

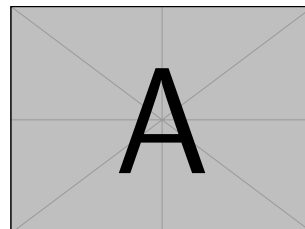
a template for a rather corp_{orate} bore_{ing} re_{port}

*Some thought-provoking
sub-title that inspires
someone to read your
boring report.*

Some Department
A University

Kale Ewasiuk kalekje@gmail.com
Another Example

September 1, 2022



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1 Quick Start

- Install MiKTeX (<https://miktex.org/download>) (do a single user installation)
- This report uses LuaLaTeX—ensure you use `lualatex` to compile and do not use the `pdftex`/`pdflatex` command to compile
- Strongly recommended to use `output-directory=./out` when compiling to push all generated files in a sub-folder
- For the CM-Bright (sans serif) font, you must go to MiKTeX console (hit Windows key and type `miktex` and it should pop up) and manually download `hfbright` and `cm-super` packages by clicking Packages (left menu) and searching, right-click, then install. Or you can run these commands: `mpm --install=hfbright` and `mpm --install=cm-super`
- you should also install markdown package: `mpm --install=markdown`
- Install Perl for the `makeglossaries` package (<https://strawberryperl.com/>) and ensure perl is in the path (used for acronyms)
 - Possibility: If you get an error in the `xindy.pl` script when trying `makeglossaries`, this means a certain folder cannot be found, and we must patch the code to get it working. I've found this issue occurs for admin type installations mostly. Use the error file and line and locate the issue. In the else part, the 'die' statement forces the crash. We must replace this with the following (ensure correct / direction is used):
`$cmd_dir = "C:/Path/To/Where/tex2xindy.exe/is/located";`
 - Common locations are:
 - `C:/Users/Kale/AppData/Roaming/MiKTeX/2.9/miktex/bin/x64`
 - `C:/ProgramFiles/MiKTeX/miktex/bin/x64/internal`

Important note for beginners: When you install MiKTeX, you get a LaTeX installation and package manager. This operates independently of what tool you use to write LaTeX in (TeXStudio, TeXWorks, PyCharm, VScode, notepad). To compile a LaTeX document, you simply need to go to the command line and run a command that more or less says "compile this file". The tool that you use to write your code in just helps execute these commands, captures the output from the compilation process, and helps point to any errors.

This package uses `lualatex` instead of the default `pdftex` command. You should be able to modify TeXStudio or VScode (example below) or whatever you use to make this the default. I also like to push the `.pdf`, and other auxiliary files to an 'out' folder.

Recommended compile command:

```
lualatex -file-line-error -interaction=nonstopmode -synctex=1 -  
output-format=pdf -output-directory=out main.tex
```

Bibliography: `biber main --output-directory ./out`

Glossary/Acronym: `makeglossaries -d ./out main`

PDF viewer: I like Sumatra as you can leave a PDF open in it and still re-compile (Adobe hogs the file).<https://www.sumatrapdfreader.org/free-pdf-reader>

1.1 Compiling with VSCode

Open VSCode and the `settings.json` file. Add the following code. If the outer-most brackets aren't there, copy this verbatim. If there are brackets, skip the outermost brackets and place the code inside.

```
1
2 {
3     "latex-workshop.latex.recipes": [
4         {
5             "name": "compile lualatex",
6             "tools": [
7                 "mylualatex",
8             ]
9         },
10        {
11            "name": "compile bib gloss",
12            "tools": [
13                "mybiber", "myglossary",
14            ]
15        },
16    ],
17    "latex-workshop.latex.tools": [
18        {
19            "name": "mylualatex",
20            "command": "lualatex",
21            "args": [
22                "-synctex=1",
23                "-interaction=nonstopmode",
24                "-file-line-error",
25                "-output-format=-pdf",
26                "-output-directory=%DIR%/out",
27                "%DOCFILE%"
28            ]
29        },
30        {
31            "name": "mybiber",
32            "command": "biber",
33            "args": [
34                "main",
35                "--output-directory", "out",
36            ]
37        },
38        {
39            "name": "myglossary",
40            "command": "makeglossaries",
41            "args": [
42
```

```
43         "-d", "out",
44         "main"
45     ],
46 },
47 ]
48
49 }
```

2 Introduction

This class is based off the `scrartcl` class in the KOMA-Script family. Don't let the name fool you—although plain and unassuming with a (dare I say) Microsoft Word-like appearance, this template has numerous bells and whistles that make your \LaTeX ing easier. It could easily lend itself well to school assignments or lab reports as well.

