Introductory Workshop to LaTeX

Exercise Worksheet
http://liantze.googlepages.com/MMULaTeXworkshop2010

Lim Lian Tze ✉ liantze@gmail.com

8 March, 2010

1 Hello World: First LaTeX Document

1. Launch the TeXworks editor via Windows Start › All Programs › MiKTeX 2.8 › TeXworks.
2. Create a simple LaTeX file with the following contents.

```
1  % HelloWorld.tex — my first LaTeX document
2  \documentclass[11pt,a4paper]{article}
3
4  \begin{document}
5  Hello World!
6  \end{document}
```

3. Create a new directory in your thumb drive (or anywhere). Save the file as HelloWorld.tex in this directory.
4. Typeset the file via Typeset › Typeset or ⌈Ctrl⌉ + ⌈T⌉ .
5. If MiKTeX has been successfully set up and there is no error in HelloWorld.tex, the typeset result HelloWorld.pdf will be displayed in a separate window.

2 Text Formatting

1. Modify HelloWorld.tex as follows.
   (If it helps, you can display the line numbers in TeXworks by Format › Line Numbers.)

2. Save and typeset the file.

```
1   % HelloWorld.tex — my first LaTeX document
2   \documentclass[11pt,a4paper]{article}
3
4   \author{Your Name}
5   \title{My Wonderful Paper}
6
7   \begin{document}
8   \maketitle
9
10  \begin{abstract}
11  These are some simple demonstrations of \LaTeX{} features.
12  \end{abstract}
```

```
13
14  \section{Introduction}\label{sec:intro}
15  Hello World!
16  This is not a new line nor a new paragraph.
17
18  This is a new paragraph.
19
20  \section{Formatting}\label{sec:formatting}
21
22  \begin{itemize}
23  \item Font styles:
24          \begin{enumerate}
25          \item \textbf{bold}
26          \item \emph{italic}
27          \item \underline{underlined}\footnote{but considered bad taste}
28          \end{enumerate}
29  \item Font families: \textrm{roman or serif}, \textsf{sans serif}, \texttt{teletype}
30  \item Font sizes: {\large large} text, {\small small} text, etc.
31  \item \verb|verbatim_text like this| vs verbatim\_text like this
32  \item R{\'e}sum{\'e}, ch{\^a}teau, El Ni{\~n}o
33  \end{itemize}
34  \end{document}
```

3. Comment out the item about font sizes by adding a % at the start of line 30:

```
30  %\item Font sizes: …
```

Save the file and typeset it. You can thus delete certain texts from your paper, but will be able to restore it quickly if you change your mind later on.

3 Sectioning and Cross-Referencing

1. Add a table of contents, and new subsection (starting on line 34). Typeset the file.
   If you are using an older version of TeXworks, you might need **two** runs to get the cross-referencing and table of contents right.

```
7   …
8   \maketitle
9   \tableofcontents          ◁─ Add this command to get ToC
```

```
33  …
34  \end{itemize}
35
36  \subsection{This is a Subsection}\label{sec:subtest}      ◁─ Labels are like 'booksmarks'.
37
38  Blah blah.
39
40  Start a new paragraph as shown in section \ref{sec:intro}. The current subsection is
    numbered \ref{sec:subtest} and we are now on page \pageref{sec:subtest}.
41
42  \end{document}
```

2. Click in TeXwork's source window, then Window ▸ Show ▸ Tags. You can now navigate your source file!

3. ⌈Ctrl⌉ -click anywhere in your source code. TeXworks will jump to the corresponding point in the PDF preview window.
   Now try the same trick by ⌈Ctrl⌉ -clicking anywhere in the preview window.

4. Now add a new subsection *before* the subsection labelled sec:subtest.

```
36  \subsection{New Subsection}\label{sec:new}
37  Hi!
38
39  \subsection{This is a Subsection}\label{sec:subtest}
40  …
```

Notice how the table of contents and cross-references are automatically updated after typesetting. You won't have to maintain them manually!

