Using LaTeX in reports at Grattan

Manual for `grattex` v1.3.3 and `grattanReporter` v0.27.0

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Contents

Quick-reference

Releasing a report

1. Push any outstanding changes to GitHub.

2. Verify the build is passing on Travis.

3. Go to your GitHub repository.

4. Click the `.travis.yml` file and edit it as follows

```
 2  ■■■■■  .travis.yml                                                                    View  🖥  ✎

           @@ -85,7 +85,7 @@ before_script:
 85   85    script:
 86   86      - set -e
 87   87      - for i in *.tex; do pdflatex -interaction=nonstopmode $i; done
 88   -      - Rscript -e 'library(grattanReporter);checkGrattanReport(compile = TRUE, pre_release = FALSE, .proceed_after_rerun = 3)'
      88   +      - Rscript -e 'library(grattanReporter);checkGrattanReport(compile = TRUE, pre_release = TRUE, release = TRUE, embed = FALSE)'
 89   89
 90   90    notifications:
 91   91      slack: grattex:7yiVyM6NvMmCE49ccxaUX2QG#transport
```

5. Commit it to the master branch

6. Push any fixes from ShareLaTeX to GitHub until the build passes on Travis.

7. If your report was started before February 2017—run `library(grattanReporter); checkGrattanReport('<path/to/your/project>', compile = TRUE, pre_release = TRUE, release = TRUE, embed = <TRUE|FALSE>)` and then deploy the file written in the `RELEASE` subdirectory.

8. If your report was started after February 2017—click download in ShareLaTeX.

Expected LaTeX competencies

Table 0.1: List of competencies

Competency	Page ref.	PD / Fellow / Editor	Associate	LaTeXnician
Initial report stage/conversion/general				
Draft so that conversion is efficient		✔	✔	✔
Create new ShareLaTeX doc, connected to GitHub and Travis	25		✔	✔
Train new associates				✔
Can install and maintain a TeX distribution locally (*i.e.* not be reliant on ShareLaTeX)				✔
Detect non-ASCII characters from conversion and correct				✔
Run `pandoc`	28			✔
Raise issues with `.cls` file or `grattanReporter` on GitHub				✔
Setup ShareLaTeX account for new staff				✔
Writing				
Use all commands in Table 0.2	11	✔	✔	✔
Add caption, subtitle, notes and source	36	✔	✔	✔
Add reference to bibliography	48	✔	✔	✔
Add text emphasis (*e.g.* italics, bold)	32	✔	✔	✔
Edit text, including heading structure	32	✔	✔	✔
Insert big/small box	41	✔	✔	✔
Insert cross-reference (understand difference between `Cref`, `Vref`)	69	✔	✔	✔
Insert dot points or numbered items	33	✔	✔	✔
Insert footnote	33	✔	✔	✔
Insert footnote containing citations using ShareLaTeX search function	48	✔	✔	✔
Insert new chart	36	✔	✔	✔
Insert quote	34	✔	✔	✔
Insert url using `\url`		✔	✔	✔
Resolve basic compile errors	86	✔	✔	✔
Understand basic syntax (*e.g.* comments, space between paragraphs)	33	✔	✔	✔
Upload PDF containing charts		✔	✔	✔
Use LaTeX special characters correctly (*e.g.* \$, %, en-dash)	11	✔	✔	✔
Use ShareLaTeX track changes and comments feature		✔	✔	✔
Use commands for common abbreviations (`\eg, \ie, \etc, \dots`)	11	✔	✔	✔
Use correct quote marks	66	✔	✔	✔
Add 'draft' or 'embargoed' to cover/header	29		✔	✔

Continued on next page

Competency	Page ref.	PD / Fellow / Editor	Associate	LaTeXnician
Add 'submission' option to \documentclass as req.	29		✔	✔
Create table using Excel2LaTeX	38		✔	✔
Insert appendices	34		✔	✔
Insert citations with page numbers, or figure references	45		✔	✔
Insert complex chart (*e.g.* whole column, whole page, double column, top of column)			✔	✔
Insert report number	28		✔	✔
Invoke non-breaking spaces	33		✔	✔
Navigate this document and online resources to find answers			✔	✔
Uses [H] to put figures and charts inside boxes	42		✔	✔
Run checkGrattanReport from R, including pre-release/release	59		✔	✔
Understand bibliography entry types and fields, enter authors correctly	45		✔	✔
Understand default formatting in LaTeX and potential bugs			✔	✔
Use correct cross-references for chapters (\Chapref)	43		✔	✔
Use efficient coding practices (*e.g.* sentence/footnotes/footcite on new line)			✔	✔
Add packages to preamble as required				✔
Can change the vertical alignment of cells in a table				✔
Compare documents between arbitrary dates				✔
Create table from scratch in LaTeX				✔
Diagnose and resolve complex compile errors				✔
Insert a float immediately after chapter title				✔
Insert equations				✔
Modify table formatting in LaTeX	38			✔
Navigate through code from prior reports to work out complex formatting				✔
Respond to queries from other associates				✔
Run pdflatex and biber binaries from the command line				✔
Understand 'underfull/overfull vbox/hbox' warnings and when to address them				✔
Use \cmidrule and understand the (lr) option				✔
Use \multicolumn				✔
Format columns using specifications from the array package, such as @{} >{\RaggedLeft\arraybackslash}				✔
Use longtable (including continued captions, 'continued on the next page' ornaments)				✔

Competency	Page ref.	PD / Fellow / Editor	Associate	LaTeXnician
Publication				
Edit authors and acknowledgements	28	✔	✔	✔
Move charts			✔	✔
Suggest rephrasing paragraphs to provide better page breaks and hyphenation				✔
Use \pagebreak, \clearpage, \eject				✔
Correctly place \CenturyFootnote	77		✔	✔
Ensure report meets final check	59		✔	✔
Insert report number			✔	✔
Perform complex formatting requests				✔
Make judicious changes to the margins (\captionsetup, width=1.05\linewidth)	54			✔
Can clone a repository and checkout a local branch				✔

Table 0.2: List of all commands

\Command	Comment	Group
\boxsources	Source matter (not footnotes) within boxes	Boxes
\citeauthor	Inserts the author of a citation.	Citations & bibliography
\citetitle	Inserts the title (possibly shortened) of a citation.	Citations & bibliography
\footcite	Citation to be placed in a footnote	Citations & bibliography
\footcites	Multiple citations to be placed in a footnote	Citations & bibliography
\footnote	Insert a footnote.	Citations & bibliography
\textcite	Inline citation	Citations & bibliography
\textcites	Multiple citations to be placed inline	Citations & bibliography
\Vref	Initial cross-reference (to a \label)	Cross-referencing
\Cref	Subsequent cross-reference (to a \label)	Cross-referencing
\Chapref	Cross-reference to a chapter	Cross-referencing
\ref	The counter of a target (say a footnote)	Cross-referencing
\vpageref	Reference to a page (including preposition).	Cross-referencing
\label	The target of a cross-reference.	Cross-referencing
\phantomsection	If the target of a cross-reference is not a figure, table, or section (*i.e.* it is just text in a paragraph), use \phantomsection\label<key> to anchor the cross-reference	Cross-referencing
\bottomrule	Final horizontal rule in a table	Figures and tables
\caption	General caption (grey, bold)	Figures and tables
\cmidrule	Horizontal rule over a subset of columns	Figures and tables
\columnwidth	Supplies the current width of the column	Figures and tables
\doublecolumnfigure	Put two figures adjacent on the one page	Figures and tables
\includegraphics	inserts an image (typically a pdf) using the file provided	Figures and tables
\linewidth	Current width of line	Figures and tables
\midrule	Horizontal rule separating heading from contents in a table	Figures and tables
\multicolumn	Spread a cell over multiple columns (merge cells)	Figures and tables
\notes	Puts notes under a chart	Figures and tables
\source	Puts source text under a chart	Figures and tables
\noteswithsource	Puts notes and source under a chart/table	Figures and tables
\toprule	First horizontal rule in a table	Figures and tables
\units	Units for charts	Figures and tables
\emph	Emphasize text with an oblique font	Fonts
\textbf	Boldface	Fonts
\textit	Italic font (oblique font for helvet)	Fonts
\item	New number or bullet in an enumerate or itemize environment	Lists
\ie	Macro for consistent use of 'i.e.'	Misc
\eg	Macro for consistent use of 'e.g.'	Misc

\Command	Comment	Group
\etc	Macro for consistent use of 'etc.'	Misc
\input	Used to insert raw .tex code from another file	Misc
\addchap	Chapter without number	Sections
\chapter	Begins a new chapter, first argument the title of the chapter	Sections
\section	Section title	Sections
\subsection	Subsection title	Sections
\addbibresource	The path of the bibliography (.bib) file containing the references	Single-use
\acknowledgements	Text appearing in second column of page 2	Single-use
\author	The authors of the report	Single-use
\contentspage	Prints the table of contents and the list of figures	Single-use
\documentclass	Used at the top document. Loads the class (grattan)	Single-use
\GrattanReportNumber	Prints the report number on page 2. Use \GrattanWorkingPaperNumber for working papers	Single-use
\listoffigures	Print list of figures	Single-use
\listoftables	Prints list of tables	Single-use
\printbibliography	Prints bibliography	Single-use
\title	The title of the report	Single-use
\$	\$ for a (literal) dollar sign	Special characters
\%	\% for a (literal) percentage sign	Special characters
\&	Literal ampersand logogram	Special characters
\dots	ellipsis (…)	Special characters
\,	Half-space kern	Technical
\@	Use \@ before a sentence-ending full stop preceded by a capital letter	Technical
\(	Use \(to begin math-mode. You should type \(-\) if you want a negative symbol.	Technical
\\	Line break in table	Technical

Table 0.3: List of environments

Places a floating figure with caption, notes, and source.

```
\begin{figure}
\caption{Title}\label{xrefkey}
\units{Units}
\includegraphics{path/to/figure}
\noteswithsource{Notes}%
{Source}
```

Places a floating table with caption, notes, and source.

```
\begin{table}
\caption{Table caption}
\begin{tabularx}{\linewidth}
\toprule
ColumnHeader1 & ColumnHeader2 \\
\midrule
Table entry 1 & Table entry 2 \\
\bottomrule
\end{tabularx}
\notes{}
\source{}
\end{table}
```

Page of overview and recommendations.

```
\begin{overview}

\end{overview}
\begin{recommendations}

\end{recommendations}
```

Enumerated and bulleted lists

```
\begin{enumerate}
  \item
  \item
\end{enumerate}

\begin{itemize}
  \item
  \item
\end{itemize}
```

Table 0.4: List of boxes

Full-page box	`\begin{bigbox*}{`*`<Box title>`*`}{box:`*`<xref-key>`*`}`
	
	 `\end{bigbox*}`

One-column box	`\begin{smallbox}{`*`<Box title>`*`}{box:`*`<xref-key>`*`}`
	
	 `\end{smallbox}`

Small box centred in the page	`\begin{centredsmallbox}{`*`<Box title>`*`}{box:`*`<xref-key>`*`}`
	
	 `\end{centredsmallbox}`

Small unnumbered box	`\begin{centredsmallbox}{`*`<Box title>`*`}{box:`*`<xref-key>`*`}`
	
	 `\end{centredsmallbox}`

Box sharing column with body text	`\begin{verysmallbox}{`*`<Box title>`*`}{box:`*`<xref-key>`*`}`
	
	 `\end{verysmallbox}`

Part I

LaTeX in general

1 Prologue

Interpreting code examples

In this manual, examples of code are written using a listing:

```
LaTeX code with some \markup.
\begin{environment}

\end{environment}
```

or inline: `\TeX{}`.

Code examples can be, for want of better terms, *complete* or *illustrative*. **Complete** code means the code should be copied-and-pasted directly into the input file without modification, whereas **illustrative** code should be modified based on the desired output. For example, if an author wishes to increase the gap between columns in the overview by 2 mm, the code excerpt below is complete. The author should copy and paste the following, placing it before `\begin{overview}`:

```
\newlength{\overviewextra}
\setlength{\overviewextra}{2mm}
\addtolength{\columnsep}{\overviewextra}
```

In contrast, in an illustrative version of the above, the author is offered a choice for the gap between columns. In illustrative code examples, such options are coloured violet, slanted, and delimited with chevrons:

```
\newlength{\overviewextra}
\setlength{\overviewextra}{<extra column width>}
\addtolength{\columnsep}{\overviewextra}
```

Text coloured blue is simply syntax highlighting and has no special meaning. All TeX documents are written in plain text (although your text editor/IDE may offer or display similar syntax highlighting).

The name of the game

LaTeX is technically a package of the 1978 computer programme TeX. The language used by your computer to set the words on the page is called TeX; the *engine* used to convert this to a pdf is called pdfTeX, and the language you write in is called LaTeX.

TeX was written – recursively – in order to typeset its own user manual.[1]

In all cases, the TeX is pronounced $\tau\epsilon\chi$, similar to *tech-* as in *technology* but the X is pronounced as a voiceless velar fricative, like the final sound in *loch* or *Bach*.

Your interface in which you write LaTeX is called an IDE (integrated development environment). The particular IDE we recommend is called ShareLaTeX, which is an online SaaS provider of LaTeX.

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[1]Knuth, D. (1984) *The TeXbook*, Addison-Wesley Professional.

Some principles for erstwhile MS Word users

Learning LATEX as an MS Word user is a frustrating, confusing, rewarding, and ecstatic experience. There are some principles that are inviolate for novices.

1. Don't worry about the appearance of your document as your write. Write what you mean. MS Word is a What You See Is What You Get editor. LATEX is a What You See Is What You *Mean*.

2. LATEX takes an author's input and sets out the document's appearance using the author's raw input, the author's advice about how the document should look, and a set of parameters and algorithms that govern tradeoffs concerning document appearance.

3. The `grattan.cls` template is designed so that authors do not have to make any layout or typographic decisions.

4. LATEX is a butler, not a robot. It may not do exactly as you say, but it will do what you mean. When it doesn't, it either means

   - You've given it a nonsensical instruction

   - Your instruction contradicts another instruction

   - Your instruction contravenes good typographic design, as it sees fit

5. LATEX is a butler, not a slave: it is a partner in document preparation. In general, your responsibilities should not overlap: you decide the content and it decides the form. Where your responsibilities do overlap, you should seek to *advise* LATEX, not to *order* it. Further, you should be as gentle as possible with your advice. Only forcefully advise when the document will not require amendments and you are sure LATEX is wrong.

6. LATEX is a computer program, not a human. Despite the previous points, there are limits to what LATEX can do. In particular, LATEX cannot reword paragraphs. If you ask for five figures and a box to appear on one page, no software can save you. The lesson is not that LATEX is limited (though it does have weaknesses[2]) but that changing the actual words, charts, etc you give it can have a dramatic effect on appearance.

7. Don't manually position figures, tables, or boxes. Let them float in the document. It is nearly certain that the initial placement will be odd. As long you have used a `figure`, `table` or `*box` environment, they will float into good positions. For errant figures, tables, or boxes, wait until the document is completely finished before advising positions.

8. Don't do any of the following:

---

[2]See   http://tex.stackexchange.com/questions/27440/what-cant-tex-do   and   http://tex.stackexchange.com/questions/70901/typesetting-limitations-of-latex?noredirect=1&lq=1.

a) Insert horizontal or vertical whitespace, including manual line-breaks (except in tables)

b) page- or column-breaking

9. Do not ignore errors (*i.e.* things that prevent compilation). Any errors which you can't resolve in less than 60 seconds should be referred to Cameron Chisholm or Hugh Parsonage. Preferably attach what you think caused the error.

10. Take note of warnings from time to time. Warnings relating to bibliographies should be fixed immediately. Other warnings are typically just hints that manual intervention may improve the layout – resolving them can be deferred.

11. Beware special characters.

When you want this …	… type this.
$	\$
%	\%
"	`` (button above Tab)
"	''
(similarly for single-quotes)	
– (en-dash)	--
— (em-dash)	---
− (minus sign)	\(-\)

12. The grattan class file assumes your input is encoded in `UTF-8`. Avoid copying from MS Word to `.tex` files. Otherwise, special characters above will creep in silently. If you must, use `pandoc`.

13. Use `%` for comments.

Getting help (if this manual doesn't)

Consult us. Our preferred way is via the slack channel: grattex.slack.com You can use code-markup there to share your code (or alternatively the link to your project). Doing this way allows knowledge to be shared throughout the organization.

Alternatively, googling `latex` *`<what the problem is>`* is generally fruitful.

The site tex.stackexchange.com is an excellent resource for LaTeX problems. It is not generally suitable for debugging problems specific problems (like where you have misspelled a command name, or forgotten to close a brace), but is ideal for learning how to solve a general typesetting issue using LaTeX.[3] As with any community, take a bit

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[3]Hugh has used this a lot: you can see the questions he's asked as examples of what kinds of questions are suitable: https://tex.stackexchange.com/users/18414/hugh?tab=questions

of time to understand the etiquette and rules before posting. In particular, you should understand the concept of a *minimal working example* before you post. If your question is well-intentioned but not clear, expect prompt, firm but constructive criticism. That being said, they are one of the kinder and more forgiving coding forums in the stackexchange system.

For ShareLaTeX problems, use their Contact Us facility. We have found them very prompt and helpful.

2 Basics of LaTeX

2.1 Compilation

The process of LaTeX is basically:

1. Start with a plain text file with the file extension `.tex` in a directory/folder

2. Run the `pdflatex` program on that file.

3. The program outputs a pdf file `myfile.pdf` or returns an error.

In ShareLaTeX, the plain text file is viewed on a browser. The act of pressing the Compile button is equivalent to running `pdflatex` on that file.

2.2 Commands and environments

2.2.1 Commands

A **command** starts with a backslash \ followed by one or more characters. The command's **name** is the string of characters after the backslash. A command may have zero or more mandatory arguments and zero or more optional arguments. Mandatory arguments are delimited by curly braces; optional arguments by square braces

```
\somecommand[<optional arg>]{<mandatory arg1>}{<mandatory arg2>}
```

Note: Whitespace after commands with zero arguments is *ignored*. So

```
\LaTeX is a macro package.
```

will typeset:

> LaTeXis a macro package.

(Note that there is no space between LaTeX and 'is'.) On reflection, this is understandable: a command is defined by letters, so a space after a command in effect defines the name. But because it's a typesetting program, always having a space would make some things impossible. For example, 'This is typed in LaTeX.' would have a space between LaTeX and the full stop.

To indicate that a space should follow such a command, use either

```
\LaTeX{} is a macro package.
```

wherein the use of braces tells the compiler the command name has finished, or

```
\LaTeX\ is a macro package.
```

Note that `\LaTeX\` is not a single command. Rather `\LaTeX` is one command; and `\` itself is another command that inserts an explicit space.

Below is a table of some commands and their arguments:

Table 2.1: Examples of commands and their arguments

Command	Arguments	Description
\$	0 mandatory 0 optional	**Prints** the $ sign
\textbf	1 mandatory 0 optional	Prints its argument in boldface.
\\	0 mandatory 1 optional	Forces a line break, with optional extra space
\footcite	1 mandatory 2 optional	Cites its mandatory argument, with optional pre- or post-notes (such as page numbers)
\footcites	n mandatory $2n + 2$ optional	Multiple footcites

2.2.2 Environments

An **environment** looks like

```
\begin{environment}
 ...
\end{environment}
```

It may have mandatory or optional arguments, which occur immediately after \begin{environment}.

Table 2.2: Examples of environments

Environment	Arguments	Description
document	none	The contents of the document.
figure	1 optional	Creates a section of a document which "floats" above the body of the text. Captions and cross-reference labels within a figure environment will refer to the figure. The optional argument restricts the placement of the figure on the page.
quote	none	Used to designate a long quote with additional margin.
smallbox	2 mandatory, 1 optional	Creates a box, limited to one column. The first argument is optional and specifies the position of the box. The second argument is mandatory and specifies the title of the box, the third argument is also mandatory and specifies the cross-reference label of the box.