This document is intended to be a guide on how to use it as well as offer some tips and hacks for producing a good doc.

3 Customizing your Doc

3.1 Class Options

- memo use a memo format instead.
- compact use a compact format (sections not on a new page, and different title page.)
- serif change the font to serif (kpfonts light instead of CM-Bright).

3.2 Tweaking Switches

```
1  %%% Draft toggles
2  \DarkModePDF %< if you want a dark theme
3  \DraftMark %< puts a draft water mark
4  \PreLimMark %< auto set
5  \ShowGrid
6
7
8  %%% some formatting toggles
9  \togglefalse{SecOnNewPage} % insert new page before each ↔
    section?
10 \secwiselabelnums % if you want figures and table numbers to be ↔
    based on section, ie 1.1, 1.2, etc.
11
12
13 \TocCecskip=0.7em % if you want to spread or compress ToC to ↔
    fit page better
14 \ToCextrabottomroom=2em % enlarges ToC page to help cram stuff
15 \ToCrightmargin=0pt % pushes page numbers closer to ToC for ↔
    easier reading
16 \pullToCcloser=-12pt % pulls ToC closer to section heading for ↔
    more room
17
18 \toggletrue{showListOfFigsTabs} %< show figs/tables contents
19 \togglefalse{samepgListOfFigsTabs} %< on the same page?
```

3.3 Document Data

The title of this document is redefined, and uses the KOMA commands:

```
\title{}  
\subtitle{}  
\author{}  
\date{}  
\company{} (equivalent to publishers)  
\logo{} (give the path to graphics). Can use the * variant if you want to manually  
include \includegraphics  
\logoset (some logo settings)
```

If you want to print the title (and have deliberate line breaks removed), or author, etc., try `\thetitle` -> “a template for a rather corp orate bore ing re port” and `\theauthor` -> “Kale Ewasiuk kalekje@gmail.com and Another Example”

3.4 Header and Footer

Since this document class uses KOMA Script, change the header with `\lohead{}`, `\rohead{}`

3.5 PDF metadata and PDF-A Compliance

This class tries to be PDF-A compliant. It uses the pdfx class to write document metadata (pdf properties). Most of the titling commands will clean and store the pdf data, but to write it, use `\writePDFmetadata` (see penlight documentation for details) before the document.

4 Sections

This class by default will insert a page break on a new section. Using the etoolbox package, you can disable this behaviour with `\togglefalse{SecOnNewPage}`. if you want to invert the behaviour for a particular section, use `!`

For paragraphs, if you would like the text to appear on a new line (rather than run in), use `!`.

```
1 use [short title for ToC]{Section title}
2     * will suppress number and ToC listing
3 \section{}
4 \subsection
5 \subsubsection
6 \paragraph
7 Custom
8 \section! will not necessarily put the section on a new page. By↵
   default, sections go on a new page
9 \paragraph! Will push the following text on a new line. ↵
   Without "!", the text begins on the same line as the heading
10 On any of the section/sub commands, using a + will add a letter ↵
   after it.
11
12 \sectionM{} is a front/back-matter section--will make a section ↵
   that shows up in ToC and PDF bookmarks, but no number
```

The sections are redefined so that `+` will append a letter. `\reset[sub]sectionletter`

| | |
|--------------------------------------|---------------------------|
| 1 \subsection{sub} | 4.1 sub |
| 2 \subsection+{sub plus} | 4.2a sub plus |
| 3 \subsubsection{subsub} | 4.2a.1 subsub |
| 4 \subsubsection+{subsub plus} | 4.2a.2a subsub plus |
| 5 \subsection+{sub plus} | 4.2b sub plus |
| 6 \resetsubsectionletter | 4.3a reset, then sub plus |
| 7 \subsection+{reset, then sub plus} | |

Add a manual page break in ToC `\addtocontents{toc}{\protect\newpage}`

5 References and Citations

5.1 References

I use the facilities of the `cleveref` package, which automatically type Figure Table etc I like using `s. f. t. etc.` to label my things, it's easier to type than the typically recommended `sec: fig: tab:` Examples: `\cref{f.m602fT0V}` `\label{s.steadystate}`

5.2 Citations/Bibliography

The `.bib` files contain the reference information. Call the key with `\cite{key}`.

