ij ţs

a template for a rather corporate boreing report

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

Some Department
A University

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Another Example
Third Contributer

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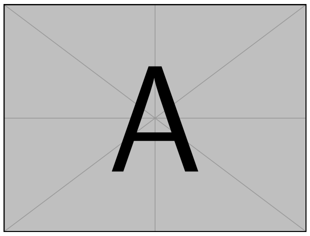

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0.1 Quick Start

- 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, PyCharn, VScode, notepad). To compile a LaTeX document, you simle 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 you 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 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
```

Biblography: `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`

0.1.1 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.

```

{
    "latex-workshop.latex.recipes": [
        {
            "name": "compile lualatex",
            "tools": [
                "mylualatex",
            ]
        },
        {
            "name": "compile bib gloss",
            "tools": [
                "mybiber", "myglossary",
            ]
        },

    ],
    "latex-workshop.latex.tools": [
        {
            "name": "mylualatex",
            "command": "lualatex",
            "args": [
                "-synctex=1",
                "-interaction=nonstopmode",
                "-file-line-error",
                "-output-format=-pdf",
                "-output-directory=%DIR%/out",
                "%DOCFILE%"
            ]
        },
        {
            "name": "mybiber",
            "command": "biber",
            "args": [
                "main",
                "--output-directory", "out",
            ]
        },
        {
            "name": "myglossary",
            "command": "makeglossaries",
            "args": [
                "-d", "out",
                "main"
            ]
        },
    ]

}
```

0.2 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 LaTeXing 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.

0.3 Customizing your Doc

0.3.1 !

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).

0.3.2 Tweaking Switches

```
%%% Draft toggles
\DarkModePDF %< if you want a dark theme
\DraftMark %< puts a draft water mark
\PreLimMark %< auto set
\ShowGrid


%%% some formatting toggles
\togglefalse{SecOnNewPage}  % insert new page before each ↩
   section?
\secwiselabelnums % if you want figures and table numbers to be ↩
   based on section, ie 1.1, 1.2, etc.


```

```
\TocCecskip=0.7em  % if you want to spread or compress ToC to fit page better
\ToCextrabottomroom=2em % enlarges ToC page to help cram stuff
\ToCrightmargin=0pt % pushes page numbers closer to ToC for easier reading
\pullToCcloser=-12pt % pulls ToC closer to section heading for more room

\floatlefthanglabel % hanging float labels and float flushed left.. experimental..

\noSectionNumbers % completely disable section numbers (possibly for a memo)


\toggletrue{showListOfFigsTabs} %< show figs/tables contents
\togglefalse{samepgListOfFigsTabs} %< on the same page?
```

0.3.3 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 , Another Example, and Third Contributer”

This class offers a way to print authors in a comma list \theauthors -> Kale Ewasiuk kalekje@gmail.com, Another Example, and Third Contributer
or individually \theauthors[1] -> Kale Ewasiuk kalekje@gmail.com, \theauthors[2] -> Another Example

- Kale Ewasiuk kalekje@gmail.com
- Another Example
- Third Contributer

0.3.4 Header and Footer

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

0.3.5 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.

0.4 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 !.

```
use [short title for ToC]{Section title}
        * will suppress number and ToC listing
\section{}
\subsection
\subsubsection
\paragraph
Custom
\section! will not necessarily put the section on a new page. By default, sections go on a new page
\paragraph!   Will push the following text on a new line. Without "!", the text begins on the same line as the heading
On any of the section/sub commands, using a + will add a letter after it.

\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`

```
\subsection{sub}
\subsection+{sub plus}
  \subsubsection{subsub}
  \subsubsection+{subsub plus}
\subsection+{sub plus}
\resetsubsectionletter
\subsection+{reset, then sub plus}
```

0.4.1 sub

0.4.2 +
sub plus

subsub

+
subsub plus

0.4.3 +
sub plus

0.4.4 +
reset, then sub plus

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

0.5 References and Citations

0.5.1 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.m602fTOV}` `\label{s.steadystate}`

0.5.2 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, wrape the command like so `\begin{refsection}\fullcite{##1}\end{refsection}`

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

0.5.3 Acronyms

This class provides acronyms with \ac. It supresses 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}

0.6 Float commands

This package offers float commands for inserting tables and figures

```
\InsertTable[htbp]%
{you can \input here or type \begin{tabular}...}%
+{Caption goes here: egManitoba interface transfers.}%
{\label{t.trans}}% label goes here
[optional]%Optional table footnotes here

\InsertFigure[htbp]%
{\includegraphics[options]{path/to/figure.pdf}}%
+{A long run on caption that is needlessly long}%
{\label{f.1}}%

NOTE: you can put a *  directly after
InsertTable or InsertFigure,
and it will make it a wide table/fig
that is flush left, no star will indent the float a bit

Put a + before the caption to justify it
```

Some helpful commands.

```

\RotPDF*+{\include...}
    * star will restore the pdf back to normal orientation
    + will add a pagebreak before

\RotFloatPage{\Insert [H]...}
   If you want a rotated float (figure or table) on its own page↩
      , use this with the [H] float placement

\FloatNextPage{\Insert [H]...}
  If you have a big float and you know it should be on its own ↩
     page right after

```

```
\BoxSameSizeImg{O{t} O{t} m m}
  make a box the same size of an image
```

0.7 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).