2.3 ShareLATEX

2.3.1 Miscellaneous

1. By default, the browser will display misspellings using the en-US dictionary. To change this, go to Menu, and next to Spelling change the language.

Part II

User guide to the Grattan report class

2.4 Starting a report

To start a Grattan report, working paper, or submission, you can either

1. email Hugh Parsonage, Cameron Chisholm, Andrew McDonald, or Brigitte Phelan and ask to be setup, letting them know:

   a) a suitable name for the repository

   b) the contributors

   The contributors can be changed after the report is set up. But the repo name cannot. Accordingly, it is important that you choose a name that is evocative of the project, unique, and will have a long shelf-life.

   Experience has shown that it can be difficult to predict the final title or even publication *year*, it's best to refer to the subject of the report rather than a quippy title. Use the following repository naming convention:

   `<Program>-<Start year>-<Report subject>`

   Archived reports should use the prefix zzz.

2. They will perform the following steps:

   a) Visit `https://travis-ci.org/HughParsonage/grattex.svg?branch=master` and verify: `build passing`. If it shows another image (or no image), please do not proceed (as the report template is broken) and contact Hugh Parsonage as the repository owner.

   b) Ensure you have been added to the `https://github.com/grattan` organizational account.

   c) Copy `https://github.com/HughParsonage/grattex` to your clipboard

   d) Visit `https://github.com/new/import`

   e) Paste `https://github.com/HughParsonage/grattex` into the **Your old repository's clone URL** field.

   f) Change **Owner** to grattan.

   g) Choose an evocative name for your repository under **Name**

   h) Select **Private**

   i) Click **Begin Import**.

   j) You will be taken to a new page showing import progress. After the import is complete, follow the link which appears.

k) Click the `.travis.yml` file and edit the notifications section as indicated in the image below. See Section 13.2 on page 79 for the notifications settings. Add authors' emails and #*<programme channel>* to the slack notifications line.

Choose **Commit directly to the `master` branch** and press **Commit changes**.
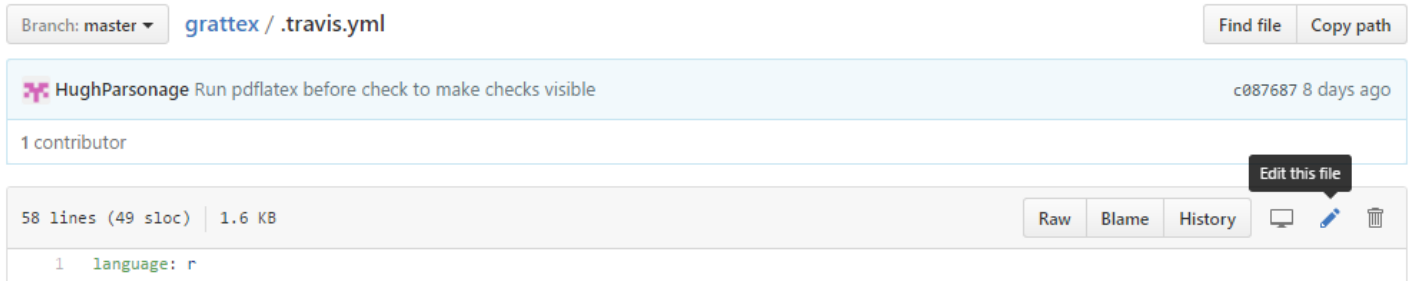
l) Click the Settings Tab.
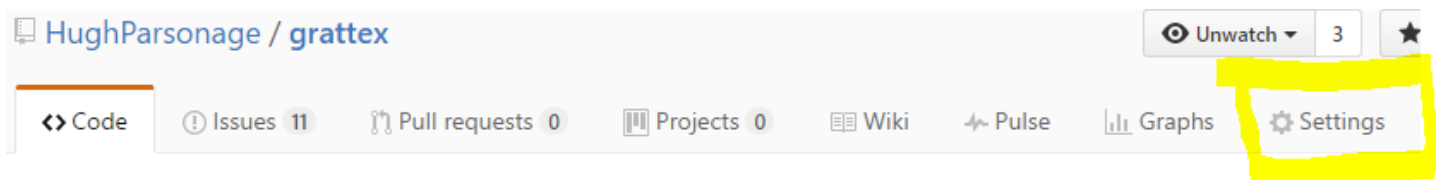
m) On the left, click `Collaborators`.

n) Add `HughParsonage` and any other authors as desired.

o) Visit sharelatex.com.

p) Click `New Project > Import from GitHub`.

q) Locate the repository you just created, and click `Import to ShareLaTeX`.

r) If ShareLaTeX fails to compile, this is a bug. Otherwise, proceed. (The first compilation should take several minutes, resulting in a document around 150 pages.)

s) At the top right, click `Share`.

t) Add collaborators as desired.

u) Go to `https://travis-ci.com/profile/grattan/`. Find the repository you just added and flick the switch on.

v) Return to ShareLATEX, comment out the \nocite{*} and sync to GitHub.

Figure 2.1: Report infrastructure schematic
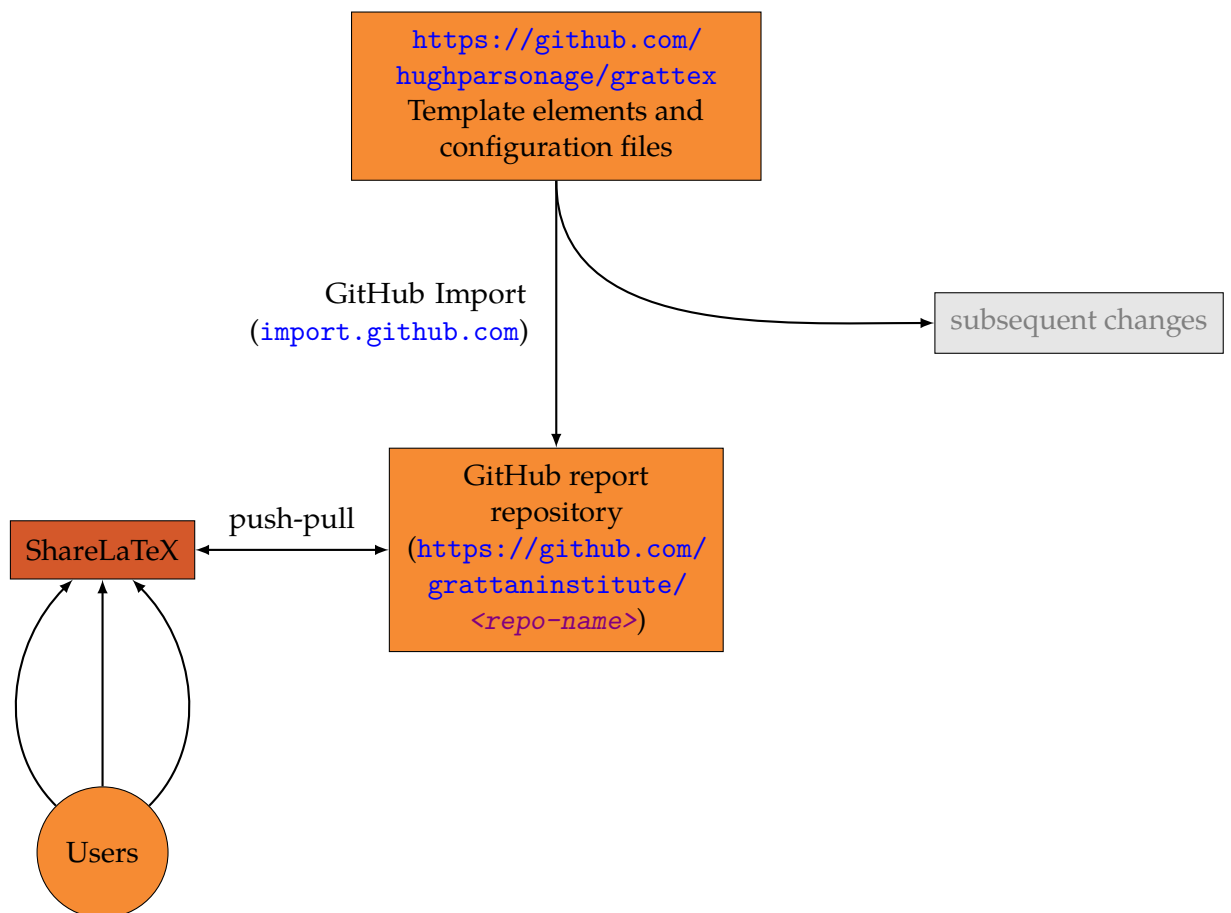
2.5 Using `pandoc`

pandoc comes installed with RStudio. To convert `orig.docx` to `new.tex`, run from the directory containing `orig.docx`.

```
pandoc -s orig.docx -s --wrap=none --top-level-division=chapter -o new.
    tex
```

2.6 The preamble

The **preamble** is everything outside the `document` environment. (*i.e.* everything before `\begin{document}`.

In every LaTeX document, you must have

1. The *command* `\documentclass` and a valid document class. In our case, use

   ```
   \documentclass{grattan}
   ```

2. A `document` environment.

That is, every LaTeX document must have the following three lines.

```
\documentclass{<style>}

\begin{document}

\end{document}
```

2.6.1 Grattan-specific preamble

So that reports look alike, a particular preamble is required that loads the Grattan style. If you imported the package from GitHub using the instructions on page 25 your report already meets the requirements described below.

Your preamble must have the following lines.

```
\documentclass[<options>]{grattan}

\title{<Title of the report>}
\author{<Authors>}

\GrattanReportNumber{<number>} %% or
\GrattanWorkingPaperNumber{<number>}

\addbibresource{bibliography.bib}
```

You can also have a subtitle which you invoke using `\subtitle`. The subtitle does not appear in the running headers.

2.6.2 Other requirements

The `.tex` file must be in a directory containing:

1. The `grattan.cls` file, which creates the document according to the Grattan template.

2. The folder `FrontPage` which must contain: `release`

   a) A file `FrontPage.pdf`

3. The following files (possibly in a subdirectory `logos/`):

   ```
   aus-gov-logo-stacked-black.pdf      Bhp.pdf
   GrattanSVGLogo.pdf
   UOM-Pos_S_PMS.pdf                   Vic_Gov_Logo-2016.pdf
   ```

4. For almost all reports, you will need to have a `.bib` file. The grattex repository comes with a `Grattan-Master-Bibliography.bib` file in the `bib` subdirectory, containing most extant works previously cited in reports.

2.6.3 Class options

You can invoke one of the following options by writing

```
\documentclass[<options>]{grattan}
```

for example,

```
\documentclass[FrontPage]{grattan}
\documentclass[FrontPage,continuous]{grattan}
```

embargoed Issue an embargoed mark on the title page and in the running heads. Enlivens the following commands:

1. \EmbargoDate The date printed in the embargo fields. By default, XXXX.

2. \EmbargoText The embargo field printed in the running heads and on the title page (unless \EmbargoTitleText is set). By default `Embargoed until 9 pm \EmbargoDate{}`.

3. \EmbargoTitleText The text printed on the title page (as distinct from the running heads). By default, \EmbargoText{}.

submission Document is a submission to inquiries. Omits page 2.

FrontPage Use the pdf in the location `./FrontPage/FrontPage.pdf` as page 1, rather than a generic one.

continuous Use continuous numbering for figures and tables, rather than resetting after each chapter.

3 Basic report elements

3.1 Front matter

3.1.1 Acknowledgements page

Acknowledgements are written in the preamble of your document, using the command
`\acknowledgements`:

```
\acknowledgements{%
This report was written by no-one.
Hugh Parsonage made significant contributions to the report.

We are grateful to everyone.

Please do not cite this work.
}
```

Acknowledgements are not printed when the **submission** option is selected, and selecting
this option while also invoking `acknowledgements` will result in a warning.

3.1.2 Overview / Summary / Preface

Use

```
\begin{overview}
 ...
\end{overview}
```

for your overview.

You can also use `\begin{summary}` as required. If you want to use a different word to
Overview, ask us — it is straight-forward to amend.

3.1.3 Recommendations page

Similarly, use

```
\begin{recommendations}
 ...
\end{recommendations}
```

for your page or pages of recommendations. Use \recommendation to title individual recommendations within this environment.

3.1.4 Contents page(s)

Write

```
\contentspage
```

After your overview and recommendations.

3.1.5 Lists of figures and tables

Use

```
\listoffigures
\listoftables
\listofboxes
```

after \contentspage to insert the lists as desired.

3.2 Main matter

3.2.1 Chapters, section, subsections

To start a new chapter, write

```
\chapter{<chapter title>}
```

Similarly,

```
\chapter{<section title>}
\section{<subsection title>}
\subsection{<subsubsection title>}
```

Title commands increment as expected, except for \subsubsection which has no counter (*i.e.* it is printed without a number).

3.3 Miscellaneous text elements and font

3.3.1 Boldface, italics

In general, you should write what you *mean*, not what you want displayed. So avoid directly instructing LaTeX to bold or italicize test. Instead, write macros explaining *why* you are using a different font.

That said, you can use \textbf{<text>} to make <text> boldface and \textit{<text>} to make <text> italic. You can also use \emph to *emphasize* text.

3.3.2 Paragraphs

Use a blank line to mark a new paragraph. For example

```
A well-designed GST reform package could support economic growth, make
    the tax and transfer system more progressive and give state and
    Commonwealth governments more budgetary options.

Proposals to extend or broaden Australia's 10 per cent goods and
    services tax (GST) have been perennial. Current governments face
    many challenges, such as funding growing healthcare costs,
    reducing deficits, and cutting inefficient taxes. A higher GST
    could fund any of these initiatives -- although perhaps not all of
    them.
```
N.B.: The indent here means a continued line. There are only three lines of code illustrated here.

In the above example, *Proposals to extend* will begin on a new paragraph.

3.3.3 Non-breaking spaces

Use ~ for a non-breaking space: \$40~million.

Use `\nobreakdash-` for a non-breaking hyphen: 2013\nobreakdash-14.

3.3.4 Footnotes

Use `\\footnote`{`<text>`} to insert `<text>` into a footnote.

3.3.5 Numbered / bulleted lists

Use enumerate (for numbered lists) and itemize (for bulleted lists)

```
\begin{enumerate}
 \item First numbered item
 \item Second numbered item
 \begin{enumerate}
  \item First item in a nested list
 \end{enumerate}
 \item Third numbered item
\end{enumerate}

\begin{itemize}
  \item First bulleted item
  \item Second bulleted item
```

```
  \begin{itemize}
   \item First nested bulleted item.
  \end{itemize}
 \end{itemize}
```

3.3.6 Quotes and dicta

To insert an extended quote, use the `quote` environment.

```
\begin{quote}
  One of the reasons that clinicians struggle to form
  partnerships with patients and consumers is that
  there is inadequate information for proper informed
  consent. The numbers that are collected don't filter
  through to clinicians dealing with the patient, and
  certainly not to the patient themselves. I encourage
  people to ask doctors three questions: `What are my
  options?', `What are the treatment outcomes -- both
  benefits and risks?', and `How likely are those
  outcomes to happen to me?'. Doctors though say `We
  just don't have that information'.
\end{quote}
```

3.4 Back matter

3.4.1 Appendices

To start an appendix, type `\appendix`.

```
    \appendix
```

to mark the end of the main matter and the start of the appendices. Then use `\chapter{`*`<appendix title>`*`}` to title the appendices.

3.4.2 Bibliography

Invoke

```
    \printbibliography
```

where you want the bibliography (almost always at the end of the document). See Chapter 5 on page 45 for help on actual citation and bibliography management.

For example:

```latex
\documentclass{grattan}

\title{Brief report}
\author{Me}

\begin{document}

\begin{overview}
In this report, we found all is well.
\end{overview}
\contentspage
\chapter{Australia is fine}
Australia is fine.
\chapter{How do we know this}
Grattan analysis of ABS (2016).
\section{Limitations of analysis}
Our analysis is wrong.

\chapter{Options for reform}
Tidy desk.
\appendix
\chapter{International comparisons}
\printbibliography
\end{document}
```

4 Floats: figures, tables and boxes

4.1 Figures

Before you insert a figure, you need to create your image (say in PowerPoint). Your file should be saved as a pdf, though almost all image types are supported. If you are using PowerPoint to create your charts, ensure the pdf has the fonts embedded. Move the pdf file to the atlas directory of your report. This directory should be placed in the same directory as your `.tex` file.

Once the image is ready, use the following structure to insert a figure.

```
\begin{figure}
 \caption{<main caption>\label{<cross-reference key>}}%
 \units{<secondary caption/y-axis label>}
 \includegraphics{atlas/image-filename}
 \noteswithsource{<Notes of the chart>}%
 {<Source information>}
\end{figure}
```

Alternatively, you can save your charts in a single pdf, with each page having a different chart. To refer to the 3rd page in your pack `<chart-pack-filename.pdf>`, use:

```
 \includegraphics[page=3]{atlas/<chart-pack-filename.pdf>}
```

Use `\caption` for the boldface caption and `\units` for the non-bold (secondary) caption. Use `\label` to mark the cross-reference key target, which should be inside the argument to `\caption`.

Use `\noteswithsource` to put the notes and source under a figure (or table). Note this command has two mandatory arguments. Use `\notes` if you have notes but no source; and `\source` if you have a source but no notes.

To set two figures on the same page use the `\doublecolumnfigure` command:

```
\doublecolumnfigure{%
    \caption{<main caption>\label{<cross-reference key>}}%
    \units{<secondary caption/y-axis label>}
    \includegraphics{atlas/1st-image-filename}
    \noteswithsource{<Notes of the chart>}%
    {<Source information>}
}{
```

```
    \caption{<main caption>\label{<cross-reference key>}}%
    \units{<secondary caption/y-axis label>}
    \includegraphics{atlas/2nd-image-filename}
    \noteswithsource{<Notes of the chart>}%
    {<Source information>}
}
```

Note that you do not use the `figure` environment in this command. (The figure environment is part of the command definition.)

4.2 Tables

To construct a table, use the `table` and `tabularx` environments.

```
\begin{table}
\caption{<Caption to the table>}
\begin{tabularx}{\columnwidth}{<alignment parameters>}
\toprule
Header1 & Header2 & Header3 \\
\midrule
First row & First row & First row \\
Second row & Second row & Second row \\
...
Last row & Last row & Last row
\bottomrule
\end{tabularx}
\noteswithsource{<Notes>}%
{<Source>}
\end{table}
```

Like with figure, we put the contents of this float in an environment called `table`. The `\begin{table}` ... `\end{table}` simply tells LaTeX to float the placement, to use "Table N:" in the caption, and possibly to note it in the list of tables. It does nothing to actually construct the table.

The actual construction of the table is handled by `tabularx` which is very similar to the standard `tabular` environment. Its first argument is the width of the table and its second argument is the *alignment parameters* of the tabular's columns:

The `<alignment parameters>` determine the alignment of the columns,

Inside the tabular, use the ampersand & to move to the next column and the double-backslash \\ to move to the next row. Use \toprule before the first row, \bottomrule after the last row, and \midrule to separate the headers from the rest of the table.

Table 4.1: Alignment parameters and their meanings

l	left-aligned text
c	centred text
r	right-aligned text
p{`<width>`}	left-aligned wrapped text of width `<width>`
m{`<width>`}	left-aligned wrapped text of width `<width>`, vertically centred-aligned
b{`<width>`}	left-aligned wrapped text of width `<width>`, vertically bottom-aligned
>{\centering\arraybackslash}p{`<width>`}	centred wrapped text of width `<width>`
>{\raggedleft\arraybackslash}p{`<width>`}	right-aligned wrapped text of width `<width>`

4.2.1 From Excel

Most authors would be well-advised to quickly write their tables in Excel and then use Excel2LaTeX.