I have a command that prints the title then adds the reference (in italic): `\citeT{key}`.

If you want to use data from a `.bib` file, but not add it to the citation list, wrap the command like so `\begin{refsection}\fullcite{##1}\end{refsection}`

I like JabRef to help manage my `.bib` files <https://www.jabref.org/>

5.3 Acronyms

This class provides acronyms with `\ac`. It suppresses links to the Acronym entry (unlike `\gls{}` which links to the glossary), and instead tries to use tooltips over the acronyms that show the long-form. If you want to place something different in place of the tooltip text, set `\def\ackeyToolTipText{Text Shown On Tooltip For: ackey}`

6 Float commands

This package offers float commands for inserting tables and figures

```
1 \InsertTable[htbp]%
2 {you can \input here or type \begin{tabular}...}%
3 {Caption goes here: egManitoba interface transfers.}%
4 {\label{t.trans}}% label goes here
5 [optional]%Optional table footnotes here
6
7 \InsertFigure[htbp]%
8 {\includegraphics[options]{path/to/figure.pdf}}%
9 {A long run on caption that is needlessly long}%
10 {\label{f.1}}%
11
12 NOTE: you can put a * directly after
13 InsertTable or InsertFigure,
14 and it will make it a wide table/fig
15 that is flush left, no star will indent the float a bit
```

Some helpful commands.

```
1
2 \RotPDF*+{\include...}
3   * star will restore the pdf back to normal orientation
4   + will add a pagebreak before
5
6 \RotFloatPage{\Insert [H]...}
7   If you want a rotated float (figure or table) on its own page↔
8   , use this with the [H] float placement
9
10 \FloatNextPage{\Insert [H]...}
11   If you have a big float and you know it should be on its own ↔
12   page right after
13
14 \BoxSameSizeImg{0{t} 0{t} m m}
15   make a box the same size of an image
```

7 Tabular matter

This class uses the author's `lutabulartools` package, and the author highly suggests we follow the `booktabs` way of making tables (no vertical lines).

7.1 References

Tabular 101: <https://en.wikibooks.org/wiki/LaTeX/Tables>

How to make nice tables: <https://inf.ethz.ch/personal/markusp/teaching/guides/guide-tables.pdf>

7.2 Columns

| Column | Use |
|--------------|---|
| L,N,R{X.Y} | <code>siunitx</code> number column (where X.Y is number format) |
| X,Z,Y | <code>tabularx</code> column, X=justified, Z=ragged (usually preferred), or Y=centered |
| P,M,B {wid} | ragged instead of justified equiv to p,m,b |
| V, T {wid} | horizontally centered plus vertically centered (V) / top aligned (T) paragraph cell |
| ~ | inject default <code>tabcolsep</code> , equiv to <code>@{\hspace {\tabcolsep}}</code> |
| The defaults | |
| S | see <code>siunitx</code> doc |
| l,c,r | Left, center, right, fits to width |
| p,m,b {wid} | A top, middle, bottom aligned paragraph cell, allows <code>\newline</code> and <code>\n1</code> |

In a paragraph cell (ie p, P, X, Z, Y, you can specify line-breaks with `\newline` or a short version `\n1` (defined in this class))

Rules (lines)

| | | |
|---|--------------------------|----------------------------|
| 1 | <code>\toprule</code> | |
| 2 | <code>\midrule</code> | |
| 3 | <code>\bottomrule</code> | <code>\cmidrule(){}</code> |
| 4 | <code>\gmidrule</code> | custom light gray mid rule |

Footnotes

```
1 tnote{ltr}:  
2 tfnote{ltr}:  
3  
4 \reseturef or \resetatnotes - reset automatic lettering  
5 atnote{key}: automatic table note  
6 atfnote{key}: automatic table footnote
```

Note: if using a float, After endtabular%
Make sure a % and no new lines after, this improves