0.7.1 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`

0.7.2 Columns

Column	Use
L,N,R{X.Y}	`siunitx` number column (where X.Y is number format)
X,Z,Y	tabularx 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 tablcolsep, equiv to `@{\hspace {\tabcolsep }}`
The defaults	
S	see siunitx doc
l,c,r	Left, center, right, fits to width
p,m,b {wid}	A top, middle, bottom aligned paragraph cell, allows `\newline and \nl`

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

Rules (lines)

```
\toprule
\midrule
\bottomrule     \cmidrule(){}
```

```
\gmidrule        custom light gray mid rule
```

Footnotes

```
tnote{ltr}:
tfnote{ltr}:

\reseturef or \resetatnotes - reset automatic lettering
atnote{key}: automatic table note
atfnote{key}: automatic table footnote
```

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

0.7.3 Hacks

I like exploiting `\rlap` for hanging characters, ex:

```
\begin{tabular}{ll}\toprule
\MC{Voltage\rlap{,}\\kV} & \MC{↩
   Current\rlap{,}\\Amps} \\\↩
   bottomrule
\end{tabular}
```

Voltage, kV	Current, Amps

Spacing

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

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 `~lllr~`. Here's an example:

```
\begin{tabular}{~ll~}\toprule
hello & world \\
\bottomrule
\end{tabular}

\begin{tabular}{ll}\toprule
hello & world \\
\bottomrule
\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

0.7.4 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 exeeded 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 {}

0.8 List commands

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

```
\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
 Otherwise, it will assume a new pagagraph follows the list and space will be larger
Lists   \ begin{itemize/enumerate}[moresep] will give more room between items
 [twocol] will put them over two columns
```

Added an autoamtically 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.

0.9 Utilities

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

Some other stuff:

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

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

0.10 Symbols

if you `\toggletrue{dollarsignafter}` 2 M $

0.11 Hacks

With KOMA-Script, we can make margin wider or smaller:
`\begin{addmargin}[left indentation]{indentation} ... \end{addmargin}`

`\phantom{xx}` 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-spa

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-a
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

0.12 Typography

```



Typing units like kV, MW
    Use a backslash in front. I define units using the siunitx package
    \kV  \MW
    This produces a smaller space and keeps the units together
```

Know your dashes

```
- 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!
```

- 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!

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

```
This will all
be one sentence.

\ \ \ \ New paragraph from blank line.
Supercali%<<see percent/comment
fragilstitic%<<<
expilaidocuious  % << no space

\ \ \ \ 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.
```

This will all be one sentence.

New paragraph from blank line. Supercalifragilstiticexpilaidocuious

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.

0.13 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 coustomization 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.

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

`LuaTeX` The reference manual.

0.14 Math with LaTeX

Math on "pure" numbers:

`\fpeval` `\fpeval{1+2.5}`->3.5 (floating point math)
`\inteval` `\inteval{5/2}`->3 (division is rounded)

For a list of functions, see `https://ctan.math.washington.edu/tex-archive/macros/latex/contrib/l3packages/xfp.pdf`

Math on dimensions/lengths:

`\dimeval` `\rule{\dimeval{1cm+1cm}}{1pt}`->
`\skipeval` `a\hspace{\skipeval{1cm plus 1cm - (1cm plus 0.5cm)}}b`->ab

a
a

Note: if above does not work, you can try the old way:
`\rule{\dimexpr(\linewidth-3in)\relax}{1pt}`
or use `\gluexpr()\relax` in place of `\skipeval`

Note: glue/skip is stretchy, it has an X plus P minus M where it can stretch and shrink. `https://tex.stackexchange.com/questions/64756/what-is-glue-stretching` `https://tex.stackexchange.com/questions/64756/what-is-glue-stretching`

0.15 Hydro Stuff

Note: the settings of section 0.4 do not apply to Hydro reports.

0.15.1 Report Variables

This package can use YAMLvars.

0.15.2 Interconnection Study Macros

```
Hydro Report Macros R:\TariffStudies\MH-Report-Template\_boilerplate\HydroMacros.sty

\Study  Produces ies, ifs, sis, fs (or group in front) and enters glossary item
\aStudy an ies, a fs, etc. does this correctly
\Agreement  Same as above but with agreement
\GenStation Types out the generating station
\Request    Puts IR or TSR
\Firm   Puts NRIS if it's a generator study, DNR if it's a tariff study
\SecS   Puts NRIS if it's a generator study, DNR if it's a tariff study
\ifIFS{x}[y]    Types x if study type is ifs, otherwise types y (optional)
\ifGroupStudy
\ifTariffStudy
\PSSE   \Mhtrans (mh transmission system)
\Customer   IC for oait, EC for oatt
\IntUpgrades    isus and toids





When typing acronyms    Excel spreadsheet is used to manage acronyms
    Best to use \gls{oait}
    For example. This will ensure Open Access Interconnection Tariff is only typed the first time
```

End of document.