To start using Excel2LaTeX:

1. Go to https://www.ctan.org/pkg/excel2latex?lang=en

2. Download the contents of this package

3. Unzip the archive.

4. Enable the add-in for your version of Excel. (*e.g.* https://support.office.com/en-us/article/Add-or-remove-add-ins-0af570c4-5cf3-4fa9-9b88-403625a0b460)

5. Activate the add-in (see Excel documentation for your version).

6. Open the Add-Ins tab in Excel, and, with the sheet containing your table open, click `Convert table to LaTeX`.

7. The defaults are usually sensible. Click Copy to clipboard and paste into your `.tex` source file.

Once you have copied the table, you should make the following adjustments:

1. Use \begin{tabularx}{\linewidth} instead of \begin{tabular} (be sure to also change \end{tabular} to \end{tabularx}.

   The `tabularx` environment creates a table of fixed width – in this case, the current width of the line. It achieves by stretching one or more of the columns. The author chooses which columns will be stretchable by replacing the corresponding alignment parameter with `X`.

2. So you should also change at least one of your columns' alignment parameters to `X`. By default, `X` has a ragged right edge (or is left aligned).

3. All `X` columns will stretch to the same width. So if a tabular's natural width is 80% of the line width, and you replace a single column's alignment parameter with an `X`, then that column will have an extra 20% of the line width added to its width. If, on the other hand, you replace two columns' alignment parameters with `XX`, those columns will each be widened by 10% of the line width.

4. If the column or columns you would like to stretch should be centre-aligned (with both edges ragged), not left-aligned, then instead of putting `X`, you should put >{\centering}X. If it should have a ragged left edge (be right-aligned), then you should put >{\RaggedLeft}X or (for a very ragged edge) >{\raggedleft}X.

More advanced

\cmidrule(lr){<m-n>}	to denote a horizontal rule between the mth and nth columns. The (lr) specifies that the horizontal rule should stop just short of the edges of the columns, to ensure adjacent \cmidrules have a visual breath between them.
\multicolumn{<n>}{<al.>}{<text>}	puts the <text> in a 'merged' cell from the current cell across <n> columns with horizontal alignment <al.>
\begin{tabular}{m{2cm}b{2cm}p{2cm}}	starts a table with 3 columns vertical aligned to the middle, bottom, and top.

4.2.2 Table styles

Rules of thumb:

1. Never use vertical rules in a table:

   a) right-align numeric columns,

   b) when comparing things across columns, use equal-width columns

2. Avoid using horizontal rules except the mandatory \toprule above the header, \midrule below the header, and \bottomrule below the table. To provide visual emphasis of grouped rows, use \\[<x>pt] on the last row of each group to specify the exact row skip, adjusting <x>pt optically.

3. Avoid repetition.

   a) If an element is repeated in a column header, put the repeated element above a cmidrule and the unique elements below.

b) If an element is repeated down rows, group the rows, and put the repeated element in an eastern column. Experiment with `\multicolumn` so that the row heading appears to hang over the other rows. If your table has no natural order, sort by an element repeated down rows.

c) Consider omitting repeated words altogether.

4. If a column should be in a particular font, use the array specifier, rather than manually specifying the column.

5. Numeric columns should be written in math mode (*i.e.* should be in tabular, lining font). In particular, digits should align vertically.

6. Use p cells for the body, b cells for the headings.

7. Don't push tables too far.

```
% Wrong:
\begin{tabularx}{Xl}
\textbf{State} & Population \\
\textbf{NSW}  & Very high \\
\textbf{Vic}  & High\\
\dots
\textbf{Tas}  & Low
\end{tabularx}

% OK:
\begin{tabularx}{>{\bfseries}Xl}
State & Population \\
NSW   & Very high \\
Vic   & High\\
\dots
Tas   & Low
\end{tabularx}
```

4.3 Advanced tables

4.3.1 Column formatting

For example,

```
\begin{tabularx}{\linewidth}{>{\bfseries}p{0.1\linewidth}lrRX>{
    \centering\arraybackslash}p{0.1\linewidth}}
```

This designates a six-column table:

`>{\bfseries}p{0.1\linewidth}` the first column is 10% of the width of the table with boldface text, with a moderately ragged right justification ('wrapped'),

l left-aligned text occupying the maximum width of the text,

r right-aligned text occupying the maximum width of the text,

R right-aligned paragraph text occupying the same width as X

X left-aligned paragraph text occupying the same width as R. Note that R and X columns stretch or shrink depending on the width of other columns to ensure the total width of the table equals `\linewidth`.

`>{\centering\arraybackslash}p{0.1\linewidth}` A centred column of paragraph text with 10% of the width of the table.

4.4 Boxes

4.4.1 `smallbox`

Use \begin{smallbox} to insert a box intended to fit on one column. There are two mandatory arguments.

```
\begin{smallbox}{<title of the box>}{box:<cross-ref key>}
 <contents of the box>
\end{smallbox}
```

4.4.2 `verysmallbox`

The very small box is used for boxes which may be sufficiently shorter than a column to share the column with paragraphs from the body text. Such boxes would contain two or fewer paragraphs.

4.4.3 `centredsmallbox`

The centred small box is used for a box the same size as `smallbox` but centred on one page, rather than being constrained to the left or right half of the page. Use this if a `smallbox` would otherwise be on a page on its own.

4.4.4 `addsmallbox`

Use the `addsmallbox` environment for a `smallbox` without box numbers.

4.4.5 `bigbox*`

Use \begin{bigbox*} to denote a big box.[1] The text will flow around the box.

---

[1]The * reflects a convention in LaTeX for a two-column float in an environment name.

Figures in boxes must use [H]

When you have a figure in a big box, you must use

```
\begin{figure}[H]
 ...
\end{figure}
```

to insert a figure.

Note the [H] which specifies that the figure is to be placed here (or rather, *HERE!*).

4.5 Cross-references

Each cross-reference has two elements:

1. An anchor for the cross-reference; where the reader is directed

2. The text of the cross-reference itself.

The anchor is always marked by \label. In most cases, the reader is being directed to an *numbered* element of the report – a section, a figure, a table, a box, *etc*. Such elements are known as **counters**. The label needs to be placed after the counter being referenced and before any other counter.

```
% OK:
\section{A section title}
See \Vref{fig:point-here}

\begin{figure}
\caption{The reader should see this figure}\label{fig:point-here}
\includegraphics{path/to/figure}
\notes{blah blah}
\end{figure}

% Wrong:
\section{A section title}
See \Vref{fig:point-here}

\begin{figure}
\label{fig:point-here}
\caption{The reader should see this figure}
\includegraphics{path/to/figure}
\notes{blah blah}
\end{figure}
```

In the latter example, the cross-reference would be to the section `A section title` because that was the most recent counter *before* the label.

In general, put the `\label` immediately after (or inside) the cross-reference target and on the same line. Putting the label on the same line is mandatory as a matter of style for references to \captions or chapters.

Whereas `\label` is the only way to anchor a cross-reference, there are multiple ways to create the text for the cross-reference text.

1. `\Cref` for a reference to the counter and the counter type (*e.g.* Figure 1.1)

2. `\Vref` for `\Cref` plus a phrase indicating the location of the counter if it occurs on a different page (*e.g.* Figure 1.1 on the following page)

3. `\Chapref` (and variants) same as `\Cref` but mandatory for references to chapters

Command	Prints as
`\Chapref{chap:intro}`	Chapter 1
`\Chapsref{chap:intro}`	Chapters 1
`\topref{chap:chap3}`	3
`\Chaprefrange{chap:intro}{chap:chap3}`	Chapters 1 to 3
`\Chaprefand{chap:intro}{chap:chap3}`	Chapters 1 and 3

4. `\vpageref` for a page reference only – without the counter (*e.g.* 'on the following page'). Whereas `\Vref` will suppress the page reference phrase if the target occurs on the same page, `\vpageref` will expand to 'on this page'.

   N.B. `\vpageref` includes a preposition so shouldn't follow a preposition.

   ```
   % OK:
   See the overview \vpageref{chap:overview}.
   %% ==> See the overview on page 3.

   % Wrong:
   See the overview on \vpageref{chap:overview}.
   %% ==> See the overview on on page 3.
   %%                        ^^^^^
   ```

For example, to refer to some figure, use the following template.

```
\Vref{fig:key} shows that ...

\begin{figure}
  \caption{The chart's caption\label{fig:key}}
  \includegraphics{thechartfilename.pdf}
\end{figure}
```

`\Vref`{fig:key} will expand to Figure N shows that ...

Your labels should be evocative of what is displayed, *not* the number. You will end up moving or removing a figure, table, or box and confuse your labels.

If you refer to a cross-reference that doesn't exist, the pdf will contain a bold `??` and the log file will contain a warning.

If you are referring to a chapter, you must use `\Chapref`.

The contents of `\label` can be anything containing letters, underscores, or hyphens. The house style requires the use of the prefixes in Table 4.2. Using these prefixes consistently will make auto-completion easier and is necessary for `grattanReporter` checks.

Table 4.2: Prefixes to use in cross-reference anchors, by float type

Float environ. command	Prefix	Example
figure	fig:	\label{fig:prop-hholds-by-decile}
table	tbl:	\label{tbl:tax-paid-by-bracket}
box	box:	\begin{smallbox}{A short history of dogs}{box:dogs}
footnote	fn:	\footnote{A footnote.\label{fn:my-footnote}}
chapter	chap:	\chapter{Introduction}\label{chap:intro}
addchap	chap:	\addchap{Or can it}\label{chap:Or-can-it}
recommendation	rec:	\recommendation{Do it}\label{rec:Do-it}
section	sec:	\section{The budget problem}\label{sec:budget-problem}
subsection	subsec:	\subsection{Change}\label{subsec:Change}
subsubsection	subsubsec:	\subsubsection{No}\label{subsubsec:No}
phantomsection	paragraph:	\phantomsection\label{paragraph:PROP-land-taxes}

5 Citations and bibliography

To cite works in LaTeX, you perform two steps:

1. create a database of the works you are citing, separate to the report, where each entry has a unique *key*, and then

2. cite the entry in the report using `\textcite{`*`<key>`*`}` or `\footcite{`*`<key>`*`}`

5.1 `bibliography.bib`

In LaTeX, The database is a text file, customarily having file extension `.bib`, containing entries for each work to be cited:

```
<@type>{<key>,
  <field 1> = {<field 1 value>},
  <field 2> = {<field 2 value>},
}
```

For example,

```
@TechReport{Minifie-Savage-Cameron-2014-Super-sting,
  author      = {Jim Minifie and Jim Savage and Tim Cameron},
  title       = {Super sting: how to stop Australians paying too much for
      superannuation},
  year        = {2014},
  institution = {Grattan Institute},
  url         = {https://grattan.edu.au/report/super-sting-how-to-stop-
      australians-paying-too-much-for-superannuation/},
}
```

The `grattex` repository ships with a file `bib/Grattan-Master-Bibliography.bib`, containing nearly 3000 prepared entries. Simply add new entries to this file as required.

5.1.1 Entering authors

1. To enter multiple authors, separate each name with `and` (as above)

2. You can enter the authors in `Forename Surname` or `Surname, Forename` form (even within the same entry). Note that a comma means the previous word is interpreted as a surname. In particular, you may write any of the following

   ```
   author = {John Daley and Danielle Wood}
   author = {John Daley and Wood, Danielle}
   author = {Daley, John and Wood, Danielle}
   ```

   but *not* any of the following

   ```
   author = {John Daley, and Danielle Wood}
   author = {Daley, John, and Wood, Danielle}
   ```

   this will cause a `Biber subsystem error`, which are notoriously difficult to track down.

3. To enter a author literally (*i.e.* prevent BibLATEX interpreting it as a name), you **protect** it using double braces:

   ```
   @TechReport{RMS2016Hunter,
     author      = {{NSW RMS}},
     title       = {The Hunter Expressway},
     year        = {2016},
     institution = {NSW Roads and Maritime Services},
     url         = {http://www.rms.nsw.gov.au/projects/hunter/the-
        hunter-expressway/index.html},
   }
   ```

4. I recommend entering authors in Forename Surname form. You should also endeavour to enter the first name of each author in full.

   Prevent erroneous idems and ibidems

5. Please enter human authors for institutional works, even if the work urges you to cite the institution as the author.

6. Avoid using `author = {{Commonwealth of Australia}}`, except in the context of international relations.

5.1.2 Nonstandard authors

Abbreviate the names of institutions when they appear in the author field:

ABS	Not †Australian Bureau of Statistics
ATO	Not †Australian Taxation Office
PC	Not †Productivity Commission
PBO	Not †Parliamentary Budget Office
D[A-Z]+	Not †Department of . . . unless the Department has a single portfolio *e.g. Department of Defence, Attorney-General's Department*. (Use *NSW D[A-Z]+ etc* if the Department is not a Commonwealth Department).
IRS	Not †Internal Revenue Service. (But "NZ Inland Revenue")
HM	For UK Departments of State
Treasury	Not Department of Treasury

Use *Hansard* in the author field for proceedings of the Parliament of Australia.

ABS entries

If you are citing an catalogue entry from the ABS:

- Include the catalogue number as a `note = `, not in the title.

- Only the most up-to-date version of time series data should be used, unless you are making a point about revisions to the entry.

```
@TechReport{ABS-2016-CPI-Dec,
  author      = {ABS},
  title       = {Consumer Price Index, Australia, Dec 2016},
  date        = {2017-01-25},
  institution = {Australian Bureau of Statistics},
  note        = {Cat. 6401.0},
  url         = {http://www.abs.gov.au/ausstats/abs@.nsf/mf/6401.0},
}
```

R packages

You should cite the R core team and all R packages that were attached for any analysis reaching publication. Use `knitr::write_bib` to generate the entries. If an R package has a poorly-written DESCRIPTION file that precludes a neat output from `knitr::write_bib`, *leave as-is.*

LaTeX

Do not cite your use of LaTeX, except in books as a colophon.

5.1.3 Dates and years

Enter the date if possible; the year if not. If you only have the month and year, you can enter the month as an integer.

Enter dates in standard unambiguous form `YYYY-MM-DD`.

5.2 Citations

5.2.1 LaTeX commands to insert a citation

Use `\footcite{`*`<key>`*`}` to cite an entry in the database if you want the citation to appear in a footnote. Use `\footcites{`*`<key1>`*`}{`*`<key2>`*`}` to cite multiple entries in the same footnote.

Use `\footcite[][18--24]{`*`<key>`*`}` to add a page reference (in this case, pages 18–24) as a postnote the citation. Use `\footcites{key1}[][44]{`*`<key2>`*`}` to cite `key1` and page 44 from `key2`.

Use `\textcite{`*`<key>`*`}` to cite a reference if the reference should not be footnoted. Similarly \textcites and `\textcite[][18--24]{`*`<key>`*`}` as with footcite.

5.2.2 ShareLaTeX

You should harness the bibliography search function in ShareLaTeX, rather than switching back and forth between your `.bib` file and your source file. To enliven the search function type `\textcite{` or `\footcite{` (as the case may be), then click Ctrl + Space or Cmd + Space on a mac (or as directed). In the search box that appears, start typing words from the document you want to cite.

Using the search box is not only more convenient, it also makes it more likely you will find an existing entry before adding a duplicate.

5.3 Troubleshooting

Troubleshooting referencing errors are more difficult than pure LaTeX errors, because the process involves a different program and this process occurs behind the scenes in ShareLaTeX.

If you encounter error messages that include words like 'malformed', most likely these problems can be fixed by rebuilding the cache.[1] In ShareLaTeX, click the button next to **Compile** with the orange number (or red number if there are errors), scroll to the bottom, hit the trash button, read the prompt and clear the cache. If you're compiling locally, you can achieve the same result by deleting all the auxiliary files in your project directory

---

[1]Such errors can occur if you interrupt a compile.

(*viz.* all the files with the same name as your `Report.tex` file, but with extensions like `.aux`, `.blg`).

If you get an error about "too many commas", you have probably entered an author or editor field with commas separating the authors, instead of `and`. That is, you've written

```
% Wrong
author = {John Daley, Danielle Wood, and Hugh Parsonage},
```

instead of

```
author = {John Daley and Danielle Wood and Hugh Parsonage},
```

6 Non-standard report elements

6.1 Comments, issues

We do not recommend using LaTeX to handle project-management, issue-tracking, or editing, as it fails to keep the publishable report elements separate from the production elements, and because LaTeX is not the best tool for such tasks. We recommend:

1. A formal issue tracker, in combination with a version control system, such as GitHub + git, integrated with a political structure to assign, review, and close issues.

2. Using the LaTeX comment character % to mark comments.

However, if you decide to mark up your pdf with these sort of editorial marks, you should clearly fence-off such usage from the content of your report you intend to publish.

6.1.1 `todonotes`

The package `todonotes` provides handsome comment features. To use todonotes, add the following in `tex/preamble`

```
\usepackage{todonotes}
% Person-specific margin comments
\newcommand{\cam}[1]{\todo[color=Color2,size=\tiny]{\textbf{Cam:} #1}\ }
\newcommand{\jim}[1]{\todo[color=Color3,size=\tiny]{\textbf{Jim:} #1}\ }
\newcommand{\lucy}[1]{\todo[color=pink,size=\tiny]{\textbf{Lucy:} #1}\ }

% Inline comments (for environments)
\newcommand{\cami}[1]{\todo[color=Color2,size=\tiny,inline]{\textbf{Cam:}
    #1}}
\newcommand{\jimi}[1]{\todo[color=Color3,size=\tiny,inline]{\textbf{Jim:}
    #1}}
\newcommand{\lucyi}[1]{\todo[color=pink,size=\tiny,inline]{\textbf{Lucy:}
    #1}}
\newcommand{\jamesi}[1]{\todo[color=Color1,size=\tiny,inline]{\textbf{
    James:} #1}}
```

Then place \cam{This paragraph is great!} for a margin note, clearly authored by Cam:, or \cami{This line is great!} for an inline comment. Note that you must use inline comments whenever the comment appears in a float, or a footnote.

6.1.2 `soul`

The package `soul` provides the commend \hl which highlights text.

Part III

Notes for the typesetter

7 Moving floats

1. If the author would prefer a float (figure, table, or box) to be placed in a different location in the document, you as the typesetter must first understand why the output routine has placed the figure where it has.

2. If it is clear that the output routine has averted a substantial typographic sin by placing the figure there, the author should be told of this.

3. Otherwise, the first step is to move the errant float forward or backward one or two paragraphs as required, noting that the order in which floats of the same type (*e.g.* figure) occur in the source file is preserved in the final document.

4. Next consider, in the following order:

   a) providing the options [htb] as required to the float environment

   b) providing the same options to the errant float's predecessor

   c) providing the same options to both the errant float and its predecessor

5. At this point, if the figure remains steadfast, you have encountered a very unusual situation, and I would encourage you to accept the result.

6. Otherwise: you should consider rewording captions or the surrounding text.

7. Next consider the use of \FloatBarrier

8. Then consider the option !.

9. As an emergency measure, you can manually place the figure using the option H.

10. As a last resort, consider using primitive TeX to manually place the figure with respect to the page. This should be the very last step in a publication.

8 Bad page break

Consider using:

1. `\pagebreak[1]` at a good/better place for line breaking:

2. `\enlargethispage{<n>\baselineskip}` or `\enlargethispage*{<n>\baselineskip}` where `<n>` is an integer multiple of 1/4.

8.1 Avoiding a linebreak

To avoid a linebreak, you should first revisit the paragraph or paragraphs prior to see if any of the text can be modified. (Remember that removing words may on rare occasions *increase* the number of lines the paragraph occupies.) If you cannot reword the paragraph, you can use non-breaking spaces *e.g.* `no~break` or use `\mbox{no break}` which creates an unbreakable box.

