

Quick start for LaTeXing with IEEEtran.cls for IEEE Computer Society Conferences

First Author, Second Author
University of Examples, Germany
{lastname}@example.org

Third Author
School of Electrical and
Computer Examples
Georgia Institute of Examples
Atlanta, Georgia 30332-0250
<http://www.example.org>


Abstract—Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

I. INTRODUCTION

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.


Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed

diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate  etus eu enim. Vestibulum pellentesque felis eu massa.

The remainder of the paper starts with a presentation of related work (Section II). It is followed by a presentation of hints on \LaTeX (??). Finally, a conclusion is drawn and outlook on future work is made (Section IV).

II. RELATED WORK

Winery [1] is a graphical  modeling tool. The whole idea of TOSCA is explained by Binz et al. [2].

III. LATEX HINTS

This section contains hints on writing LaTeX. It focuses on minimal examples, which can be directly adapted to the content

A. Handling of paragraphs

One sentence per line. This rule is important for the usage of version control systems. A new line is generated with a blank line. As you would do in Word: New paragraphs are generated by pressing enter. In LaTeX, this does not lead to a new paragraph as LaTeX joins subsequent lines. In case you want a new paragraph, just press enter twice (!). This leads to an empty line. In word, there is the functionality to press shift and enter. This leads to a hard line break. The text starts at the beginning of a new line. In LaTeX, you can do that by using two backslashes (\backslash).

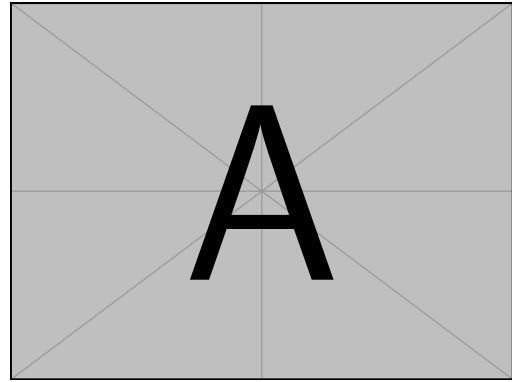
This is rarely used.

Please do *not* use two backslashes for new paragraphs. For instance, this sentence belongs to the same paragraph, whereas the last one started a new one. A long motivation for that is provided at <http://loopspace.mathforge.org/HowDidIDoThat/TeX/VCS/#section.3>.

```

369 One sentence per line.
370 This rule is important for the usage of version control
    ↳ systems.
371 A new line is generated with a blank line.
372 As you would do in Word:
373 New paragraphs are generated by pressing enter.
374 In LaTeX, this does not lead to a new paragraph as LaTeX joins
    ↳ subsequent lines.
375 In case you want a new paragraph, just press enter twice (!).
376 This leads to an empty line.
377 In word, there is the functionality to press shift and enter.
378 This leads to a hard line break.
379 The text starts at the beginning of a new line.
380 In LaTeX, you can do that by using two backslashes
    ↳ (\textbackslash\textbackslash).
381 This is rarely used.
382
383 Please do \textit{not} use two backslashes for new paragraphs.
384 For instance, this sentence belongs to the same paragraph,
    ↳ whereas the last one started a new one.
385 A long motivation for that is provided at
    ↳ \url{http://loopspace.mathforge.org/HowDidIDoThat/TeX/VCS/#section.3}

```



Corresponding L^AT_EX code of
paper-conference-minted.tex

```

407 Numbers can be written in plain text (such as 100), by using the
    ↪ siunitx package like that:
408 \SI{100}{\km\per\hour},
    or by using plain \LaTeX{} (and math mode):
409 $100 \frac{\mathrm{km}}{\mathrm{h}}$.
410

```

L^AT_EX automatically hyphenates words. When using microtype, there should be less hyphenations than in other settings. It might be necessary to tweak the hyphenations nevertheless. Here are some hints:

In case you write “application-specific”, then the word will only be hyphenated at the dash. You can also write `applica\allowbreak{}tion-specific` (result: application-specific), but this is much more effort.