4 Mathematics

1. Import the amsmath package in the preamble.

```
1  \documentclass[11pt,a4paper]{article}
2  \usepackage{amsmath}        ◁ Provides many commands useful for typesetting maths
3  …
```

2. Add a new section.

```
45  …
46  \section{Some Maths}
47
48  \eqref{eq:golden:fib} relates the golden ratio and the Fibonacci series. Recall that the
    golden ratio, $\phi = \frac{1}{2} (1 + \sqrt{5})$.
49
50  \begin{equation}\label{eq:golden:fib}
51  \phi = 1 +
52        \sum^{\infty} _{n=1}
53        \frac{ (-1)^{n+1} }{ F_n F_{n+1} }
54  \end{equation}
```

5 Figures and Tables

1. Get a graphics file from the Internet, anywhere. It must be a .jpg, .png or .pdf. (I'm using logoMMU.png.)
   Put it in the same directory as your HelloWorld.tex.

2. Insert a figure and a table as follows:

```
4  \usepackage{graphicx}        ◁ Needed for including graphics files
```

```
56  …
57  \section{Figures and Tables}
58
59  \begin{figure}[hbt!]
60  \centering
61  \includegraphics[width=5cm]{logoMMU}          ◁ No need to include file extension
62  \caption{MMU Logo}\label{fig:mmu:logo}
63  \end{figure}
64
65  Figure \ref{fig:mmu:logo} depicts MMU's logo.
66
67  \begin{table}[hbt!]\centering
68  \caption{Sample table}\label{tab:sample}
69  \begin{tabular}{| l | c || r |}
70  \hline
71  one & two two & three three tree \\ \hline
72  one one & two two two & three \\ \hline
73  \end{tabular}
74  \end{table}
75
76  Table \ref{tab:sample} is a very simple example.
```

6 Citations and References

1. Launch JabRef via Windows Start › All Programs › JabRef › JabRef 2.5.

2. Create a new bibliography database: File › New database.

3. Add a new bibliography entry by clicking the green **✚** button on the toolbar. Create an Article entry.

4. Enter the following fields:

```
Author    : Donald E. Knuth
Title     : Literate programming
Journal   : The Computer Journal
Year      : 1984
Volume    : 27
Pages     : 97–111
Bibtexkey : knuth:1984        ◁ This will be the citation key

(In the Optional fields panel:)
Number  : 2
Address : Oxford, UK
Publisher : Oxford University Press
```

5. Now add another Inproceedings entry with the following fields:

```
Author   : Me Good
Title    : A Great Paper on a Great Research
Booktitle : Proceedings of the First Postgraduate Conference
```

```
Year      : 2010
Bibtexkey : good:2010

(In the Optional fields panel:)
Pages     : 1–8
Address   : Kuala Lumpur, Malaysia
```

6. Save the bibliography database as `mybib.bib` in the same directory as `HelloWorld.tex`.

7. Back in `HelloWorld.tex`... make the following changes:

```
8    ...
9    \bibliographystyle{plain}        ──<  This specifies the citation & bibliography style
10   \begin{document}
11   ...
```

```
78   ...
79   \section{Testing Citations}
80
81   Donald Knuth pioneered literate programming \cite{knuth:1984}. And please read my
     wonderful paper \cite{good:2010}.
82
83   \bibliography{mybib}        ──<  Path name of bibliography file; no file extension
```

8. Typeset. The citations and references will be automatically formatted and generated.

9. If you want to change the bibliography style, you'll need to manually delete `HelloWorld.bbl` first. (Do try it. The freedom from manually formatting all the references and citations is liberating.)

7 Using Journal- or Conference-provided Document Classes

7.1 The ACM Alternate Style

1. Despite its name, `sig-alternate.cls` seems to be the more popular choice among ACM-affiliated conferences because it produces 'tighter' output.

2. Unfortunately it's not included in MiKTeX, so you have to download it manually from `http://www.acm.org/sigs/publications/proceedings-templates` (Choose Option 2 on that webpage).

3. Put sig-alternate.cls in the same path as `HelloWorld.tex` file. [1]

4. Comment out `\documentclass[11pt,a4paper]{article}`.
   Add instead `\documentclass{sig-alternate}`. Don't specify the font size or paper size unless instructed by your conference organiser.

5. Change the `bibliographystyle` to `abbrv`. (Remember to manually delete `HelloWorld.bbl`.)

6. Remove (or comment out) the `\tableofcontents`.

7. Typeset and witness... magic (or what seems like it).

8. For other ACM-specific features (e.g. ACM keywords, author affiliations etc), learn-by-example from `sig-alternate.tex` and `sig-alternate.pdf`.

---

[1]There are other ways of manually adding/installing packages system-wide, but we won't discuss them today.