8.1.1 In captions

If a caption is slightly too long to fit on one line (say by one word), it is acceptable (indeed preferable) to modify the margins to allow the word to overflow into the margins. Use `\captionsetup{oneside, margin={0em,<x>em}}` for a suitable choice of `<x>`, which equals the extra width in units of em-dashes by which the caption will expand.

9 Excessive whitespace between paragraphs

This occurs when there is insufficient text to fill a page (the page is *underfull*) but moving text onto another page is not possible because:

- A section would be orphaned from its title
- A footnote would have to be set on a different page from its mark.

1. Reposition floats if useful.

2. Use \oneraggedpage:

```
% one page ragged bottom
\makeatletter
\newcommand{\oneraggedpage}{\let\mytextbottom\@textbottom
  \let\mytexttop\@texttop
  \raggedbottom
  \afterpage{%
  \global\let\@textbottom\mytextbottom
  \global\let\@texttop\mytexttop}}
```

3. Finally, use \raggedbottom on the entire document. Review.

10 Hyphenation

Hyphenation can be distracting and interrupt the text; however, the alternative to hyphenation is often worse.

When the text is typeset ragged right, LaTeX will actually be *more* inclined to hyphenate. If full-width justification on a paragraph can be used, it will minimize discretionary hyphens.

LaTeX will, by default, avoid hyphenating words, and desperately try to avoid putting discretionary hyphens on consecutive lines or at a page break.

If a paragraph in your report contains unsightly hyphenation (*i.e.* consecutive hyphens or hyphenation across pages), the best and perhaps only solution is to reword the paragraph.

There is one exception. The command

```
\setlength{\overviewExtra}{1mm}
```

will add 1 mm extra to the nominal column width in the overview. Try values from -4 mm to 4 mm to minimize hyphenations.

In the unlikely event that rewording the paragraph does not change the hyphenation, you can increase `\emergencystretch` to `0.5em`. Note that you in doing so are take responsibility for the typesetting of that paragraph. You may wish to play around with penalties, but you should do so with trepidation and only ever locally.

Never use `\raggedright` in ordinary body text. It is acceptable in text where each "paragraph" is really an isolated verse or element. For example, it is acceptable in a list of recommendations, in a table, or in the captions to figures. Although in deploying `\raggedright` you win certainly the battle regarding excessive hyphenation, you lose the war – the text can become badly ragged – and paragraphs will need to be reworded.

11 Balancing text across columns

Use \oneraggedpage\eject\addtolength{\parskip}{<extra-para-stretch>} N.B. in many instances (such as where the page contains a section title) it is not possible to balance columns.

Part IV

Style requirement: `grattanReporter`

12 User guide

12.1 Synopsis

Run

```r
# setwd("/path/to/your/report")
checkGrattanReport()
```

and follow the prompts until you receive the console message:

✔ `Report checked.`

Additional arguments are provided for increasingly thorough checks

1. For daily checking of citation keys, bibliography data model validation, and mistyped cross-references.

   ```r
   checkGrattanReport(compile = TRUE)
   ```

2. For checks of a report that is intended for distribution, but not necessarily for release: that the template is up-to-date, the 100th footnote and beyond are correctly formatted, the ISBN is inserted and valid, and there are no editorial marks in the document

   ```r
   checkGrattanReport(compile = TRUE, pre_release = TRUE)
   ```

3. For checks of a report for release: embeds the fonts and copies the file to the `RELEASE` folder. Also ensures the embargo marks are absent.

   ```r
   checkGrattanReport(compile = TRUE, pre_release = TRUE, release = TRUE)
   ```

You must *fix* all errors with `release = TRUE` before a report can be released to the main report area on http://grattan.edu.au/. Ideally, a report should pass the check with no warnings or notes of any kind. If the check emits a `NOTE`, you must *address* this `NOTE` before report acceptance.

How to read this part

Marginal notes beside a rule mean that the rule is only enforced at release or pre-release.

A Flush-right italic note immediately following a rule is the rationale behind the rule. A rationale prefixed by 'Technical:' or stating 'Easier to code' are weak – their presence indicates that the rule could be dropped if Hugh had greater coding skill / more time.

12.2 Requirements

12.2.1 System requirements for release validation

1. R and the package `grattanReporter`, installable via my drat repository:

```r
if ("grattanReporter" %in% loadedNamespaces()) {
  stop("Restart R: packages currently loaded will need to be updated.")
}

myLibrary <- .libPaths()[1]
# If the library is on an UNC server \\uom.. it is not writeable:
if (identical(substr(myLibrary, 0, 2), c("\\", "\\"))) {
  myLibrary <- .libPaths()[2]
}
if (!is.na(myLibrary) &&
    #
    # i.e. \\uom...
    identical(substr(myLibrary, 0, 2), c("\\", "\\"))) {
  myLibrary <- tempdir()  # guaranteed to be writeable,
                          # if it's possible to install anything
}
install.packages("TeXCheckR", lib = myLibrary)
install.packages("grattanReporter",
                 lib = myLibrary,
                 repos = "https://hughparsonage.github.io/drat",
                 type = "source")
```

This will ensure you have the latest version of the package that successfully built on the master branch.

Installation instructions:

a) Install R for your operating system from CRAN. Google R for *<your operating system>*

2. An up-to-date LaTeX distribution.[1] In particular, you must have `biber` version 2.6 or greater.

3. Ghostscript (https://ghostscript.com/) and the corresponding system environment set. For example in Windows, following successful installation of Ghostscript:

```
Sys.setenv(R_GSCMD = 'C:/Program Files/gs/gs9.20/bin/gswin64c.exe')
```

4. Internet access (or the latest version of the `grattan`.cls).

12.2.2 Project folder structure required for release

Let `.` be the folder in the top-level directory of your project. Then `.` must contain

1. The folder `./travis/grattanReport/` (which ships with `grattex`).

2. A folder `./RELEASE`. (If it is not present, it will be created, with a warning.)

3. A *unique* `.tex` file, being your report. (Any other `.tex` files should be placed in `./tex`.)

12.3 Style requirements

Preliminary

One `.tex` file   The top-level directory of your project must contain one and only one `.tex` file. This requirement is to ensure the correct file is checked and to enable the command to be run non-interactively.

12.3.1 Preamble

The preamble is all the lines of the `.tex` file before `\begin`{document}. The bulk of these rules will be met if the default template is used.

1. Line 1 must be the `\documentclass`[*<options>*]{`grattan`} line.

   Confirms the report is intended as a Grattan Report. Easier to code.

2. The line `\begin`{document} must occur in the document.

   Determine which lines comprise the preamble

---

[1]See http://tex.stackexchange.com/questions/55437/how-do-i-update-my-tex-distribution for instructions on updating your LaTeX distribution.

3. All your `\addbibresource` invocations must be in the preamble and not in an `\input`.

   Easier to detect bib files used. Support autocompletion.

4. You must have one and only one invocation of `\author{<author names>}` in the preamble, and the first two words in `\author{<author names>}` must be the forename and surname of a member of Grattan staff. `pre_release`

   Avoid misspelling staff names

5. You must have one and only one invocation of `\title{<title of the report>}` in the preamble, and the title must have at least three characters. `pre_release`

   Ensure title is present

6. You may use `\input` within `\acknowledgements{<This report was written by etc.>}` but if you do you must only use `\input{tex/acknowledgements}`.

7. If you invoke `\ReportOrWorkingPaper{Working Paper}`, you must not also have the phrase `This report was written by` in the preamble.

8. If you have the phrase `This working paper was written by` in your preamble, you must invoke `\ReportOrWorkingPaper{Working Paper}` in the preamble.

   Ensure working paper/report distinction is made

9. You must not have the string `embargo` in any line in the preamble if you are attempting a release. `release`

10. The first four characters of `\GrattanReportNumber` must be: `pre_release`

    a) the current year, or

    b) if you used `\YEAR` in the preamble (to specify the year)—the year specified

11. The characters after the first five (year + `-`) must be an integer. `pre_release`

12. The end of the acknowledgements from `This report may be cited as:` to the licence line must be `\footnotesize`. `pre_release`

    Consistency

13. You must have the following line as a single line in the acknowledgements (including the `\par`). `pre_release`

```
All material published or otherwise created by Grattan Institute is
    licensed under a Creative Commons Attribution-NonCommercial-
    ShareAlike 3.0 Unported License\par
```

14. The line after the licence line must be a closing brace.   `pre_release`

15. The line two lines before the licence line must start with the string `ISBN:` and `pre_release` there must be only one such line in the preamble.

16. The ISBN must not be the ISBN provided in the template.   `pre_release`

17. The ISBN must have 13 digits.   `pre_release`

18. The ISBN must have a valid checksum.   `pre_release`

19. The string `This report may be cited as` must be present on the 3rd or 4th line `pre_release` prior to the ISBN line.

20. The line two lines before the ISBN line must be the recommended citation in the `pre_release` correct form, given the authors, title, and year provided.

    All members of Grattan staff in the preamble must be included in the recommended citations. If you have an author that did not contribute to the intellectual substance of the report, but contributed to the preparation of the document, use the directive `% editorial_author_only:` followed by the person's name.

    If you need to add an non-staff member to the recommended citation, use the directive `% add_author_to_recommended_citation:` followed by the person's name.[2] By default, non-staff members are listed last. If you require the author to   From v0.24.0 be placed ahead of staff members, use the directive

    ```
    add_author_to_recommended_citation_at: <author> <order>
    ```

    where `<order>` is an integer specifying the position in the citation for the author.

21. You cannot use the `todonotes` or `soul` packages, or have the command `\hl` any- `pre_release` where in any file in your project.

Ensure editorial comments/markup are gone

---

[2]Note that the authorship policy contemplates this only in exceptional circumstances.

12.3.2 Citations

Postnotes in citations

1. A citation which references a page or section within the opus must reference this in the *postnote* field of the cite command:

```
% Correct:
\textcite[][45--50]{Daleyetal2016}

% Wrong:
\textcite[45--50]{Daleyetal2016}
```

2. A reference to a page must include the page number only; a reference to a page range should use numbers separated by two hyphens. The letter p should not be used.

```
% Correct:
\textcite[][45]{Daleyetal2016}
\textcite[][45--50]{Daleyetal2016}

% Wrong: (uses letter p)
\textcite[][p. 45]{Daleyetal2016}
% Wrong (uses single hyphen)
\textcite[][45-50]{Daleyetal2016}
```

3. When it is necessary to use 'p' for a page reference (for example, because the postnote contains additional text), you must use a consistent format, namely a full stop with a non-breaking space:

```
% Correct:
\textcite[][Table~7 on p.~4]{bentley:1999}

% Wrong
\textcite[][Table~7 on p. 4]{bentley:1999}
\textcite[][Table~7 on p~4]{bentley:1999}
\textcite[][Table~7 on p 4]{bentley:1999}
\textcite[][Table~7 on p.4]{bentley:1999}
```

Consistent formatting of page references

4. Furthermore, use of a singular citation command (*i.e.* the command \textcite or \footcite) when there appears to be more than one citation requested will thrown an error: Use of singular form of textcite or footcite.

12.3.3 Escapes

1. A dollar sign is only allowed if it is preceded by a backslash. Math-mode can only be enabled by \(...\)

```
% Correct:
We spent \$10 million giving \$1 to a million people.

% Wrong: formatted as an equation
We spent $10 million giving $1 to a million people.
% Wrong: correctly formatted but indistinguishable to the parser
If $x, y, z$ are the sides of a right-triangle then $z > y > x$
    implies $z^2 = y^2 + x^2$.
```

Avoiding accidental formatting of sentences as equations

2. An ellipsis must be invoked using \dots{} not three periods (...) or a unicode symbol.

```
% Correct:
But then \dots{} drama!

% Wrong:
But then ... drama!
```

Consistent kerning and spacing

12.3.4 Dashes

1. Dashes must be inserted using two hyphens.

```
% Correct:
This is a dash -- no question.

% Wrong:
This is a dash - actually just a hyphen.
% Wrong:
This is a dash --- but an em-dash, which is a bit much.
```

2. A hyphen adjacent to an en-dash is an error.

Consistency

12.3.5 Spacing

1. The commands \eg, \etc, and \ie must be followed by a punctuation mark or a non-breaking space.

   Prevent incorrectly omitting printable space

2. A space must not occur after the command \label:

   a) Spaces must not occur within \label

   b) A new line is mandatory after \label

   Technical: enables assumptions to be made about hyphens and labels' contents.

12.3.6 Quote marks

1. Closing quotes must not be used to open a quote:

```
% Correct:
So-called `grayfare'.

% Wrong:
These quote marks look 'odd' somehow.
```

Correctness

12.3.7 Footnotes

1. The commands \footnote and \footcite must not occur in the overview.

2. The commands \footnote and \footcite must not occur on the same line in the source.

```
% Not permitted:
A sentence.\footnote{With a footnote} Another sentence.\footnote{
    With another.}

% OK:
A sentence.\footnote{With a footnote}
Another sentence.\footnote{With another.}

% Not permitted:
Sentence 1.\footnote{With a footnote.} Sentence 2.\footcite{key}
% OK
```

```
A sentence.%
  \footnote{With a footnote.}
Another sentence.\footcite{key}
```

Note: putting a paragraph over multiple lines has no visible effect: they will still be printed as paragraphs.

Technical: allows checks to run.

3. Not checked: If your footnote contains multiple paragraphs, please invoke \par rather than a blank line at the paragraph border. My code may not able to run the following checks on footnotes over multiple paragraphs – and may throw arcane error messages.

4. Punctuation must not occur after a footnote mark

```
% Correct
A sentence.\footnote{With a footnote.}

% Wrong:
A sentence\footnote{With a footnote}.
```

Correctness

5. Footnotes must end with a full stop.

```
% Correct
A sentence.\footnote{With a footnote.}

% Wrong:
A sentence\footnote{With a footnote}
```

Consistency

6. Footnote marks must not be preceded by a printable space.

```
% OK
A sentence.\footnote{With a footnote.}
% Also OK (due to %)
A sentence.%
\footnote{With a footnote.}
% Also OK (due to %)
A sentence.%
  \footnote{With a footnote.}
```

```
% Wrong:
A sentence. \footnote{With a footnote.}
% Wrong (not protected by %):
A sentence.
\footnote{With a footnote.}
% Wrong (protection by % is too late):
A sentence. %
\footnote{With a footnote.}
```

Correctness

12.3.8 Labels

Labels are invoked by \label and are used to anchor cross-references.

1. All labels must have a prefix and the prefix must follow the style in Table 4.2 on page 44.

```
% Correct
\section{Clarity and structure}\label{sec:clarity-and-structure}

% Wrong:
\section{Clarity and structure}\label{clarity-and-structure}
```

Clarity for authors. Easier autocompletion.

2. All captions (to figures and tables) must have a \label

```
% Correct
\begin{figure}
\caption{What teachers can do to reduce behaviour problems in the
    classroom\label{fig:what-teachers-can-do}}%
\includegraphics[page=11]{atlas/Charts.pdf}
\end{figure}

% Wrong (no label)
\begin{figure}
\caption{What teachers can do to reduce behaviour problems in the
    classroom}%
\includegraphics[page=11]{atlas/Charts.pdf}
\end{figure}
```

Ease cross-referencing. Requisite of check that all figs/tbls have been referenced.

3. All caption labels must occur on the same line as `\caption`

```
% Wrong (label too late)
\begin{figure}
\caption{What teachers can do to reduce behaviour problems in the
    classroom}%
\includegraphics[page=11]{atlas/Charts.pdf} \label{fig:what-
    teachers-can-do}
\end{figure}
```

Avoid wrong anchoring point. Easier to code.

4. Cross-references to chapters must use `\Chapref` or `\topref`.

```
% Correct
See \Chapref{chap:intro}.

% Wrong:
See \Vref{chap:intro}.
```

Correct hyperlinks.

12.3.9 Cross-references

1. All cross-references must be encoded in a macro (`\Vref` and `\Cref`, and `\Chapref` or `\topref` for chapters, or `\ref` for footnotes).[3]

```
% Correct
See \Chapref{chap:intro} and \Vref{fig:what-teachers-can-do}.

% Wrong:
See Chapter 1 and Figure 3.2.

% Wrong (should be in citation)
This is explained in \textcite{Knuth}, Chapter 2.

% Correct:
This is explained in \textcite[][Chapter 2]{Knuth}.
```

Avoid incorrect or unlinked cross-references.

---

[3]To verify compliance with this rule, the code checks whether there is a cross-reference 'name' (*i.e.* chapter, section, figure *etc*) followed by a number. Postnotes to citations are excluded, *provided the postnote is correctly entered*. There may be other occasions where such a pattern is valid, but the error is still raised. In those instances, use a non-breaking space, *e.g.* 'Section 81 of the Constitution'. Thanks OE for filing.

2. All instances of `\Cref` and `\Vref` must use the upper-case forms.

```
% Correct
See \Cref{fig:look-here}.

% Wrong:
See \cref{fig:look-here}.
```

Consistency

3. All instances of `\Cref`, `\Vref`, and `\Chapref` must not be preceded by the words section, figure, table, or box.

Prevent repeated word in cross-reference

4. Do not place a preposition before `\vpageref`

Prevent repeated word in cross-reference

12.3.10 Sentence-ending periods

1. Sentences which end with a capital letter and are followed by a sentence (*i.e.* are not the last sentence in a paragraph) must be specially marked:

```
% Correct
Many governments have tried to change the GST\@.
But few have succeeded.

% Wrong
Many governments have tried to change the GST.
But few have succeeded.

% Wrong
Many governments have tried to change the GST. But few have
    succeeded.
```

Note: if this error is spurious (*i.e.* the period does not end a sentence), you should use `.\@` (*i.e.* put the `\@` *after* the period). This is rare.

Respect English spacing

12.3.11 Bibliography validation

This should be regularly checked: problems with the entry of the `.bib` file are often time-consuming if left in a broken state.

1. Each field line in each `.bib` file used must end with a comma

```
% Correct
@TechReport{Stiglitz1991invisiblehandmodern,
  author      = {Stiglitz, Joseph E},
  title       = {The invisible hand and modern welfare economics},
  year        = {1991},
  institution = {National Bureau of Economic Research},
}

% Wrong (no comma after institution)
@TechReport{Stiglitz1991invisiblehandmodern,
  author      = {Stiglitz, Joseph E},
  title       = {The invisible hand and modern welfare economics},
  year        = {1991},
  institution = {National Bureau of Economic Research}
}
```

Permit reordering of the file.

2. Institutional authors should be abbreviated when in the author field.   in progress

3. Newspaper articles should use the entry type `@Article{` with the name of the newspaper in the `journal` field.

4. Prefer using the `date` field. If the `date` field is present, the fields `month` and `year` must be absent.

Consistency of output, ibid, idem, *and duplicate avoidance*

5. Duplicate entries in the bibliography are an error.   From v0.14.0

   An entry is a duplicate if its author, year, and title are all identical (ignoring case) to another entry. Note that this will not catch all duplicates (and likely it is not possible to catch all duplicates).

12.3.12 Spelling

You cannot release a document until it has been checked for spelling. You may add words[4] to the dictionary if the spell check throws spurious errors and you may also limit the scope of the spell check during drafting. Furthermore, you may prohibit certain words to mandate consistency in style.

1. Spell check is run using the `hunspell en_GB` dictionary.[5]

2. Use the macros `\eg`, `\ie`, `\etc` rather than the hard-coded forms.

Consistency

3. `stop_if_present:` You may prohibit any set of space-separated patterns using the `% stop_if_present:` directive. For example, the following document will fail:

```
\documentclass{grattan}

% stop_if_present: skillset

\begin{document}
Many teachers rely on many skill sets, but there is one skillset
    that is the best.
\end{document}
```

4. `add_to_dictionary:` You may use the `% add_to_dictionary:` directive to add space-separated words to the set of words to skip in the spell check.

