PMO Brief - Mike

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Introduction

This PDF is a form of publication based on Edward Tufte's LaTeX [1] document classes. Tufte's style is known for its extensive use of sidenotes, tight integration of graphics with text, and well-set typography.

[1] https://code.google.com/p/tufte-latex/

As CDOT begins to explore its large (and growing) volume of data, it will become increasingly important to have portable, reproducible research in the form of these interactive notebooks.

Key Findings

Images and graphics play an integral role in our analysis, and will be used as the primary means of displaying results.

Here, we can see 14,462 payments made between 2000 and 2014.

```
glimpse(raw)
```

```
## Observations: 14462
## Variables:
## $ ID         (fctr) C12718, C11581, C130...
## $ Region     (int) 2, 2, 1, 1, 2, 2, 3, ...
## $ District   (int) 1, 1, 1, 1, 1, 2, 1, ...
## $ Amount     (dbl) 269909.4, 130021.9, 1...
## $ Date       (date) 2000-07-05, 2000-07-...
## $ Contractor (fctr) 169A, 169A, 505A, 76...
```

```
ggplot(raw, aes(x = Date, y = Amount)) +
  geom_line(color = year(raw$Date))
```

Note the use of the `aes(x,y)` option to map the graph's aesthetics to the features in our data. For example, **$ Date** is mapped to the **x-axis** and **$ Amount** is mapped to the **y-axis**.

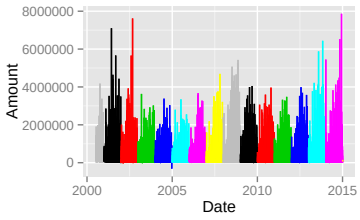

Figure 1: All Construction Payments on Contracts, July 2000 - December 2014

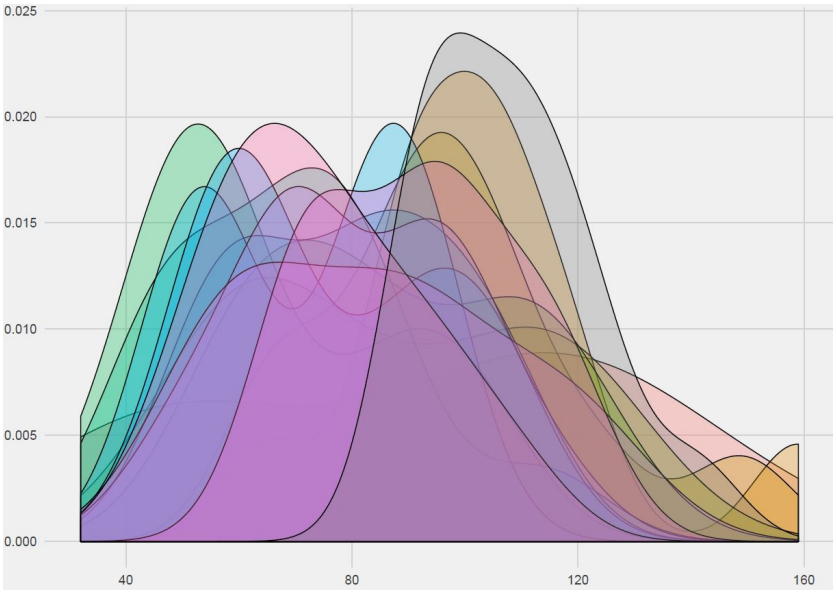

Figure 2: This illustration shows how the count of monthly payments is distributed, by the uniquely colored years' density distributions. For example, 2011's grey distribution shows the highest number of monthly payments was around 105. Note that no two years are the same.

Full Width Figures

You can arrange for figures to span across the entire page by using the `fig.fullwidth` chunk option.

```
qplot(wt, mpg, data = mtcars, colour = factor(cyl))
```

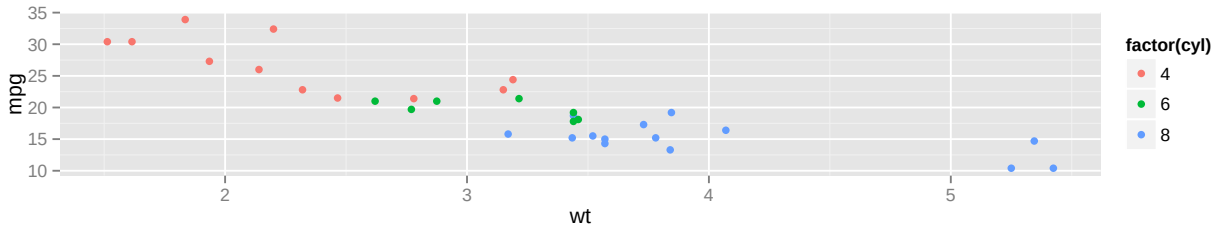

Figure 3: Full width figure

Note the use of the `fig.width` and `fig.height` chunk options to establish the proportions of the figure. Full width figures look much better if their height is minimized.