7.3 Hacks

I like exploiting \rlap for hanging characters, ex:

| | | | | | |
|---|--|----------|----------|----|------|
| <pre>1 \begin{tabular}{ll}\toprule 2 \MC{Voltage\rlap{,}\kV} & \MC{\leftrightarrow Current\rlap{,}\Amps} \leftrightarrow bottomrule 3 \end{tabular}</pre> | <table><tbody><tr><td>Voltage,</td><td>Current,</td></tr><tr><td>kV</td><td>Amps</td></tr></tbody></table> | Voltage, | Current, | kV | Amps |
| Voltage, | Current, | | | | |
| kV | Amps | | | | |

7.3.1 Spacing

Use the following commands outside the tabular environment. For different vertical spacing, use `\renewcommand{\arraystretch}{1.2}`.
For different spacing, `\setlength\tabcolsep{2ex}`

7.3.2 Columns

If you have a multicolumn (say by using `\MC`), and the multicolumn is wider than the combined width of your columns underneath and they were not fixed-width columns (p,P,m,M,b,B,T,V,X,Z,Y), if you want them to be the same width, just use one of the aforementioned fixed-width columns. You might need to tweak a bit though.

Out of convenience, I erase the padding on the ends of tabular, because I like the way it looks. To bring it back with the `~` column like `~l1lr~`. Here's an example:

```
1 \begin{tabular}{~ll~}\toprule
2 hello & world \\\
3 \bottomrule
4 \end{tabular}
5
6 \begin{tabular}{ll}\toprule
7 hello & world \\\
8 \bottomrule
9 \end{tabular}
```

| | |
|-------|-------|
| hello | world |
| hello | world |

Use @{} to remove space between columns, or @{'code'} to insert code between column !{code} adds code keeps the space though.

Use >{'code'} <{'code'} to sandwich a cell with code of your choice

Note: with the siunitx columns N, L, R type columns, need to surround text with {} (and text that may come after a number) to get alignment correct

7.4 Common Errors

Common Errors Extra \cr You have too many & or forgot to put a \\ to end your row
siunitx invalid input You probably forgot to wrap text wit {} (note that you should not wrap multicolumn with {})
tex capacity exceeded put {} after midrule ? \MC on a p{} column?

Misplaced noalign -if you use \midrule etc before the \\ you will get this error

Misplaced omit or span if you use a multicolumn or non-number column in an siunitx column and forget to wrap with {}

8 List commands

<https://texblog.org/2008/10/16/lists-enumerate-itemize-description-and-how-to-change-the>

```
1 \ContParaAfterList If you're showing a list (itemize) and want ↵  
    the list to be in the same paragraph as the next lines, use ↵  
    this command to fix the spacing  
2     Otherwise, it will assume a new paragraph follows the list ↵  
        and space will be larger  
3 Lists    \ begin{itemize/enumerate}[moresep] will give more room ↵  
        between items  
4        [twocol] will put them over two columns
```

Added an automatically punctuate list. This is particularly useful if you have a large list and aren't entirely sure of the order

- one;
- two;
- three; and
- four.

9 Utilities

in addition to etoolbox, we have `\invtoggle{}`, `\gettoggletstate`,
`\ifdefOR{d1}{d2}{t}{f}`, `\ifstringeqx{}{}{}{}`, `\DoIfnotEmpty{}{}{}`,
`\DoWithoutPrinting{}`, `\DontDo{}`,

Some other stuff:

`\makealph{num}` `\makeAlph{num}`

```
1 \hl{highlight text}
2 \todo{todo note in margin}
3 \todoL{todo note on a new line}
```

10 Hacks

With KOMA-Script, we can make margin wider or smaller:

```
\begin{addmargin}[left indentation]{indentation} ... \end{addmargin}
```

`` makes an invisible character of same size

`\llap{}`, `\rlap{}`, `\clap{}` allows text to have no width (ie overlaps), left, right or center aligned `\llap{}` useful for left hanging labels (section, fig, tables), but these in general are good for hacking tables to create an item of zero width which will not adjust column width. If you want to use these as the first thing in a paragraph, use `\Llap`, `\Rlap`, and `\Clap`, otherwise, you may get some unwanted space.

Horizontal spacing: I use `\,` to produce a thin space: good for initials, or units like `K.\,Ewasiuk, 177\,lbs`

`\enlargethispage` https://latexref.xyz/_005cenlargethispage.html

<https://tex.stackexchange.com/questions/74353/what-commands-are-there-for-horizontal-spacing>

If you need to add a forced page break, we have some options. These should be done at the very end of the report writing process though.