`% stop_if_present:` takes precedence over `% add_to_dictionary:`. The following document still fails.

```
\documentclass{grattan}

% stop_if_present: skillset
% add_to_dictionary: skillset

\begin{document}
Many teachers rely on many skill sets, but there is one skillset
    that is the best.
\end{document}
```

In addition, `% stop_if_present:` in the document preamble has global scope; if you use `\input` to import sections of text, `% stop_if_present:` applies to those

---

[4] Although the distinction will be irrelevant for most additions, by *words* I mean PCRE regular expressions.
[5] An Australian-English dictionary is available in R but not yet on Travis where the package is tested.

sections too. By contrast, the scope of `% add_to_dictionary:` is only the current `.tex` file. This is by design: to enable the case where a word should only be permitted in a particular section of text, and to avoid inadvertent additions to the dictionary.

5. **ignore_spelling_in:** You may use the `% ignore_spelling_in:` directive to ignore spelling within the first argument of the given commands. For example, the following document will pass (the spell check):

```
\documentclass{grattan}

\newcommand*{\hl}[1]{\textcolor{red}{#1}}
% ignore_spelling_in: hl
% add_to_dictionary: skillset

\begin{document}
Many teachers rely on many skill sets, but there is one skillset
    that is the best.

\hl{i can taip whatever i wan here!!}
\end{document}
```

This is provided for convenience during drafting – to allow comments that are printable but still fenced-off from the main document. In that spirit, the directive is not permitted when `pre_release = TRUE` (*i.e.* you must clean up your comments before seeking a pre-release version).

Some commands' and environments' arguments are excluded regardless, *viz.* `\label` (including the third argument of boxes) `\*cite` `\*ref` `tabularx` `tabular` `table` `captionsetup` `\phantom` `\gls`.

6. If you introduce a new acronym or initialism using capital letters within parentheses following its full form (*i.e.* the usual way), the abbreviation will be automatically added to the dictionary. For example, the following will pass:

```
The Quebec Xylophone Enterprise Foundation (QXEF) is fictional.
```

the words *and*, *of*, *the*, *to*, and *in*, are excluded when backtracking from the abbreviation. The following will still pass:

```
The Quebec Xylophone Enterprise Foundation of Canada (QXEFC) is
    fictional.
```

further, if those stop words form part of the abbreviation, that combination will also be considered and added to the dictionary:

From v0.8.3

```
% Still succeeds:
The Quebec Xylophone Enterprise Foundation of Canada (QXEFoC) is
    fictional.
```

7. If a spelling error is suspected during parsing and the suspect word begins with a capital letter, but can't be matched with any provided words, the bibliography is consulted. If the word is an author in the bibliography, the word is skipped with a NOTE reminding you to use `\citeauthor` or use `% add_to_dictionary:` . Author names will *not* be skipped at pre-release – they must be included with `\citeauthor` or asserted as correct via `% add_to_dictionary:` .

8. A lower-case letter followed by a full stop followed by a capital letter is treated as an erroneously entered sentence break. This was a common error, and has not been observed to throw a spurious error yet.

9. Contractions should not result in an error, but only when it is typed with an ASCII apostrophe, not Unicode symbol U+2019 and friends (also known as 'smart quotes'). In the tex file, the correct, ASCII apostrophe will look plain and vertical, whereas the others will look angled, curved, or serifed.

If `grattanReporter` throws a spurious spelling error on a word that is likely to occur in other reports, please file this is as an issue at

https://github.com/hughparsonage/grattanReporter/issues

12.3.13 All tables and figures should be referenced

1. For every figure and table in the document, you must have a cross-reference anchored thereto.

Avoid confusing reader. Ensure no errant figures.

During drafting, an unreferenced figure is a NOTE.

If a figure or table does not need to be referenced, you may exclude it from the check using the `% may_be_left_unreferenced:` directive.

From v0.19.0

```
% OK:
\documentclass{article}

% may_be_left_unreferenced: fig:magritte

\begin{document}
There are no figures in this document.

\begin{figure}
\caption{ceci n'est pas une figure}\label{fig:magritte}
\end{figure}
\end{document}
```

12.4 Compile requirements

12.4.1 LaTeX must compile

Your document must compile on an arbitrary machine with an up-to-date TeX distribution.

12.4.2 No missing citations or badly-entered bibliographies

Your project must be capable of running

```
biber -V Report
```

with no errors and limited warnings. In practice this means you must correctly enter the reference keys in your document. In particular,

1. You must use Biber version 2.6 or greater

2. You must use a valid date YYYY-MM-DD for each `date = {}` entry. Alternatively, you must include a year and this year must be an integer for every `year = {}` field, unless:

   a) you are citing a piece of legislation, in which case you must insert the legislation's jurisdiction in the `year = {}` field (and put the year in the title):

   ```
   @Misc{GST-Act-1999,
     title = {A New Tax System (Goods and Services Tax) Act 1999},
     year = {Cth},
   }
   ```

   The key of such entries must contain one of the strings `Act`, `Reg`, or `Bill`. The jurisdiction must be one

Cth	NSW	Vic	SA	Tas	Qld	WA	ACT	NT	NZ

   LaTeX has support for the AGLC but not in combination with other styles, so this kludge may be avoided in future versions.

   b) You use the literal `{n.d.}` when the entry's date of publication is unknown.[6]

   For forthcoming works put the (expected) date of publication and use the `pubstate = {forthcoming}` field to the entry.

3. Warnings concerning `junk found` are usually brought on by text outside entries. This is an error as it may indicate an entry has been splinched or prematurely closed. In the following, the junk characters are from `year` onwards, as the previous line's

---

[6]This is expected to not throw a warning with a change in Biber 2.8. You should nonetheless endeavour to find out the publication date. For online material, you can do this by interrogating the PDF metadata or by visiting `https://www.google.com.au/search?q=inurl:<URL>&as_qdr=y20`.

closing brace ends the entry (even though subsequent lines were intended to be included).

```
@TechReport{Stiglitz1991invisiblehandmodern,
author      = {Stiglitz, Joseph E},
title       = {The invisible hand and modern welfare economics},
}
year        = {1991},
institution = {National Bureau of Economic Research},
```

4. If biber emits any other warnings, you must address them, even if doing so appears to have no visible effect.

Ensure true warnings are not masked. Improve citation portability and longevity.

Common errors include:

a) Specifying a publisher for a @TechReport or @Article

b) Failing to specify the institution field for a @TechReport.

c) Specifying ISBNs, ISSNs, etc when these are not appropriate.

12.4.3 No missing cross-references

The log file written by LaTeX must not emit a warning about Undefined references or multiply-defined labels. These occur when a cross-reference or citation has been made using the wrong (likely misspelled or relabelled) key:

```
% Wrong:
I'd like to refer to the next section, \Cref{sec:next-section}.

\section{This section}\label{sec:this-section}
```

12.4.4 Infinite loops

checkGrattanReport(compile = TRUE) will recompile the document as often as is required to stabilize cross-references. In some cases, it is not possible with the text provided to do so. For example, consider a cross reference using \Vref to the document's second figure on page 8. If \Vref ends up in a sentence on the file line of page 9, LaTeX has two options:

1. Use the phrase "Figure 2 on the previous page" over page 9 and page 10; or

2. Use the phrase "Figure 2 on page 8" on page 9.

neither of which are appropriate.

In such an instance, you will receive an error message:

Unstable Vref. (LaTeX Warning: Label(s) may have changed. Rerun to get cross-references right.)

above which there should be advice about which page boundaries have a straddling `\Vref`. You should change these to `\Cref` if appropriate or reword the paragraph if `\Vref` is necessary.

12.4.5 Ensuring `smallboxes` of a certain size do not intrude on the chapter title

If a box has around 22 lines of text, has a title/caption that extends over more than one line, occurs on the first page of a sufficiently large chapter, you must use a `verysmallbox` (perhaps with the optional parameter `[p]`) if the vertical position of the caption exceeds 166,160,000 nanometres from the bottom of the page (*i.e.* if the caption is set higher than the bottom of the space allocated for the chapter title).

12.4.6 Checking placement of `\CenturyFootnote`

Our footnote style provides ample space between the number and the text in the footnote for the first 99 footnotes. At the 100th footnote, there is not enough space, so the format must be redefined. The reformat cannot necessarily take place simply between the 99th footnote and 100th footnote, because this would create an unsightly kink in the text in the footnote area if the two footnotes occur in the same column. Instead, the rule is that the command must be placed after the last footnote in the column immediately preceding the column in which the 100th footnote is placed. Note that this is something that must occur after full compilation as expansion of citations and cross-references may alter the columns in which the footnotes fall.

The command `\CenturyFootnote` correctly reformats the footnote, but cannot know whether it's in the right place. LATEX can provide this information, but moving the command would be too rude.

The function **`check_CenturyFootnote()`** runs within `checkGrattanReport(...)`, echoing a check mark if it is correctly placed (or if it is absent but not needed), or an NOTE if it thinks the command has not been correctly placed, and a suggested location for it.

A NOTE may appear even when `\CenturyFootnote` has been correctly placed if the column preceding the 100th footnote is empty or contains a figure, table, or box. If the column containing the 100th footnote looks good (*i.e.* the number and footnote text aren't too cramped, and there are no kinks in the footnote text) and the previous column containing numbered footnotes also looks good (*i.e.* spacing normal, and no kinks in the footnote text), then the NOTE does not need to be addressed.

Don't trust Hugh: This was a bit of a beast to code so please visually check the 100th footnote columns before release and report any errors.

12.5 Release notes

12.5.1 Front page

To include the front page proper, use `\documentclass[FrontPage]{grattan}`.

To ensure the front page is of a sufficient resolution yet reasonable size, users of Windows and Linux can use Ghostscript. (See Section 12.2.1 on page 60 for installation instructions.)

With `grattanReporter`, you can run (from the project's working directory): From v0.25.0

```
compress_FrontPage()
```

13 Travis Continuous Integration

Continuous integration is provided to provide timely notifications of input errors, such as typos.

Travis Continuous Integration is a SaaS testing service.

13.1 Synopsis

13.1.1 For authors

To trigger a build test on Travis, you push to GitHub. To push to GitHub in ShareLaTeX, click the hamburger menu button at top left, then `GitHub > Push changes to GitHub > Commit`.

13.1.2 Implementation
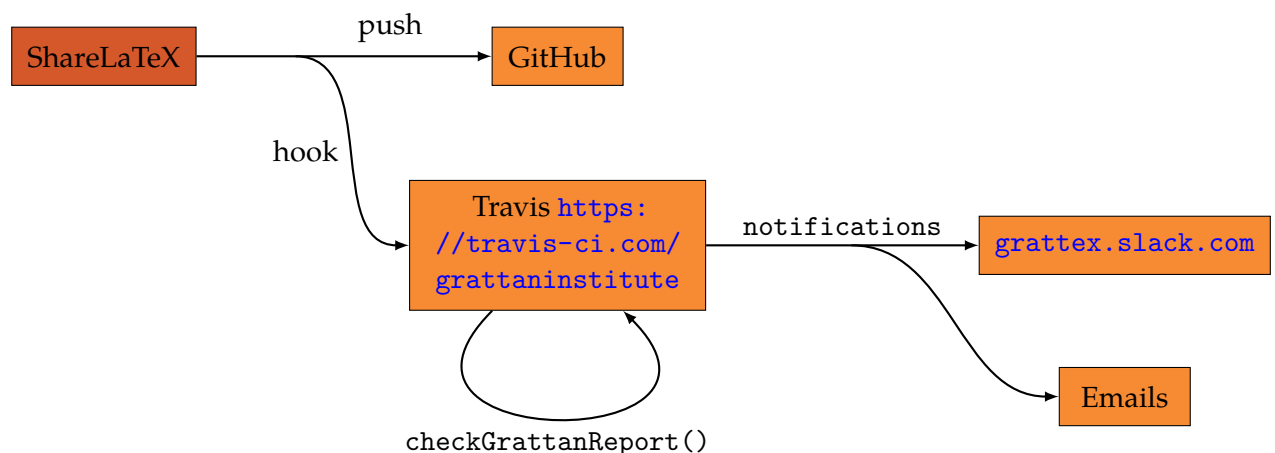
13.2 Annunciation

By default, any problems with your report will be annunciated only on the `general` channel at https://grattex.slack.com. I recommend setting a more drastic and sonorous annunciation, such as notification for your slack channel, or emails on `change`.

To change the channel on which Travis notifications will be broadcast, you need to edit the following part of the `.travis.yml` file.

```
notifications:
  slack: grattex:7yiVyM6NvMmCE49ccxaUX2QG
  on_success: change
```

For example, to change to the aust-perspectives channel

```
notifications:
  slack: grattex:7yiVyM6NvMmCE49ccxaUX2QG#aust-perspectives
  on_success: change
```

Add email addresses, set up to receive build notifications whenever a build fails, and whenever a previously failed build is fixed.

```
notifications:
  slack: grattex:7yiVyM6NvMmCE49ccxaUX2QG#aust-perspectives
  on_success: change
  email:
    recipients:
      - john.daley@grattan.edu.au
      - danielle.wood@grattan.edu.au
    on_success: change
    on_failure: always
```

For more information, see https://docs.travis-ci.com/user/notifications.

13.2.1 Travis-CI build failures should be assigned high precedence

You should treat Travis build failures with greater urgency than *any other work* for the following reasons:

1. **It's a small task** Travis build failures are designed to be easy to fix: they are discrete, unambiguous, and are issued with a clear error message and clear advice.[1] And when they're not both, you only have to report this to HughParsonage and your duty is done – *i.e.* even when they're not quick and easy to fix, they're still quick and easy. Thinking about whether you have time to fix it will take about the same time as fixing it.

   In addition, errors are infrequent – you won't be frequently fixing errors.

2. **It's the only way to prevent typos being published.** Although reports are proofread,[2] it is a task that has never been done perfectly; put less euphemistically,

---

[1] If you encounter unclear error messages or advice, or if, despite frequent checking and not unusual clumsiness, errors seem to be time-consuming to resolve, please let me know.

[2] … and still need to be: `grattanReporter` can't check (all) grammar and content.

all reports have had typos. In addition, a substantial amount of typing is done downstream of editing and proof-reading.

3. **Hugh will fix them anyway.** Consecutively broken builds will be assigned to Hugh if there is no evidence the team is endeavouring to fix them.

4. **It is easier if done frequently.** It is easier to understand an error you have just made than one made weeks ago. And as you see the errors you made, you will become trained to not make them again.

5. **It is courteous to your collaborators.** Failing to fix a mistake you've made means your collaborators have to. And just as it's harder to fix an error you made weeks ago than one you made today, it's harder to fix someone else's error than one's own. (*Is that the real author's name, or has John just made a typo?*)

6. **It will improve the predictability of release time.** It is far easier to predict the release of a report which `checkGrattanReport(release = TRUE)` returns a pass. By contrast, it is not possible to know in general how long it will take to debug a report that has been left for weeks in a broken state.

7. **It's good practice in software development — and a rule even more applicable to report writing.** "Fix bugs before applying new features" is a proven maxim. But in software development it is hard to fix bugs and hard to predict the time it will take to do so. In contrast, provided you are frequently checking, it will take at most a minute to fix a broken grattanReporter build.

Note that this advice does not entail continuously checking for Travis errors. On the contrary, while you should avoid making errors while drafting, you should not wait for Travis to check your report before continuing. You should simply synchronize with GitHub frequently – every time you get up from your desk – and act immediately when you are notified of errors.

Table 13.1: List of all institutional abbreviations

AAP	Australian Associated Press
ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ABC	ABC entities
ABS	Australian Bureau of Statistics
ACARA	Australian Curriculum, Assessment and Reporting Authority
ACCC	Australian Competition and Consumer Commission
ACDS	Australian Council of Deans of Science
ACER	Australian Council for Educational Research
ACNC	Australian Charities and Not-for-profits Commission
ACODS	Australian Council of Dental Schools
ACOLA	Australian Council of Learned Academies
ACOSS	Australian Council of Social Service
ACPET	Australian Council for Private Education and Training
AEC	Australian Electoral Commission
AEI	Australian Education International
AIFS	Australian Institute of Family Studies
AIG	Australian Industry Group
AIHW	Australian Institute of Health and Welfare
AIIA	Australian Information Industry Association
AIST	The Australian Institute of Superannuation Trustees
AITSL	Australian Institute for Teaching and School Leadership
ALP	Australian Labor Party
AMA	Australian Medical Association
AMWAC	Australian Medical Workforce Advisory Committee
ANAO	Australian National Audit Office
ANU	Australian National University
ANZ	ANZ
APEC	Asia-Pacific Economic Cooperation
APRA	Australian Prudential Regulation Authority
AQF	Australian Qualifications Framework
ARC	Australian Research Council
ASFA	Association of Superannuation Funds of Australia
ASIC	Australian Securities and Investments Commission
ASX	Australian Stock Exchange
ATN	Australian Technology Network of Universities
ATO	Australian Taxation Office
ATSE	Australian Academy of Technological Sciences and Engineering
AVCC	Australian Vice-Chancellors' Committee
AWPA	Australian Workforce and Productivity Agency
BCA	Business Council of Australia
BCG	The Boston Consulting Group
BIHECC	Business, Industry and Higher Education Collaboration Council
BITRE	Bureau of Infrastructure, Transport and Regional Economics
BREE	Bureau of Resources and Energy Economics
BTRE	Bureau of Transport and Regional Economics, Department of Transport and Regional Services
CBO	Congressional Budget Office
CIRES	Centre for International Research on Education Systems
COAG	Council of Australian Governments
CSIRO	Commonwealth Science and Industrial Research Organisation
DEECD	Department of Education and Early Childhood Development
DEET	Department of Employment, Education and Training
DEEWR	Department of Education, Employment and Workplace Relations
DEST	Department of Education, Science and Training
DET	Department of Education and Training

author	Institution
DETYA	Department of Education, Training and Youth Affairs
DFAT	Department of Foreign Affairs and Trade
DHS	Department of Human Services
DIAC	Australian Department of Immigration and Citizenship
DIBP	Department of Immigration and Border Protection
DIBP	Department of Immigration and Border Protection
DIICCSRTE	Department of Industry, Innovation, Science, Research and Tertiary Education
DIIS	Office of Chief Economist / Department of Industry, Innovation and Science
DIISR	Australian Department of Innovation, Industry, Science and Research
DIISRTE	Department of Industry, Innovation, Science, Research and Tertiary Education
DIS	Department of Industry and Science
DMO	Defence Materiel Organisation
DOHA	Department of Health and Ageing
DPMC	Department of Prime Minister and Cabinet
DRET	Department of Resources, Energy and Tourism
DSS	Department of Social Services
DTF NT	Department of Treasury & Finance, NT
DTF SA	*etc*
DTF Tasmania	
DTF Victoria	
DIRE NSW	NSW Department of Trade and Investment Resources and Energy
EC	European Commission
ESA	Economic Society of Australia
EY	Ernst & Young
FIRB	Foreign Investment Review Board
FWC	Fair Work Commission
GCA	Graduate Careers Australia
GMAC	Graduate Management Admission Council
HILDA	Melbourne Institute of Applied Economic and Social Research, University of Melbourne
HMRC	HM Revenue & Customs
HM Treasury	
HSBC	HSBC
HWA	Health Workforce Australia
ICAC	Independent Commission Against Corruption
IHPA	Independent Hospital Pricing Authority
IMF	International Monetary Fund
IRS	Internal Revenue Service
IRU	Innovative Research Universities
ITS Global	
KPMG	KPMG
KPMG Econtech	Universities Australia
MCEETYA	Ministerial Council on Education, Employment and Youth Affairs
NAB	National Australia Bank
NACUBO	National Association of College and University Business Officers
UK	National Audit Office (UK)
NAP	National Assessment Program
NATSEM	National Centre for Social and Economic Modelling
NBN Co	
NCSEHE	National Centre for Student Equity in Higher Education, Curtin University
NCVER	National Centre for Vocational Education Research
NHMRC	National Health and Medical Research Council
UK NICE	UK National Institute for Health and Care Excellence
NMC	New Media Consortium
NSSE	Indiana University Center for Postsecondary Research
NSW DEC	Department of Education and Communities

author	Institution
NSW RMS	NSW Roads and Maritime Services
NTEU	National Tertiary Education Union
OCS	Office of the Chief Scientist
OECD	Organization of Economic Cooperation and Development
OUA	Open Universities Australia
PBO	Parliamentary Budget Office
PBS	
PC	Productivity Commission
PGA	Parkville Global Advisory
PHARMAC	NZ Pharmaceutical Management Agency
PHIAC	Private Health Insurance Administration Council
PMC	Department of Prime Minister and Cabinet
PWC	Price Waterhouse Coopers
LJ Perry	
QUT	Queensland University of Technology
RBA	Reserve Bank of Australia
RDL WA	
RUN	Regional Universities Network
SA DPTI	South Australian Department of Planning, Transport and Infrastructure
SA DTF	South Australian Department of Treasury and Finance
SA Government	South Australian Government
SEEK	SEEK Limited
SHRM	Society for Human Resource Management
TEQSA	Tertiary Education Quality and Standards Agency
UCAS	Universities and Colleges Admissions Service
UK JCPSG	Joint Costing and Pricing Steering Group
UNSW	University of NSW
USyd	University of Sydney
UWA	University of Western Australia
UWS	University of Western Sydney
VCEC	Victorian Competition & Efficiency Commission
VRQA	Victorian Registration and Qualifications Authority
WHO	World Health Organisation

Part V

Error messages

A Common LaTeX Errors

This chapter is best understood by following the PDF output.

