, c, d}, {x, y, w, z, 1, 2, 3, 4, a, b, c, d}

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Inline environment, bad LaTeX:

{a, b, c}, {x, y, z, w}, {x, y, z, w, a, b, c, d}, {x, y, w, z, 1, 2, 3, 4, a, b, c, d}
 {a, b, c}, {x, y, z, w}, {x, y, z, w, a, b, c, d}, {x, y, w, z, 1, 2, 3, 4, a, b, c, d}

Inline environment, bad LaTeX:

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Notice how, on the narrow display panel, the display math overflows the x-axis and is hidden. This is the expected behaviour in any LaTeX document.

1.9 Submission of the fix

The pull request was accepted on 16 December.

The issue was not changed from Delivery 1, nor any extra/adjacent issues were created or fixed along with this one.

2 Wrap Up

Diogo Yaguas - Searching issues and report

Bruno Carvalho - Issue #2557

Tiago Castro - Issue #2554

The work distribution was equally distributed.