9. Refer to the list of ACM Computing Classification System Categories and General Terms at `http://www.acm.org/about/class/1998/`.

7.2 The IEEEtran Style

1. IEEEtran *is* included in MiKTeX, so if you don't have it on your system, it will be automatically downloaded and installed when you typeset your document.

2. Change your `documentclass` to `IEEEtran`.

3. Change your `bibliographystyle` to `IEEEtran`. (Remember to manually delete `HelloWorld.bbl`.)

4. Remove (or comment out) the `\tableofcontents`.

5. Typeset!

6. For more IEEEtran-specific features, refer to your journal publisher's instructions, or consult the documentation via `mthelp −view IEEEtran`.

8 Presentation Slides

1. Create a new document in TeXworks with the following contents.

```
1  \documentclass{beamer}
2
3  \author{Your Name}
4  \title{Quick Beamer Presentation}
5  \institute{Multimedia University, Malaysia}
6  \date{8 March 2010}
7  \begin{document}
8
9  \begin{frame}
10 \maketitle
11 \end{frame}
12
13 \begin{frame}
14 \frametitle{Agenda}
15 \tableofcontents
16 \end{frame}
17
18 \section{Introduction}
19 \subsection{Hello!}
20
21 \begin{frame}
22 \frametitle{Hello World!}
23 This is my first \LaTeX\ presentation with beamer.
24 \begin{itemize}
25 \item Beamer has many features
26 \item This is just a simple demo
27 \end{itemize}
28 \end{frame}
29
30 \subsection{Maths}
```

```
31
32  \begin{frame}
33  \frametitle{Maths work, too}
34  \begin{equation}
35  y = ax^2 + bx + c
36  \end{equation}
37
38  \begin{theorem}[Special Blocks]
39  Definitions, theorems, examples, \ldots
40  \end{theorem}
41  \end{frame}
42
43  \section{Conclusion}
44
45  \begin{frame}
46  \frametitle{It's Your Decision}
47  \begin{itemize}
48  \item Give \LaTeX\ a try
49  \item You might hate it, you might love it
50  \item Now that you've tried it, you can decide if it's for you
51  \end{itemize}
52  \end{frame}
53  \end{document}
```

2. Save it as HelloSlides.tex in a *new* directory, to keep things tidy.

3. Typeset it. beamer (and other required packages) will be automatically downloaded and installed if your system does not already have them.

4. Open HelloSlides.pdf in Acrobat Reader. Run the slide show by going into fullscreen mode (Ctrl + L), using the arrow keys to advance to previous/next slides. Exit the slide show by pressing the Esc key.

5. Close HelloSlides.pdf Acrobat Reader.
   Important Note: You *must* close a PDF file in Reader before typesetting the LaTeX file again; otherwise Reader will lock the PDF and you won't be able to typeset it successfully.

6. Add the following line after \documentclass{beamer} to use a theme:

```
2  \usepackage{CambridgeUS}
```

Try other themes, such as Singapore, Montpellier, Warsaw, Goettingen.

In Closing...

Thank you very much for your participation in this workshop! We would appreciate it very much if you could fill in and return the attached feedback questionnaire form.

All materials, including the workshop presentation slides, this worksheet and the exercise sample codes, are available for download at http://liantze.googlepages.com/MMULaTeXworkshop2010.

If you have any questions concerning LaTeX, feel welcome to e-mail me at liantze@gmail.com.

9 Useful Links

[1] *MiKTeX Download Page*. URL: http://miktex.org/2.8/setup.

[2] *MiKTeX FAQ*. URL: http://docs.miktex.org/faq/faq.html.

[3] Tobias Oetiker et al. *The Not So Short Introduction to LaTeX2e*. (Run mthelp --view lshort to access.) 2009.

[4] *LaTeX Wikibook* 👍. URL: http://en.wikibooks.org/wiki/LaTeX.

[5] *Getting to grips with LaTeX*. URL: http://www.andy-roberts.net/misc/latex/.

[6] *Malaysian LaTeX Users Group Blog*. (I'm one of the authors.) URL: http://latex-my.blogspot.com/.

[7] *LaTeX: Beautiful Typesetting*. (My own page on LaTeX; all the materials today can be downloaded here.) URL: http://liantze.googlepages.com/latextypesetting.

[8] *The TeX Users Group web site*. URL: http://www.tug.org/.

[9] *The Comprehensive TeX Archive Network*. URL: http://www.ctan.org/.