The following is a list of common LaTeX compile errors as they appear in the log file, and suggestions for how to resolve these. More often than not, errors come from something simple, such as forgetting a parenthesis, a typo, or forgetting to end an environment. But there are also cases where you have no idea what you have done wrong and it can take a fair bit of time to find or even understand your error.

A feature of ShareLaTeX is that it provides 'hints' on how to resolve particular errors – most of the time these hints are sufficient. But if not, it may be necessary to view the raw log file to diagnose the problem.

B The Form of an Error

There are two forms of errors: LaTeX errors and TeX errors. In both types of errors, the part after the error message will tell you where the error occurred. An example:

```
l.15 <offending text>
```

The `l.15` tells you what line the error occurred on and the text will tell you the text that caused the error.

B.1 LaTeX Errors

The general form of an error in LaTeX is shown below:

```
! LaTeX error: <error message>

See the LaTeX manual or LaTeX Companion for
explanation.
Type H <return>   for immediate help.
...
```

The `!` lets you know that the error has occurred. The error message will tell you what type of error you have committed. After the ellipses, you will find the line at which the error occurred and the text that caused the error (or at least the text where LaTeX found the error).

B.2 TeX Errors

Errors may also have the following form:

```
! <error message>
```

These errors are formatted differently because they are error messages that came from TeX instead of LaTeX. After the error, you will still find the line that the error occurred in and the text of the error.

C Warnings

There are some error messages that are just warnings and will not stop or change the compilation of the document. Chances are you have seen them many times.

C.1 Underfull

The following error results when a line does not extend the width of the page, something LaTeX always tries to accomplish:

```
Underfull \hbox (badness 10000) in paragraph at lines
104--107
```

This error message is just a warning and is not something to worry about. For the most part, when a line does not span the width of the page, it is because you have written something that you want to only cover part of the page.

C.2 Overfull

The following error results when a line extends beyond the width of the page:

```
Overfull \hbox (16.04988pt too wide) in paragraph at
lines 30--31 [] [] \OT1/cmtt/m/n/12 I'm trying to put
way too much text into a line in my document.
```

Usually this error comes form when you are using the verbatim package because it will not move to the next line if your text does not go to the next line. The easiest way to fix this is to find the place in your document where this is occurring and change the text so that it fits to the page.

This error will still show up if the text is still on the page but outside of the width of text that LaTeX has set. In this case, you are welcome to fix things so that the error does not show up or you can leave the text as it is.

C.3 References

The following warnings occur when references are changed when LaTeX was compiled:

```
LaTeX Warning: Label(s) may have changed. Rerun to get
cross-references right.

LaTeX Warning: There were undefined references.

LaTeX Warning: Reference `name' on page 1 undefined on
input line 15.
```

The way to fix these errors is to recompile the document again to correct the page numbers. Sometimes it is necessary to recompile the document twice to fix this error. You also may have defined a reference wrong, so you should check to make sure your label is correct.

D Beginning and Ending

D.1 Begin Ended by End

This type of error occurs when each environment is not correctly started and ended. When you are missing an \end command, the following error will show up:

```
! LaTeX Error: \begin{enumerate} on input line 23
ended by \end{document}.
```

To fix this, you need to end the environment mentioned in the error with the appropriate command.

When you are missing a \begin command, the following will appear:

```
! LaTeX Error: \begin{document} ended by
\end{itemize}.
```

To fix this, you basically do the same thing as before, correctly beginning the environment mentioned in the error with the appropriate command.

D.2 End Occurred Inside a Group

The following error message will show up at the end of compiling a file if an environment is begun that is not ended:

```
(\end occurred inside a group at level <n>)
```

To fix this error, make sure you end the environment that was begun. The previous error is more helpful in finding the \begin statement.

D.3 Ended by End of Line

The following error will occur when you try to place a command inside a section heading:

```
! LaTeX Error: \verb ended by end of line.

See the LaTeX manual or LaTeX Companion for
explanation.
Type H <return>   for immediate help.
...
```

There will be many errors of the same type for this mistake. In order to find where you put the command, look in the output file and find the last heading that shows up.

D.4 Missing Begin Document

This error is self-explanatory:

```
! LaTeX Error: Missing \begin{document}
```

E Errors Usually Caused by Bad Spelling

E.1 Unknown Control Sequence

This error results when you use a command (something that starts with a \) that is not recognized by LaTeX:

```
! Undefined control sequence.
```

Usually this error results from spelling a command incorrectly. Go to the line that is indicated by the error and fix the command.

E.2 Environment Undefined

This error results when you begin an environment with a \begin command that is not recognized:

```
! LaTeX Error: Environment verbatin undefined.
```

Usually you have just spelled your environment incorrectly, so you just need to fix it.

E.3 Bad File Name

This error results when you have mistyped the command latex or do not have LaTeX installed on your computer:

```
Bad command or file name
```

To fix this, correctly spell the command to compile your file or make sure that LaTeX is correctly installed on your computer.

E.4 Cannot Find File Name

This error occurs when you try to compile a file that the computer cannot find:

```
! I can't find file `sample'.
<*> sample

Please type another input file name:
```

To fix this error, make sure you have spelled the file name correctly. You also may be in the wrong directory to compile the file, so check to make sure you are in the same directory as your file.

F Fatal Errors

F.1 Runaway Argument

This error happens when a paragraph ends before a command's argument is done (i.e., LaTeX thinks that there is a missing }):

```
Runaway argument?
```

To fix this, you should use a different command to accomplish what you are trying to do. An example of this is to use `\bfseries` instead of `\bftext` to make bold text in more than one paragraph.

This error can also be caused by a missing mandatory argument to a command.

F.2 Just an *

This error normally occurs when you do not end your document with `\end{document}`:

```
*
```

If you are prompted to enter something in, it is best to enter

```
\end{document}
```

and hope it works. Be sure to end your document with the appropriate command.

F.3 Emergency Stop

This error happens when LaTeX will stop trying to compile your document due to a serious error:

```
! Emergency stop.
```

To fix this error, you will need to figure out what caused it to stop compiling. Chance are you forgot to end your document with `\end{document}`, but there might also be another reason for the emergency stop.

F.4 Please Type a Command or Say End

This error happens when your file has ended prematurely:

```
(Please type a command or say `\end')
```

The best way to deal with this type of error is to type

```
\end
```

or

```
\end{document}
```

in the case that the absence of that command caused the error. Usually if you have ended your document correctly, the error will result from a missing } or forgetting to end a verbatim environment.

F.5 Floats lost

This can either mean:

1. You have forgotten to use \end{figure} (or table *etc*) for a particular float; or

2. You have put a float inside another float. For example, you have put a todonote inside a figure, or you have put a figure inside a footnote, or you have put a figure (without using the [H]) inside a box.

This is a difficult problem to debug. The line of output given by the error message is the first place where LaTeX noticed something went wrong. (So the offending code is before that – though unfortunately not always immediately before that.)

G Graphics Errors

G.1 Too Many Unprocessed Floats

This error occurs when figures or tables (i.e., floats) have not been typeset:

```
! LaTeX Error: Too many unprocessed floats.
```

LaTeX can only have so many floats waiting to be typeset. In order to fix this error, make sure that you are placing your floats where you want them (with a [h] option) and not wanting too many on one page in sequence. Using the command \clearpage can be very useful in distributing floats correctly.

G.2 Unknown Graphics Extension

The following error occurs when you try to use a type of graphic that is not supported by the type of file that you are producing:

```
! LaTeX Error: Unknown graphics extension: .gif
```

In order to fix this error, you should change your graphics to the types that are supported by the type of file you are outputting or you will need to include the correct package to deal with that type of graphic. Sometimes you may have named the graphic poorly so that LaTeX will not recognize it as a graphic file.

G.3 Division by Zero

The following error occurs when the height of a graphic object is zero:

```
! Package graphics Error: Division by 0.
```

This is usually caused when you rotate an object with zero depth so that its height becomes zero. The best way to fix this is to use the keyword totalheight instead of height.

H Math Errors

H.1 Display Math Should End With $$

This error occurs when the displaymath or equation mode is ended incorrectly:

```
! Display math should end with $$
```

To fix this error, make sure that you end the displaymath or equation mode correctly (ending them with a $ is not acceptable).

H.2 Bad Math Environment Delimiter

This error occurs when you do not have your delimiters correct in math mode:

```
! LaTeX Error: Bad math environment delimiter.
```

Usually this occurs when you forget to match a right delimiter with every left delimiter. This error may also happen when you forget to end an array.

H.3 Missing Right

This error occurs when you have a missing right parenthesis:

```
! Extra \right.
```

To fix this, you either need to add a `\right` command or you need to end an array.

H.4 Missing Delimiter

This error message occurs when a delimiter is missing:

```
! Missing delimiter (. inserted).
```

To fix this error, you need to make sure that you have a right delimiter for every left delimiter. If you do not want a right delimiter matching a left delimiter, you need to use "." to not have an error message show up.

H.5 Missing $ Inserted

The following error occurs when you try to use a character that can only be used in math mode, like _ or ˆ:

```
! Missing $ inserted
```

To fix this error, make sure you change the character to what it should be in text mode.

I Tabular Environment Errors

I.1 Misplaced Alignment Tab Character &

This error occurs when you use & and when you are not in a tabular environment:

```
Misplaced alignment tab character &
```

To fix this error, you need to use \& to make a &.

I.2 Extra Alignment Tab

This error occurs when you use too many tabs for the number of columns in a table:

```
! Extra alignment tab has been changed to \cr
```

The result of this error is that a new row is formed where the extra tab was. You should go back and fix your table so that the correct number of items in each row would show up.

J Errors With Lists

J.1 Missing Item

This error occurs when there is plain text in an environment that takes items:

```
! LaTeX Error: Something's wrong--perhaps a missing
\item.
```

To fix this error, make sure the plain text is changed into an item.

J.2 Too Deeply Nested

This error occurs when there are too many lists for LaTeX to handle:

```
! LaTeX Error: Too deeply nested
```

LaTeX can only handle four levels of one type of list and six levels of different types of lists. To fix this, you need to use less levels of lists or define your own list environment.

K Miscellaneous Errors

K.1 Only Used in the Preamble

This error occurs when you place a command in the body of a LaTeX document that should be placed in the preamble:

```
! LaTeX Error: Can be used only in the preamble.
```

To fix this error, just move the command to the preamble.

K.2 There Is No Line/Page Here to End

This error occurs when you incorrectly use the commands that make a new line or a new page:

```
! LaTeX Error: There's a no line here to end.
```

You may just leave the command that is making a new line in place or you can take it out. Here, LaTeX is just trying to make sure that everything looks nice.

K.3 Command Already Defined

This error occurs when you try to define a command that already exists:

```
! LaTeX Error: Command ... already defined.
```

To fix this, you need to define your command differently.

K.4 Missing Number

This error is made when a number is expected as an argument and one is not provided:

```
! Missing number, treated as zero.
```

To fix this error, you need to find where a number is expected so that you can provide the correct one.

Part VI

Implementation and maintenance

Changing affiliates

The best way in practice to change the affiliations page is to search for some of the current affiliates and insert the new affiliate at the location. The main thing is to ensure the affiliate columns are balanced.

