Scripted PDF

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The point of this exercise is to demonstrate flexible rendering of subscripts and superscripts. We want to write expressions for column labels and units that are fairly readable as they are, and yet can be easily rendered with equivalent results in plotmath, html, or pdf.

First we load some packages.

```
library(magrittr)
library(ggplot2)
library(tablet)
library(yamlet)
library(dplyr)
library(kableExtra)
```

We create some example data.

```
x <- data.frame(
  time = 1:10,
  work = (1:10)^1.5,
  group = 1:2,
  set = c(rep('delta',5), rep('gamma', 5))
)
x %<>% decorate('
 time: [ Time_cum.^alpha, h ]
 work: [ Work_total_obs\\n, kg*m^2/s^2 ]
 group: [ Group, [ Second\\nGroup^\\*: 2, First\\nGroup^#: 1 ]]
 set: [ Set, [ gamma, delta ]]
')
x %>% decorations
```

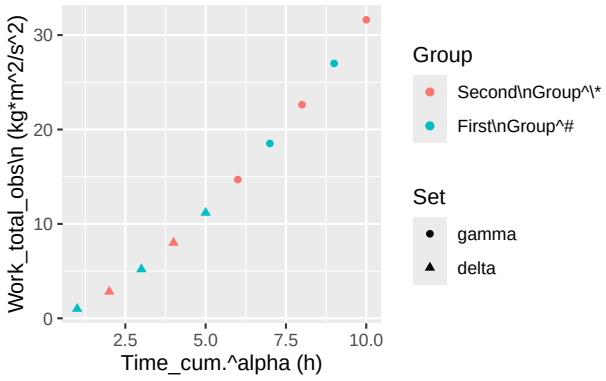
```
## - time
##  - label: Time_cum.^alpha
##  - guide: h
## - work
##  - label: Work_total_obs\n
##  - guide: kg*m^2/s^2
## - group
##  - label: Group
##  - guide
##   - Second\nGroup^\*: 2
##   - First\nGroup^#: 1
## - set
##  - label: Set
##  - guide: gamma, delta
```

The label for column `work` has nested subscripts suggesting $\mathsf{Work}_{\mathsf{total}_{\mathsf{obs}}}$. The label for column `time` suggests

$\text{Time}_{\text{cum}}{}^{\alpha}$. The dot closes the subscript to distinguish this from $\text{Time}_{\text{cum}^{\alpha}}$. Backslash-n requests a line break.

How does this look when we plot it?

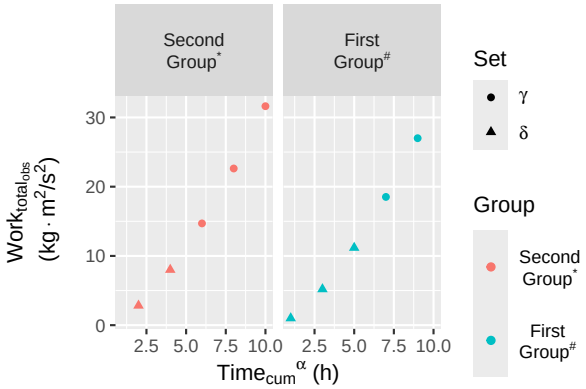
```
x %>%
  resolve %>%
  ggplot(aes(time, work, color = group, shape = set)) +
  geom_point()
```



By default, we get verbatim labels and units as substitutes for column names.

Next, we use `enscript()` instead of `resolve()` to indicate that the labels should be understood as potentially having subscripts and superscripts. For this to work well, units should be constructed using *, /, and ^ (even though the "units" package supports other encodings).

```
x %>%
  enscript %>%
  ggplot(aes(time, work, color = group, shape = set)) +
  facet_grid(~ group) +
  geom_point()
```



In the background, `enscript()` is writing **expression** and **plotmath** attributes (consumed by `ggplot()`) and **title** attributes (consumed by `tablet()`). We illustrate the latter.

```
x %>%
  enscript %>%
  group_by(group, set) %>%
  tablet %>%
  as_kable
```

	Second Group*		First Group#		
	γ (N = 3)	δ (N = 2)	γ (N = 2)	δ (N = 3)	All (N = 10)
$\mathbf{Time_{cum}}^{\alpha}$ (h)					
Mean (SD)	8 (2)	3 (1.41)	8 (1.41)	3 (2)	5.5 (3.03)
Median (range)	8 (6, 10)	3 (2, 4)	8 (7, 9)	3 (1, 5)	5.5 (1, 10)
Missing	0	0	0	0	0
$\mathbf{Work_{total_{obs}}}$ ($\mathbf{kg \cdot m^2/s^2}$)					
Mean (SD)	23 (8.47)	5.41 (3.66)	22.8 (6)	5.79 (5.12)	14.3 (10.5)
Median (range)	22.6 (14.7, 31.6)	5.41 (2.83, 8)	22.8 (18.5, 27)	5.2 (1, 11.2)	12.9 (1, 31.6)
Missing	0	0	0	0	0

In summary, we have decorated our data with labels and units containing markup for subscripts and superscripts. If everything goes well, these render similarly in figures and tables. They also render similarly in html and pdf. Please see the html version of this document.