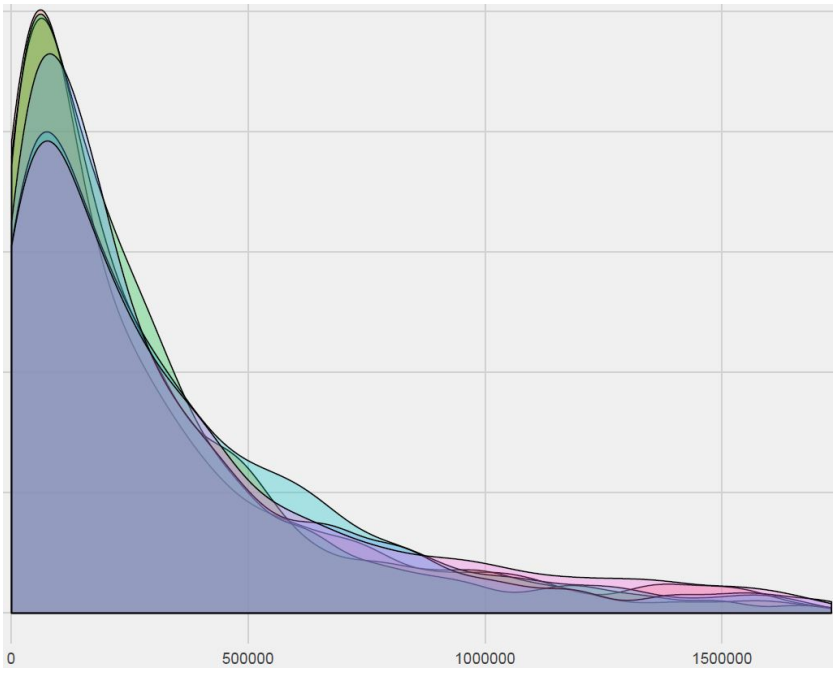

Figure 4: BLAH BLAH BLAH.

Main Column Figures

Besides margin and full width figures, you can of course also include figures constrained to the main column.

```
qplot(factor(cyl), mpg, data = mtcars, geom = "boxplot")
```

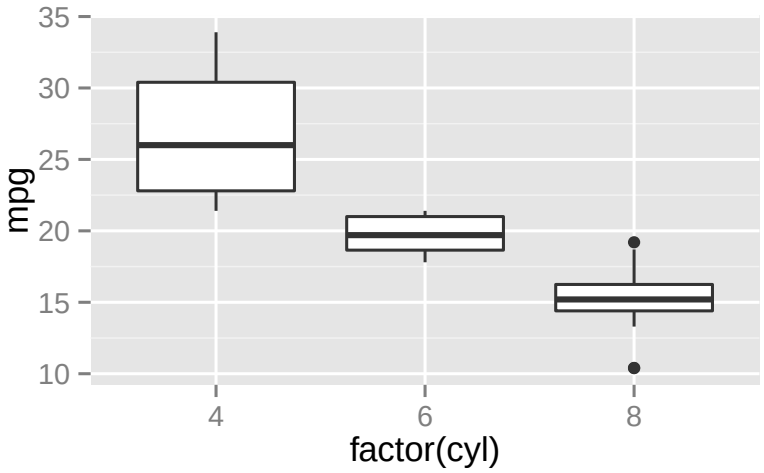

Figure 5: Another figure

Sidenotes

One of the most prominent and distinctive features of this style is the extensive use of sidenotes. There is a wide margin to provide ample room for sidenotes and small figures. Any use of a footnote will automatically be converted to a sidenote. [2]

If you'd like to place ancillary information in the margin without the sidenote mark (the superscript number), you can use the `\marginnote` command.

Note also that the two footnote references (`tufte_latex` and `books_be`, both defined below) were also included in the margin on the first page of this document.

[2] This is a sidenote that was entered using a footnote.

This is a margin note. Notice that there isn't a number preceding the note.

Tables

You can use the **xtable** package to format LaTeX tables that integrate well with the rest of the Tufte handout style. Note that it's important to set the `xtable.comment` and `xtable.booktabs` options as shown below to ensure the table is formatted correctly for inclusion in the document.

```
library(xtable)
```

```
##
## Attaching package: 'xtable'
##
## The following object is masked from 'package:timeDate':
##
##     align
```

```
options(xtable.comment = FALSE)
options(xtable.booktabs = TRUE)
xtable(head(mtcars[, 1:6]), caption = "First rows of mtcars")
```

	mpg	cyl	disp	hp	drat	wt
Mazda RX4	21.00	6.00	160.00	110.00	3.90	2.62
Mazda RX4 Wag	21.00	6.00	160.00	110.00	3.90	2.88
Datsun 710	22.80	4.00	108.00	93.00	3.85	2.32
Hornet 4 Drive	21.40	6.00	258.00	110.00	3.08	3.21
Hornet Sportabout	18.70	8.00	360.00	175.00	3.15	3.44
Valiant	18.10	6.00	225.00	105.00	2.76	3.46

Table 1: First rows of mtcars

```
var s = "JavaScript syntax highlighting";
alert(s);
```