grattan.cls

```
\NeedsTeXFormat{LaTeX2e}
\ProvidesClass{grattan}[2018-02-26 v1.3.3 Reports of the Grattan
    Institute, Melbourne]
% >gswin64 -dBATCH -dNOPAUSE -sDEVICE=png16m -r300 -sOutputFile=./tests/
    Report%03d.png Report.pdf
% for png files
\LoadClass[%
a4paper,
11pt,
titlepage,
headings=big,
chapterprefix=false,
headsepline,
twocolumn,
numbers=noenddot,
]{scrreprt}


% Continuous numbering
\@ifundefined{counterwithout}{
\RequirePackage{chngcntr}
}{}
\RequirePackage{etoolbox}
\RequirePackage{footmisc}
\RequirePackage{tablefootnote} % for footnotes within tables
\RequirePackage{zref-savepos}

% Record number and page of footnote:
% http://tex.stackexchange.com/questions/348891/determine-which-page-all-
    footnotes-landed-on#348940
% This must be before hyperref and after
% etoolbox footmisc tablefootnote
\patchcmd{\@footnotetext}
  {#1}
  {\zsavepos{footnote@@@\thefootnote}\label{footnote@@@\thefootnote}#1}
  {}
  {\ddt}
```

```latex
% avoid non-discretionary hyphens
\exhyphenpenalty=900
\hyphenpenalty=800
\brokenpenalty=3000

\RequirePackage{cmap}
\RequirePackage{scrhack}
\RequirePackage{xcolor}
\RequirePackage{amsmath}
\RequirePackage{amssymb}
\RequirePackage{tikz}
\RequirePackage{adjustbox}
  \usetikzlibrary{positioning}
  \usetikzlibrary{decorations.text}
  \usetikzlibrary{decorations.pathmorphing}
  \usetikzlibrary{patterns,arrows,decorations.pathreplacing} % for
      waterfalls
\RequirePackage{float}
\RequirePackage{placeins}
\RequirePackage{afterpage}
\nonfrenchspacing
\iffalse
\RequirePackage[activate=false, expansion, final, kerning=true, spacing=
    true]{microtype}
\microtypecontext{spacing=nonfrench}
% http://tex.stackexchange.com/questions/303457/setprotrusion-with-
    helvetica-on-specific-characters
\SetProtrusion
   [ name    = T1-phv,      % the name is optional
     load    = T1-default ] % first load `T1-default` settings
   { encoding = T1,
     family  = phv }        % use for Helvetica family
   {
     \textendash = {-25, }, \textemdash = {-25, } % cancel out left
        protrusion
   }
\fi
\RequirePackage[document]{ragged2e}
% ------
% Grattan colors
\definecolor{Orange}{RGB}{243,144,29}
\definecolor{DarkOrange}{RGB}{212,88,42}
```

```latex
\definecolor{OrangeBackground}{RGB}{254,240,222} % for boxes
\definecolor{Color1}{RGB}{255,224,127}
\definecolor{Color2}{RGB}{255,195,90}
\definecolor{Color3}{RGB}{246,139,51}
\definecolor{Color4}{RGB}{212,88,42}
\definecolor{Color5}{RGB}{160,34,38}
\definecolor{Color6}{RGB}{98,18,20}
\definecolor{theGrey}{RGB}{106,115,123}
\definecolor{AuthorPage}{RGB}{160,34,38}
\definecolor{AuthorGrey}{RGB}{174,174,174}


% Bullets and numbered items
\RequirePackage{enumitem}
% Eliminate left margin
% \setlist[itemize]{leftmargin=*}
% \setlist[enumerate]{leftmargin=*}

% See http://tex.stackexchange.com/questions/8510/reduce-size-of-bullet-
   character-in-lists
% Purpose to enlarge and subsequently raise the bullet
% see also \renewcommand{\labelitemi}{\raise .5ex\hbox{\tiny$\bullet$}}
\renewcommand{\labelitemi}{\color{Orange}\parbox[c]{.5em}{\small
   \ensuremath{\bullet}}{\normalsize\strut}}
\renewcommand{\labelenumi}{\color{Orange}{\bfseries \arabic{enumi}.~}}
\renewcommand{\labelitemii}{{\color{Orange}\bfseries \textendash}}
% ------
\RequirePackage{colortbl}
\RequirePackage{array}
\newcommand{\myhline}{\noalign{\global\arrayrulewidth1pt}\hline
                \noalign{\global\arrayrulewidth1pt}}


\RequirePackage{graphicx}
\RequirePackage{booktabs}
% No widows
\RequirePackage[all]{nowidow}

\RequirePackage[utf8]{inputenc}
\RequirePackage[T1]{fontenc}


\RequirePackage[scaled]{helvet}
```

```latex
  \renewcommand{\familydefault}{\sfdefault}

\RequirePackage[framemethod=TikZ]{mdframed}
\RequirePackage{newfloat}
\RequirePackage{caption}
% Cross references.
\RequirePackage{varioref}
\PassOptionsToPackage{hyphens}{url}
\RequirePackage[
  hypertexnames=false,
  hidelinks
]{hyperref}
\RequirePackage{cleveref}

% For previous page for 'varioref'
% space after second -2 is important here.
\patchcmd\cref@old@@vpageref
{\advance\@tempcnta-2}
{\advance\@tempcnta-2 }{\typeout{patch ok}}{\ERRORpatchFaild}

% Hack for Chapter references
% This ensures that chapter hyperlinks hit the page
% not the baseline below the chapter title.
\newcommand{\topref}[1]% #1 = label
{\hyperlink{page.\getpagerefnumber{#1}}{\getrefnumber{#1}}}

\newcommand*{\Chapref}[1]{\nameCref{#1}~\topref{#1}}
\newcommand*{\Chapsref}[1]{\nameCrefs{#1}~\topref{#1}}
\newcommand*{\Chaprefrange}[2]{\nameCrefs{#1}~\topref{#1} to~\topref{#2}}

\newcommand*{\Chaprefand}[2]{\nameCrefs{#1}~\topref{#1} and~\topref{#2}}

% Footnote layout (koma)
% \makebox left-aligned numbers.
\deffootnote{2.0em}{1.5em}{\makebox[2.0em][l]{\thefootnotemark.\ }}
\addtokomafont{footnotereference}{\small}

% Detect the footnote immediately prior to CenturyFootnote
\newwrite\fnC
\immediate\openout\fnC=\jobname.fn100
\let\oldfootnote\footnote
\renewcommand{\footnote}[1]{\oldfootnote{#1}\immediate\write\fnC{
    \thefootnote}}
```

```latex
% Placed just before footnote exceeds 100.
\newcommand*{\CenturyFootnote}{\label{@CenturyFootnote@@@\thefootnote}
    \zsavepos{@CenturyFootnote@z}\immediate\closeout\fnC\deffootnote{2.4
    em}{1.9em}{\makebox[2.4em][r]{\thefootnotemark.\ \ }}}}


% Make url formatting the same
\urlstyle{same}

\DeclareCaptionFont{Orange}{\color{Orange}}
\DeclareCaptionJustification{nohyphen}{\hyphenpenalty=10000}
\captionsetup{justification=nohyphen, singlelinecheck=false}

% Boxes
\crefname{boxe}{Box}{Boxes}
\Crefname{boxe}{Box}{Boxes}
\DeclareFloatingEnvironment[listname={List of boxes}, name = {Box}]{boxe}


\counterwithout{boxe}{chapter}
\counterwithout{footnote}{chapter}

\mdfdefinestyle{GrattanFrameBox}{%
    linecolor=Orange,
    nobreak=true, % prevents page breaking
    outerlinewidth=0.5pt,
    innertopmargin=0.5\baselineskip,
    innerbottommargin=0.5\baselineskip,
    innerrightmargin=11pt,
    innerleftmargin=11pt,
    backgroundcolor=OrangeBackground
    }

\mdfdefinestyle{GrattanFrameBoxUltra}{%
    linecolor=Orange,
    nobreak=true, % prevents page breaking
    outerlinewidth=0.5pt,
    innertopmargin=0.5\baselineskip,
    innerbottommargin=0.75\baselineskip,
    innerrightmargin=11pt,
    innerleftmargin=11pt,
    backgroundcolor=OrangeBackground
    }
```

```latex
% Purpose not merely to provide consistent formatting of
% box titles but also to restore caption to normal after caption is
    complete
\newcommand{\@boxcaption}[1]{%
  \captionsetup{labelfont     = {bf, Orange},
              font            = {bf, Orange},
              format          = plain,
              justification   = raggedright,
              singlelinecheck = false,
              skip            = 0ex,
              position        = above}
  \caption{#1}
  \captionsetup{format  = plain,
              font      = {small, bf, theGrey},
              labelfont = {small, bf, theGrey},
              position  = above,
              skip      = 0pt}
}

% Issue #27
\AtBeginEnvironment{mdframed}{\renewcommand{\thempfootnote}{\alph{
    mpfootnote}}}

% The verysmallbox is intended to be a fraction of one column.
\newenvironment{verysmallbox}[3][htb]{%
  \setlength{\currentparskip}{\parskip}% save the value
  \begin{boxe}[#1]
    \begin{mdframed}[style=GrattanFrameBox]%
    \setlength{\parskip}{\currentparskip} % restore the value
    \@boxcaption{#2\label{#3}}
    \RaggedRight
  }{
    \end{mdframed}%
  \end{boxe}}

% The smallbox is a box intended for onecolumn.
\newenvironment{smallbox}[3][p]{%
  \setlength{\currentparskip}{\parskip}% save the value
  \begin{boxe}[#1]
    \begin{minipage}[\textheight]{\linewidth}
      \begin{mdframed}[style=GrattanFrameBox]%
      \setlength{\parskip}{\currentparskip} % restore the value
```

```latex
      \@boxcaption{\zsavepos{smallbox@@@#3}#2\label{#3}\label{smallbox@@@
          #3}}
      \RaggedRight
}{%
      \end{mdframed}%
    \null\vfill\null%
  \end{minipage}%
\end{boxe}
}

% smallbox but centred in the one page
\newenvironment{centredsmallbox}[2]{%
  \setlength{\currentparskip}{\parskip}% save the value
  \@dblfloat{boxe}
  \centering
    \begin{minipage}[\textheight]{\columnwidth}
      \begin{mdframed}[style=GrattanFrameBox]%
      \setlength{\parskip}{\currentparskip} % restore the value
      \@boxcaption{#1\label{#2}}
      \RaggedRight
}{%
      \end{mdframed}%
    \null\vfill\null%
  \end{minipage}%
\end@dblfloat
}

\newcommand{\@addboxcaption}[1]{%
\captionsetup{labelfont={bf,Orange},font={bf,Orange},format=plain,
    justification=raggedright,singlelinecheck=false, skip=0ex, position=
    above}
\caption*{#1}
\captionsetup{format=plain,font={small,bf,theGrey},labelfont={small,bf,
    theGrey}, position=above, skip=0pt}
}

\newenvironment{addsmallbox}[3][htb]{%
  \setlength{\currentparskip}{\parskip}% save the value
  \begin{boxe}[#1]
  \begin{mdframed}[style=GrattanFrameBox]%
  \setlength{\parskip}{\currentparskip}% restore the value
  \@addboxcaption{#2\label{#3}}%
  \RaggedRight
```

```
}{
  \end{mdframed}%
  \end{boxe}%
}

% Big boxes -- over the whole page
% It is recommended to surround this with an \afterpage{%
\newenvironment{bigbox}[2]{
\begin{bigbox*}{#1}{#2}
}{
\end{bigbox*}}

% dbl floats
\newenvironment{bigbox*}[2]{%
  \setlength{\currentparskip}{\parskip}
  \@dblfloat{boxe}%
  \begin{mdframed}[style=GrattanFrameBox]
  \@boxcaption{#1\label{#2}}%
  % Reduced column sep
  \addtolength{\columnsep}{-23.8pt}%
  \begin{multicols}{2}
  \setlength{\parskip}{\currentparskip}% restore the value
  \RaggedRight
}{%
  \end{multicols}\end{mdframed}
  \end@dblfloat
}

\newenvironment{ultrabox}[2]{\onecolumn\setlength{\currentparskip}{
    \parskip}
\begin{boxe}
\pagecolor{OrangeBackground}
\begin{mdframed}[style=GrattanFrameBoxUltra]%
\setlength{\columnsep}{10mm}
\begin{minipage}[t][\textheight][t]{\textwidth} % textheight
\begin{multicols}{2}
\setlength{\parskip}{\currentparskip}% restore the value
 \captionsetup{labelfont={bf,Orange}, font={bf,Orange}, format=plain,
    justification=justified,singlelinecheck=false}
 \caption{#1}\label{#2}%
 } {\end{multicols}\end{minipage}\end{mdframed}\end{boxe}%
 \clearpage\twocolumn\nopagecolor}
```

```latex
% Captions in general
\DeclareCaptionFont{theGrey}{\color{theGrey}}
\captionsetup{
  format   = plain,
  font     = {small, bf, theGrey},
  labelfont = {small, bf, theGrey},
  aboveskip = 1pt
}
% suppress hyphenation in caption
\DeclareCaptionJustification{nohyphen}{\hyphenpenalty=10000}
\captionsetup{justification=nohyphen}

\newcommand{\units}[1]{%
  \captionsetup{font={small,color=theGrey}, aboveskip=0pt, belowskip=0pt}

  \caption*{#1}
}

\newcommand{\captionwithunits}[2]{%
  \captionsetup{format=plain,font={small,bf,theGrey},labelfont={small,bf,
      theGrey}, justification=raggedright,
  singlelinecheck=false,position=top,skip=0pt}
  \caption{#1}
  \units{#2}
}

\newcommand{\captionoffigurewithunits}[2]{%
  \captionsetup{format=plain,font={small,bf,theGrey},labelfont={small,bf,
      theGrey}, justification=raggedright,
  singlelinecheck=false}
  \captionof{figure}{#1}
  \vspace{-11pt}
  \captionsetup{font={small,color=theGrey}}
  \caption*{#2}
}

% New user friendly (less typing) \Caption?
\newcommand{\Caption}[3]{\captionwithunits{#1}{#2}\label{#3}}

%% Credit to amsthm.sty
\def\@addpunct#1{%
  \relax\ifhmode
```

```latex
    \ifnum\spacefactor>\@m \else#1\fi
  \fi}

\newcommand*{\source}[1]{%
  \captionsetup{format=plain, font={footnotesize, it}, skip=3pt,
     justification=RaggedRight, singlelinecheck=false, position=below}
  \caption*{Source:\ #1\@addpunct{.}}
}

\newcommand*{\notes}[1]{%
  \captionsetup{format=plain, font={footnotesize, it}, skip=3pt,
     justification=RaggedRight, singlelinecheck=false, position=below}
  \caption*{Notes:\ #1\@addpunct{.}}
}

\newcommand*{\sources}[1]{%
  \captionsetup{format=plain, font={footnotesize, it}, skip=3pt,
     justification=RaggedRight, singlelinecheck=false, position=below}
  \caption*{Sources:\ #1\@addpunct{.}}
}

\newcommand*{\note}[1]{%
  \captionsetup{format=plain, font={footnotesize, it}, skip=3pt,
     justification=RaggedRight, singlelinecheck=false, position=below}
  \caption*{Note:\ #1\@addpunct{.}}
}

\newcommand*{\noteswithsource}[2]{%
  \ifstrempty{#2}{\ClassWarning{'\noteswithsource' has second argument
     empty}}{}%
  \captionsetup{format=plain, font={footnotesize, it}, skip=2.5pt,
     justification=RaggedRight, singlelinecheck=false, position=below}
  \caption*{Notes:\ #1\@addpunct{.}}
  \caption*{Source:\ #2\@addpunct{.}}
}

\newcommand*{\notewithsource}[2]{%
  \ifstrempty{#2}{\ClassWarning{'\notewithsource' has second argument
     empty}}{}%
  \captionsetup{format=plain, font={footnotesize, it}, skip=2.5pt,
     justification=RaggedRight, singlelinecheck=false, position=below}
  \caption*{Note:\ #1\@addpunct{.}}
  \caption*{Source:\ #2\@addpunct{.}}
```

```
}

\newcommand*{\notewithsources}[2]{%
  \ifstrempty{#2}{\ClassWarning{'\notewithsources' has second argument
      empty}}{}%
  \captionsetup{format=plain, font={footnotesize, it}, skip=2.5pt,
      justification=RaggedRight, singlelinecheck=false, position=below}
  \caption*{Note:\ #1\@addpunct{.}}
  \caption*{Sources:\ #2\@addpunct{.}}
}

\newcommand*{\noteswithsources}[2]{%
  \ifstrempty{#2}{\ClassWarning{'\noteswithsources' has second argument
      empty}}{}%
  \captionsetup{format=plain, font={footnotesize, it}, skip=2.5pt,
      justification=RaggedRight, singlelinecheck=false, position=below}
  \caption*{Notes:\ #1\@addpunct{.}}
  \caption*{Sources:\ #2\@addpunct{.}}
}

\newcommand*{\boxsources}[1]{\footnotesize\textit{#1}\@addpunct{.}}

% More consistent fonts for quotes:
\AtBeginEnvironment{quote}{\small\justifying}

\setkomafont{disposition}{\color{Orange}}
\addtokomafont{chapter}{\bfseries\Large}
\addtokomafont{section}{\bfseries\normalsize}
\addtokomafont{subsection}{\bfseries\normalsize}
\addtokomafont{subsubsection}{\normalsize}

% Spacing
\RedeclareSectionCommand[
  beforeskip=1\baselineskip,
  afterskip=1\baselineskip]{chapter}
\RedeclareSectionCommand[
  beforeskip=0.5\baselineskip plus 0.3\baselineskip,
  afterskip=0.5\baselineskip]{section}
\RedeclareSectionCommand[
  beforeskip=0.5\baselineskip plus 0.2\baselineskip,
  afterskip=0.5\baselineskip]{subsection}
\RedeclareSectionCommand[
  beforeskip=0.5\baselineskip plus 0.1\baselineskip,
```

```
  afterskip=0.5\baselineskip]{subsubsection}
\RedeclareSectionCommand[
  beforeskip=.5\baselineskip,
  afterskip=-1em]{paragraph}
\RedeclareSectionCommand[
  beforeskip=-.5\baselineskip,
  afterskip=-1em]{subparagraph}

\renewcommand*{\@seccntformat}[1]{\csname the#1\endcsname\hspace{1.25em}}


% Removes glue around section titles.
\RequirePackage{xpatch}
\xapptocmd{\sectionlinesformat}{\vspace*{-\parskip}}{}{\PatchFailed}

% Named appendix: Appendix A not just 'A'
\providecommand*\appendixmore{}
\renewcommand*\appendixmore{%
    \renewcommand*{\chapterformat}{%
      \mbox{\appendixname~\thechapter\autodot:\enskip}%
    }%
}


% --------------
%
% Grattan twocolumn
%
%--------------

% N.B. geometry must be after hyperref, and hence cleveref


\RequirePackage[
  landscape,
  twocolumn,
  left=2.30cm,
  right=2.30cm,
  top=74pt,
  headsep=22pt,
  bottom=71.5pt,
  headheight=25.5pt,
  footskip=25.5pt,
```

```latex
]{geometry}

\setlength{\columnsep}{55pt}
\setlength{\footheight}{18pt}

% Spacing between paragraphs
% <indent> <distance> <last line end space>
\setparsizes{0pt}{0.6\baselineskip plus 0.25\baselineskip minus 0.1
    \baselineskip}{0pt plus 1fil}

% Space between body text and footnote area:
\addtolength{\skip\footins}{1pt plus 14pt}

% Ensures hyperlinked chapter headings refer to their referent headings
% not the preceding baseline
% Add extra hyper target for chapter: chapter..\thechapter
\renewcommand*{\chapterformat}{%
  \mbox{\raisebox{25pt}[0pt][0pt]{\hypertarget{chapter..\thechapter}{}}%
      Add
    \chapappifchapterprefix{\nobreakspace}\thechapter\hspace{1em}\autodot
      \enskip}%
}

% Update \addcontentsline to jump to new hyper target _only_ if \chapter
    is used
\patchcmd{\addcontentsline}% <cmd>
  {\Hy@writebookmark}% <search>
  {\ifnum\pdfstrcmp{chapter}{#2}=0 % Chapter mark
    \edef\@currentHref{page.\thepage}%
   \fi
   \Hy@writebookmark}% <replace>
  {}{}% <success><failure>


 % Requests forcefully that figures refrain from
% appearing in the first column. This will fail
% should a \clearpage be experienced.
\g@addto@macro\@floatplacement{%
\if@firstcolumn
\global\@colnum\z@
\fi
}
```

```latex
\g@addto@macro\@floatplacement{%
\if@firstcolumn
\@fpmin\textheight
\fi
}


%% --------------------------------
%  Headers and footers
%% --------------------------------
\RequirePackage[headsepline=1pt,plainheadsepline,footsepline=1pt,
    plainfootsepline]{scrlayer-scrpage}




\clearscrheadings
\clearscrplain
\clearscrheadfoot
% -------
% Heads and footers
%
\RequirePackage{eso-pic}
\newcommand{\classification}{}

% Use Embargo text if declared
\newcommand*{\@EmbargoText}{\null}
\newcommand*{\@EmbargoTitleText}{\null}
\DeclareOption{embargoed}{
  \newcommand*{\EmbargoDate}[1]{\renewcommand{\@EmbargoDate}{#1}}
  \newcommand*{\@EmbargoDate}{XXXX}
  \newcommand*{\EmbargoText}[1]{\renewcommand{\@EmbargoText}{#1}}
  \renewcommand*{\@EmbargoText}{Embargoed until 9 pm \@EmbargoDate}
  \newcommand*{\EmbargoTitleText}[1]{\renewcommand{\@EmbargoTitleText
      }{#1}}
  \renewcommand*{\@EmbargoTitleText}{\@EmbargoText}
}

% Avoid spaces or newlines in the following commands' arguments: they
% may cause errors.
% Furthermore, optional arguments are required: they appear in Chapter
% heading pages. Leaving them out will reset the titles on pages with
% \chapter{}
```

```latex
\lehead[\normalfont\textcolor{theGrey}{\mytitle}{\huge\strut}]{
    \normalfont\textcolor{theGrey}{\mytitle}{\huge\strut}}
\lohead[\normalfont\textcolor{theGrey}{\mytitle}{\huge\strut}]{
    \normalfont\textcolor{theGrey}{\mytitle}{\huge\strut}}
\rehead[\classification\@EmbargoText]{\classification\@EmbargoText}
\rohead[\classification\@EmbargoText]{\classification\@EmbargoText}
\ifoot[{\textcolor{theGrey}{\normalfont Grattan Institute \@YEAR {\Large
    \strut}}}]{\textcolor{theGrey}{\normalfont Grattan Institute \@YEAR}{
    \Large\strut}}
\cfoot[\classification]{\classification}
\ofoot[\normalfont\textcolor{theGrey}{\thepage}]{\normalfont\textcolor{
    theGrey}{\thepage}}

\setkomafont{headsepline}{\color{Orange}}
\setkomafont{footsepline}{\color{Orange}}


% Figure parameters ----------------------
%\renewcommand{\floatpagefraction}{0.75}

% length of fptop is magical: equal to the
\newlength{\@chaproom}
\setlength{\@chaproom}{33.64366pt}
\setlength{\@fptop}{36.64366pt minus 36.64366pt}
\let\oldtryfcolumn=\@tryfcolumn
\def\@tryfcolumn{\addtolength{\@fptop}{\dimexpr \@colht-\textheight}%
  \oldtryfcolumn}
\setlength{\@fpbot}{36.64366pt plus 1fil minus 36.64366pt}
\setkeys{Gin}{width=\columnwidth}

\newenvironment{figureTop}{
\begin{figure}
\begin{minipage}[t][\textheight]{\linewidth}
\vspace{1pt}
}{%
\end{minipage}
\end{figure}
}

% For two figures on one page (with possible space for text underneath)
\newcommand{\doublecolumnfigure}[2]{
  \begin{figure*}
    \begin{minipage}[t][\textheight]{\columnwidth}
```

```latex
      \vspace{\@fptop}
      #1
    \end{minipage}
    \hfill
    \begin{minipage}[t][\textheight]{\columnwidth}
      \vspace{\@fptop}
      #2
    \end{minipage}
  \end{figure*}
}

% Ensure pdfs are used first
\DeclareGraphicsExtensions{%
    .pdf,.PDF,%
    .png,.PNG,%
    .jpg,.mps,.jpeg,.jbig2,.jb2,.JPG,.JPEG,.JBIG2,.JB2}

%% FrontPage options
%% First, the default, plain front page with a title.
\newcommand*{\titleTH}{\begingroup % Create the command for including
    the title page in the document
\raggedleft % Right-align all text
\vfil
\phantom{.}\hfill

\IfFileExists{GrattanSVGLogo.pdf}{\includegraphics[width=0.225
    \paperwidth,keepaspectratio]{GrattanSVGLogo}}{\includegraphics[width
    =0.225\paperwidth,keepaspectratio]{./logos/GrattanSVGLogo}}
\vspace{30pt}
\vfil % Whitespace at the top of the page
{\bfseries\textcolor{Orange}{\fontsize{30}{35}\selectfont \mytitle}}\\[
    \baselineskip] % Title page font size
{\bfseries\fontsize{18}{35}\selectfont \textcolor{Orange}{\mysubtitle}}
    \\[\baselineskip]

{\LARGE \myauthor}

\vfil

{\LARGE\bfseries\@EmbargoTitleText\hfill\null}

\vfill% Whitespace at the bottom of the page
\endgroup}
```

```latex
\newcommand{\BackgroundPic}{}

% Alternatively, if FrontPage is declared, the file there is used as the
    frontpage picture
\DeclareOption{FrontPage}{
  \IfFileExists{./FrontPage/FrontPage.pdf}{%
      %\includegraphics[width=\paperwidth,keepaspectratio]{./FrontPage/
        FrontPage}%
    }{
      \ClassError{grattan}{%
      './FrontPage/FrontPage.pdf' does not exist
      }{%
      You have asked for a fullpicture option, but we can't find
      a file at './FrontPage/FrontPage.pdf'. Try placing the image
      there or not using the fullpicture option.
    }
    }
  \renewcommand\BackgroundPic{%
    \put(0,0){%
    \parbox[b][\paperheight]{\paperwidth}{%
    \vfill
    \centering
    % Amend
    \IfFileExists{./FrontPage/FrontPage.pdf}{%
      \includegraphics[width=\paperwidth,keepaspectratio]{./FrontPage/
        FrontPage.pdf}%
    }{
      \ClassError{grattan}{%
        './FrontPage/FrontPage' does not exist
      }{%
        You have asked for a fullpicture option, but we can't find
        a file at './FrontPage/FrontPage'. Try placing the image
        there or not using the fullpicture option.
      }
    }
  \vfill
  }}}
  \renewcommand{\titleTH}{} % FrontPage should be entire.

}

\DeclareOption{continuous}{%
  \KOMAoption{listof}{nochaptergap}
```

```latex
  \addtocontents{lof}{\linespread{1.3}\selectfont}% optical
  \addtocontents{lot}{\linespread{1.3}\selectfont}% optical
  \counterwithout{figure}{chapter}
  \counterwithout{table}{chapter}
}

\newcommand*{\@pagetwo}{%
  \begin{minipage}[t][0.85\textheight][t]{\columnwidth}
  \subsection*{Grattan Institute Support}
  \begin{multicols}{2}
  \setlength{\parskip}{4pt plus 8pt minus 5pt}
  \textbf{\textcolor{theGrey}{\normalsize Founding members}}\hfill\par
  \vspace{-40pt}
  {\centering

  \IfFileExists{aus-gov-logo-stacked-black.pdf}%
    {\includegraphics[width=3.75cm]{aus-gov-logo-stacked-black}}%
    {\includegraphics[width=3.75cm]{./logos/aus-gov-logo-stacked-black}}

  \IfFileExists{Vic_Gov_Logo-2016.pdf}%
    {\includegraphics[width=3.25cm]{Vic_Gov_Logo-2016}}%
    {\includegraphics[width=3.25cm]{./logos/Vic_Gov_Logo-2016}}

  \IfFileExists{UOM-Pos_S_PMS.pdf}%
    % Too much whitespace on top:
    % l t r b
    {\includegraphics[trim = {0 2cm 0 2cm}, clip, width=3.5cm]{UOM-Pos_S_
        PMS}}%
    {\includegraphics[trim = {0 2cm 0 2cm}, clip, width=3.5cm]{./logos/
        UOM-Pos_S_PMS}}%


  \IfFileExists{Bhp.pdf}%
    {\includegraphics[width=3.25cm]{Bhp}}%
    {\includegraphics[width=3.25cm]{./logos/Bhp}}%
% par is necessary to centre the last logo
  \par}
  \columnbreak\par
  \footnotesize
  \textbf{\textcolor{theGrey}{\normalsize Endowment Supporters}}

  The Myer Foundation
```

```
National Australia Bank

Susan McKinnon Foundation

\vspace{15pt}

\textbf{\textcolor{theGrey}{\normalsize Affiliate Partners}}

Medibank Private

Susan McKinnon Foundation

\vspace{15pt}

\textbf{\textcolor{theGrey}{\normalsize Senior Affiliates}}

Google

Maddocks

PwC

McKinsey \& Company

The Scanlon Foundation

Wesfarmers

\vspace{15pt}

\textbf{\textcolor{theGrey}{\normalsize Affiliates}}

Ashurst

Corrs

Deloitte

GE ANZ

Jemena

Urbis
```

```latex
  Westpac

  Woodside\rule[-1.5ex]{0pt}{0pt} % for BHp
  \end{multicols}
  \end{minipage}
  \eject \normalsize
  \begin{minipage}[t][0.85\textheight][t]{\columnwidth}
    \subsection*{Grattan Institute \@Report\ No. \@GrattanReportNumber,
        \@MONTH\ \@YEAR}
    \setlength{\parskip}{5.5pt plus 2pt}
    \raggedright\@acknowledgements
  \end{minipage}
  \twocolumn
}

\newcommand*{\@checkGrattanReportNumberdefined}{
  \ifdefempty{\@GrattanReportNumber}%
    {\ClassError{You have not provided a Grattan Report Number}}%
    {}%
}

\DeclareOption{submission}{
  % A submission has no special page two
  \renewcommand*{\@pagetwo}{
    \ifdefempty{\@acknowledgements}{}{\ClassWarning{grattan}{Using option
        'submission', but 'acknowledgements' defined.}}
    \ifdefempty{\@GrattanReportNumber}{}{\ClassWarning{grattan}{Using
        option 'submission', but 'GrattanReportNumber' defined.}}
  }
  \renewcommand*{\@checkGrattanReportNumberdefined}{}
}

\ProcessOptions\relax

% Bibliography
\RequirePackage[english]{babel}
\RequirePackage{csquotes}
\RequirePackage[
  backend=biber,
  singletitle,
  style=authoryear-ibid,
  ibidtracker=constrict, % avoid ibids from figures being confusing
```

```
  autocite=footnote,
  maxcitenames=2,
  maxbibnames=9,
  uniquelist=false,
  uniquename=init,
  sorting=anyt,
  date=year, % else bibliography will be e.g. ATO (Jul. 10, 2016c)
  labelalpha,
  maxalphanames=1
]{biblatex}

\@ifpackagelater{biblatex}{2016/09/01}{%
% Maintain backwards-compatibility between these dates
  \@ifpackagelater{biblatex}{2017/11/04}{
    \DeclareLabelalphaTemplate{\labelelement{\field{labelname}\field{
        labelyear}}}
    \DeclareSortingTemplate{gratt}{\sort{\field{labelalpha}}\sort{\field{
        labelyear}}\sort{\field{author}}}
    \ExecuteBibliographyOptions{sorting=gratt}

    \newtoggle{bbx:dowehavemorenames}
    \DeclareNameFormat{dowehavemorenames}{%
     \ifboolexpr{
       test {\ifnumequal{\value{listcount}}{\value{liststop}}}
       and
       test \ifmorenames
     }
       {\global\toggletrue{bbx:dowehavemorenames}}
       {\global\togglefalse{bbx:dowehavemorenames}}}

    \newcounter{mymaxcitenames}
    \AtBeginDocument{%
     \setcounter{mymaxcitenames}{\value{maxnames}}%
    }

    \renewbibmacro*{begentry}{%
      \begingroup
        \defcounter{maxnames}{\value{mymaxcitenames}}%
        \printnames[dowehavemorenames]{labelname}%
        \iftoggle{bbx:dowehavemorenames}
          {\printnames{labelname}%
           \setunit{\printdelim{nameyeardelim}}%
           \usebibmacro{date+extradate}%
```

```latex
        \space\space\newunit\newblock}
        {}%
    \endgroup
    \iftoggle{bbx:dowehavemorenames}{\renewbibmacro*{date+extradate
        }{}}{}%
  }
}{
%% biblatex version 3.7
  \DeclareLabelalphaTemplate{\labelelement{\field{labelname}\field{
      labelyear}}}
  \DeclareSortingScheme{gratt}{\sort{\field{labelalpha}}\sort{\field{
      labelyear}}}
  \ExecuteBibliographyOptions{sorting=gratt}

  \newtoggle{bbx:dowehavemorenames}
  \DeclareNameFormat{dowehavemorenames}{%
   \ifboolexpr{
     test {\ifnumequal{\value{listcount}}{\value{liststop}}}
     and
     test \ifmorenames
   }
     {\global\toggletrue{bbx:dowehavemorenames}}
     {\global\togglefalse{bbx:dowehavemorenames}}}

  \newcounter{mymaxcitenames}
  \AtBeginDocument{%
   \setcounter{mymaxcitenames}{\value{maxnames}}%
  }

  \renewbibmacro*{begentry}{%
    \begingroup
      \defcounter{maxnames}{\value{mymaxcitenames}}%
      \printnames[dowehavemorenames]{labelname}%
      \iftoggle{bbx:dowehavemorenames}
        {\printnames{labelname}%
         \setunit{\printdelim{nameyeardelim}}%
         \usebibmacro{date+extrayear}%
         \space\space\newunit\newblock}
        {}%
    \endgroup
    \iftoggle{bbx:dowehavemorenames}{\renewbibmacro*{date+extrayear
        }{}}{}%
  }
```