<https://tex.stackexchange.com/questions/9852/what-is-the-difference-between-page-break-and>

9855#9855 `pagebreak` – create a new page and fill the page

`newpage` – perform a new page and don't let the paragraphs spread

`clearpage` – perform new page but ensure all floats are inputted

11 Typography

```
1
2
3
4 Typing units like kV, MW
5     Use a backslash in front. I define units using the siunitx ↵
        package
6     \kV \MW
7     This produces a smaller space and keeps the units together
```

11.0.1 Know your dashes

```
1 - is a hyphen: old-timers\\
2 -- is an en-dash and used for ranges ↵
   like: 0--60\\
3 --- is an em-dash: Kale---the cool ↵
   guy---said that
4     em-dashes are cool!
```

- is a hyphen: old-timers
– is an en-dash and used for ranges like: 0–60
— is an em-dash: Kale—the cool guy—said that
em-dashes are cool!

11.0.2 Know how spaces, new lines, and comments work in LaTeX

```
1 This will all
2 be one sentence.
3
4 \ \ \ \ New paragraph from blank line↵
   .
5 Supercali%<<see percent/comment
6 fragilstitic%<<<
7 expilaidocuious % << no space
8
9 \ \ \ \ It is useful to break ideas
10 into separate lines.
11 And makes it easy to
12 move lines around
13 if you change you mind, or
14 parse out lists like
15 cat,
16 dog, and
17 fish.
```

This will all be one sentence.

New paragraph from blank line. Supercalifrag-
ilstiticexpilaidocuious

It is useful to break ideas into separate lines. And
makes it easy to move lines around if you change
you mind, or parse out lists like cat, dog, and fish.

12 Packages

Here are some packages which I think the documentation is worth reading.

V links V

`xparse` The smart way to define commands and environments.

`etoolbox` Useful “scripting” tools like toggles, if-else, and hook into commands and environments.

`booktabs` Better rules(lines) for tables

`lutabulartools` Provides `\MC` and enhances `booktabs`.

You may want to see `makecell` and `multirow` as well.

`tabularx` The `tabularx` environment.

`longtable` table that can extend past one page

`ltxtable` Long `tabularx`

`siunitx` Units and numbers in text and tables.

`enumitem` Fancy lists and key-val options.

`autopuncitems` Automatically punctuate lists

`floatrow` Used to help with the `InsertTable/Figure`.

`caption` Tweak captions.

`graphicx` enhanced `includegraphics`

`cleveref` Allows `cref` and customization of captions

`relsize` Provides relative sizing commands like `\smaller`.

`KOMA-Script` You shouldn't have to mess around with this, but if you wanna tweak the class go for it.

`yamllvars` Make definitions with `yaml`. Used for report variables

`LuaTeX` The reference manual.

13 Hydro Stuff

Note: the settings of section 4 do not apply to Hydro reports.

13.1 Report Variables

This package can use YAMLvars.

13.2 Interconnection Study Macros

```
1 Hydro Report Macros R:\TariffStudies\MH-Report-Template\_↵
   boilerplate\HydroMacros.sty
2
3 \Study Produces ies, ifs, sis, fs (or group in front) and ↵
   enters glossary item
4 \aStudy an ies, a fs, etc. does this correctly
5 \Agreement Same as above but with agreement
6 \GenStation Types out the generating station
7 \Request Puts IR or TSR
8 \Firm Puts NRIS if it's a generator study, DNR if it's a ↵
   tariff study
9 \SecS Puts NRIS if it's a generator study, DNR if it's a ↵
   tariff study
10 \ifIFS{x}[y] Types x if study type is ifs, otherwise types y ↵
   (optional)
11 \ifGroupStudy
12 \ifTariffStudy
13 \PSSE \Mhtrans (mh transmission system)
14 \Customer IC for oait, EC for oatt
15 \IntUpgrades isus and toids
16
17
18
19
20
21 When typing acronyms Excel spreadsheet is used to manage ↵
   acronyms
22 Best to use \gls{oait}
23 For example. This will ensure Open Access Interconnection ↵
   Tariff is only typed the first time
```

End of document.