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```
  }
}%
% do nothing
{}


\DeclareLanguageMapping{english}{british-apa}
\DeclareNameAlias{author}{last-first} % for last name, first name in
    bibliography
\DeclareFieldFormat{type}{\unskip\space} % suppress Tech Rep
\renewbibmacro{in:}{} % suppress In:
\renewbibmacro{bbx:editor}{} % suppress Ed:


%% Bibliography formatting
% separating entries
\setlength\bibitemsep{1.5\itemsep}
% format bibliography
\renewcommand*{\bibfont}{\small\raggedright}

% Allow URLs to break on any character
  % Increase penalty for page-breaks within entry from 5000 to 10,000 (
      infinity)
  \patchcmd{\bibsetup}{\interlinepenalty=5000}{\interlinepenalty
      =10000}{}{}
\let\origbibsetup\bibsetup
\renewcommand{\bibsetup}{%
  \origbibsetup%
  \expandafter\def\expandafter\UrlBreaks\expandafter{\UrlBreaks% save
      the current one
    \do\a\do\b\do\c\do\d\do\e\do\f\do\g\do\h\do\i\do\j%
    \do\k\do\l\do\m\do\n\do\o\do\p\do\q\do\r\do\s\do\t%
    \do\u\do\v\do\w\do\x\do\y\do\z\do\A\do\B\do\C\do\D%
    \do\E\do\F\do\G\do\H\do\I\do\J\do\K\do\L\do\M\do\N%
    \do\O\do\P\do\Q\do\R\do\S\do\T\do\U\do\V\do\W\do\X%
    \do\Y\do\Z}
}
\DeclareFieldFormat{url}{\textcolor{blue}{\url{#1}}}


%% Citation tweaking
\DeclareFieldFormat{titlecase}{#1}
\setlength\bibhang{.5in}
\renewcommand*{\bibnamedash}{%
```

```
  \ifdimless{\leftmargin}{0.75em}
    {\mbox{\textemdash\space}}
    {\makebox[\leftmargin][l]{%
       \ifdimless{\leftmargin}{1.25em}
         {\textendash}
         {\rule{0.8\bibhang}{.2pt}}}}}}
% Hyperlinks entire citation label for most citaiton commands
% http://tex.stackexchange.com/questions/15951/hyperlink-name-with-
   biblatex-authoryear-biblatex-1-4b
\DeclareFieldFormat{citehyperref}{%
  \DeclareFieldAlias{bibhyperref}{noformat}% Avoid nested links
  \bibhyperref{#1}}

\DeclareFieldFormat{textcitehyperref}{%
  \DeclareFieldAlias{bibhyperref}{noformat}% Avoid nested links
  \bibhyperref{%
    #1%
    \ifbool{cbx:parens}%
      {\bibcloseparen\global\boolfalse{cbx:parens}}%
      {}}}

\savebibmacro{cite}
\savebibmacro{textcite}

\renewbibmacro*{cite}{%
  \printtext[citehyperref]{%
    \restorebibmacro{cite}%
    \usebibmacro{cite}}}

\newbibmacro*{cite:title}{%
  \ifsingletitle
    {}
    {\printtext[bibhyperref]{%
       \printfield[citetitle]{labeltitle}}}}

\renewbibmacro*{textcite}{%
  \ifboolexpr{%
    ( not test {\iffieldundef{prenote}} and
      test {\ifnumequal{\value{citecount}}{1}} )
    or
    ( not test {\iffieldundef{postnote}} and
      test {\ifnumequal{\value{citecount}}{\value{citetotal}}} )
  }%
```

```
    {\DeclareFieldAlias{textcitehyperref}{noformat}}
    {}%
  \printtext[textcitehyperref]{%
    \restorebibmacro{textcite}%
    \usebibmacro{textcite}}}}

% The following lines give the correct footcite Author (Year) but make
   the ibid erroneous
% Author (ibid) % use ifciteibid
\DeclareCiteCommand{\footcite}[\mkbibfootnote]
  {\boolfalse{cbx:parens}}
  {\usebibmacro{citeindex}%
  % https://github.com/grattaninstitute/AP-Housing-affordability-2017/
     commit/55757ed2c625d4e18ada5a71edfdb5fbd88f56d1
  % Ibid. -> Ibid\adddot
  % Otherwise the . in Ibid. is interprted as the end of a sentence
  % which means the first letter in a postnote will be uppercase
  \ifciteibid{Ibid\adddot}{% % for ibidem
   \iffirstcitekey
     {\setcounter{textcitetotal}{1}}
     {\stepcounter{textcitetotal}%
      \textcitedelim}%
   \usebibmacro{textcite}}%
   }
  {\ifbool{cbx:parens}
     {\bibcloseparen\global\boolfalse{cbx:parens}}
     {}}
  {\usebibmacro{textcite:postnote}}
\newcommand{\gcite}[1]{{\citeauthor{#1} (\citedate{#1})}}
% removes intersentence space after et al.
%\xpatchcmd\citeauthor{\begingroup}{\begingroup\aftergroup\@}{}{}
%\xpatchcmd\textcite{\begingroup}{\begingroup\aftergroup\@}{}{}
\DefineBibliographyStrings{british}
   {andothers = {et al.\hskip 0pt}}

% biblatex ShareLaTeX version control
% 2016/09/17
\@ifpackagelater{biblatex}{2016/09/01}{\ExecuteBibliographyOptions{
   giveninits=true}}{\ExecuteBibliographyOptions{firstinits=true}}
% Patch for issue
\AtBeginDocument{%
  \apptocmd\@floatboxreset
    {\booltrue{citetracker}%
```

```latex
    \booltrue{pagetracker}}
    {}
    {\blx@err@patch{floats}}
}


\RequirePackage{multicol}
\newcommand{\logoskip}{\par\vspace{16pt}}

\newcommand*{\ReportOrWorkingPaper}[1]{\renewcommand*{\@Report}{#1}}
\newcommand{\@Report}{Report}

\newcommand*{\GrattanReportNumber}[1]{\renewcommand*{
    \@GrattanReportNumber}{#1}}
\newcommand{\@GrattanReportNumber}{}

\AtBeginDocument{%
  \@checkGrattanReportNumberdefined{}
}

%% BibLaTeX needs to precede acknowledgements (otherwise
    acknowledgements can't contain citations).

% Allow MONTH/YEAR to be defined; otherwise by default the date of
    compilation
\newcommand*{\MONTH}[1]{\renewcommand*{\@MONTH}{#1}}
\newcommand{\@MONTH}{%
  \ifcase\the\month
  \or January% 1
  \or February% 2
  \or March% 3
  \or April% 4
  \or May% 5
  \or June% 6
  \or July% 7
  \or August% 8
  \or September% 9
  \or October% 10
  \or November% 11
  \or December% 12
  \fi}

\newcommand*{\YEAR}[1]{\renewcommand*{\@YEAR}{#1}}
\newcommand{\@YEAR}{\the\year}
```

```latex
\newcommand\acknowledgements[1]{\renewcommand\@acknowledgements{#1}}
\newcommand\@acknowledgements{}

\newcommand*{\ISBN}[1]{\renewcommand*{\@ISBN}{#1}}
\newcommand{\@ISBN}{}

\RequirePackage{tabularx}
\AtBeginEnvironment{tabular}{\small}
\AtBeginEnvironment{tabularx}{\small}
\newcolumntype{R}{>{\RaggedLeft\arraybackslash}X}
\newcolumntype{Q}{>{\raggedleft\arraybackslash}X}

\AtBeginDocument{%
  \pagestyle{empty}
  \let\mytitle\@title
  \let\mysubtitle\@subtitle
  \let\myauthor\@author

  % TitlePage
  \onecolumn
  \AddToShipoutPicture*{\BackgroundPic}
  \phantom{.}\hfill\titleTH
  \ClearShipoutPicture
  \clearpage
  \twocolumn
  % use microtype

  %
% Following page.
\pagestyle{scrheadings}
\@pagetwo
}

% Table of contents
\setcounter{tocdepth}{0}

\newlength{\currentparskip}

% Designing the overview
% ---
% We define a new environment that take as its contents the text of the
```

```latex
% overview, placing it with a chapter* heading 'Overview' all on the
    same
% page.
\newlength{\overviewExtra}
\setlength{\overviewExtra}{0pt}
\newenvironment{overview}[1][]%
% vspace{-24.5pt} should align Overview baseline with chapter baseline
% Putting \label outside \addchap causes inconsistent chapter breaks
  {\onecolumn\vtop to 0pt\bgroup\ifstrempty{#1}{\vspace{-24.5pt}}{
      \vspace{#1}}\addchap{Overview\label{chap:Overview}}\addtolength{
      \columnsep}{\overviewExtra}\begin{multicols}{2}}%
  {\end{multicols}\addtolength{\columnsep}{-\overviewExtra}\vss\egroup
      \hfill\twocolumn}

\newenvironment{summary}%
  {\onecolumn\vtop to 0pt\bgroup\vspace{-25pt}\chapter*{Summary}\begin{
      multicols}{2}}%
  {\end{multicols}\vss\egroup\hfill\twocolumn}

\newenvironment{onepager}[1]%
  {\onecolumn\vtop to 0pt\bgroup\vspace{-25pt}\chapter*{#1}\begin{
      multicols}{2}}%
  {\end{multicols}\vss\egroup\hfill\twocolumn}

\newlength{\recommendationExtra}
\setlength{\recommendationExtra}{0pt}
\newenvironment{recommendations}[1][]%
  {\onecolumn\vtop to 0pt\bgroup\ifstrempty{#1}{\vspace{-24.5pt}}{
      \vspace{#1}}\addchap{Recommendations}\label{chap:Recommendations}
      \addtolength{\columnsep}{\recommendationExtra}\begin{multicols}{2}}
      %
  {\end{multicols}\addtolength{\columnsep}{-\recommendationExtra}\vss
      \egroup\hfill\twocolumn}

\newcounter{reco}
\crefalias{reco}{rec}
\Crefname{reco}{Recommendation}{Recommendations}
\Crefname{rec}{Recommendation}{Recommendations}
\newcommand*{\recommendation}[1]{{\subsection*{Recommendation
    \refstepcounter{reco}\thereco: #1}}}

\newcounter{subreco}
```

```latex
\newcommand*{\subrecommendation}[1]{{\color{Orange}\refstepcounter{
    subreco}Rec.\hspace{4pt}\thereco\alph{subreco}: {#1}\hspace{0.4em}}}


\RequirePackage{tocloft}
\renewcommand{\cftchapfont}{\normalsize\normalfont}
\renewcommand{\cftchapdotsep}{4.5}
\renewcommand{\cftchappagefont}{\normalfont}
\renewcommand{\cftdot}{\normalfont .}
\renewcommand{\@pnumwidth}{1em}

% indent of list of figures
\renewcommand{\cftfigindent}{0em}

\AtBeginDocument{\renewcommand{\contentsname}{Table of contents}}
\newcommand{\contentspage}{%
  \onecolumn
  \begin{multicols}{2}
    \phantom{.}
    \vfill
    \columnbreak
    \begingroup
      \raggedright
      \tableofcontents
    \endgroup
  \end{multicols}
  \twocolumn%
}

\newcommand{\oneraggedpage}{\let\mytextbottom\@textbottom
  \let\mytexttop\@texttop
  \raggedbottom
  \afterpage{%
  \global\let\@textbottom\mytextbottom
  \global\let\@texttop\mytexttop}}


% Discretionary commands for consistent treatment of common
    abbreviations
\newcommand*{\eg}{\emph{e.g.}}
\newcommand*{\ie}{\emph{i.e.}}
\newcommand*{\etc}{\emph{etc.}}
```

```
% Helpful for determining which labels are causing infinite reruns.
% https://tex.stackexchange.com/questions/154594/how-to-diagnose-a-
    permanent-labels-may-have-changed-warning?noredirect=1&lq=1

\def\@testdef #1#2#3{%
  \def\reserved@a{#3}\expandafter \ifx \csname #1@#2\endcsname
 \reserved@a \else
\typeout{^^Jlabel #2 changed:^^J%
\meaning\reserved@a^^J%
\expandafter\meaning\csname #1@#2\endcsname^^J}%
\@tempswatrue \fi}

% To detect user's current version
\listfiles
```

Index