You can now write words containing hyphens which are hyphenated at other places in the word. For instance, `application="specific` gets `application-specific`. This is enabled by an additional configuration of the babel package.

```

396 In case you write \enquote{application-specific}, then the
    ↪ word will only be hyphenated at the dash.
397 You can also write \verblappla\allowbreak{tion-specific}
    ↪ (result: applica\allowbreak{tion-specific}), but this is
    ↪ much more effort.
398
399 You can now write words containing hyphens which are
    ↪ hyphenated at other places in the word.
400 For instance, \verblapapplication="specific1 gets
    ↪ application="specific.
401 This is enabled by an additional configuration of the babel
    ↪ package.

```

Numbers can written plain text (such as 100), by using the siunitx package like that: $100 \frac{\text{km}}{\text{h}}$, or by using plain L^AT_EX (and math mode): $100 \frac{km}{h}$.

Corresponding	L ^A T _E X	code	of
paper-conference-minted.tex			

414 \SI{5}{\percent} of \SI{10}{kg}

Corresponding \LaTeX code of
paper-conference-minted.tex

418 Numbers are automatically grouped: `\num{123456}`.

Please use the “enquote command” to quote something.
Quoting with “quote” or “quote” also works.

```
424 Please use the \enquote{enquote command} to quote something.
425 Quoting with ``quote'' or ``quote'' also works.
426
```

Cleveref demonstration: Cref at beginning of sentence, cref in all other cases.

Figure 1 shows a simple fact, although Figure 1 could also show something else.

Figure 2 shows a simple fact, although Figure 2 could also show something else.

Section III-E shows a simple fact, although Section III-E could also show something else.

Heading1	Heading2
One	Two
Thee	Four

Figure 2: Example table for cref demo



Figure 3: Simple Figure. Based on Scharrer [3].

Corresponding \LaTeX code of
paper-conference-minted.tex

```

455 \Cref{fig:ex:cref} shows a simple fact, although
    ↳ \cref{fig:ex:cref} could also show something else.
456
457 \Cref{tab:ex:cref} shows a simple fact, although
    ↳ \cref{tab:ex:cref} could also show something else.
458
459 \Cref{sec:ex:cref} shows a simple fact, although
    ↳ \cref{sec:ex:cref} could also show something else.

```

F. Figures

Figure 3 shows something interesting.

Corresponding \LaTeX code of
paper-conference-minted.tex

```

464 \Cref{fig:label} shows something interesting.
465
466 \begin{figure}
467   \centering
468   \includegraphics[width=.8\linewidth]{example-image-golden}
469   \caption[Simple Figure]{Simple Figure. Based on
    ↳ \citet{mwe}.}
470   \label{fig:label}
471 \end{figure}

```

One can span a figure across multiple columns by using `\begin{figure*}`. See Figure 4 as an example.

Corresponding \LaTeX code of
paper-conference-minted.tex

```

479 \begin{figure*}
480   \centering
481   % note that \textwidth is used instead of \linewidth
482   % This ensures that the graphics width is 60% of the "page"
    ↳ (text block), and not just 60% of the current text
    ↳ column
483   % See https://tex.stackexchange.com/a/17085/9075 for details
484   \includegraphics[width=.6\textwidth]{example-image-16x9}
485   \caption{16x9 Figure}
486   \label{fig:16x9}
487 \end{figure*}

```

G. Sub Figures

An example of two sub figures is shown in Figure 5.

Corresponding \LaTeX code of
paper-conference-minted.tex

```

496 \begin{figure*}[!b]
497   \centering
498   \subfloat[Case
    ↳ I]{\includegraphics[width=.4\linewidth]{example-image-a}%
499   \label{fig:first_case}}
500   \hfil
501   \subfloat[Case
    ↳ II]{\includegraphics[width=.4\linewidth]{example-image-b}%
502   \label{fig:second_case}}
503   \caption{Example figure with two sub figures.}
504   \label{fig:two_sub_figures}
505 \end{figure*}

```

Note that often IEEE papers with subfigures do not employ subfigure captions (using the optional argument to `\subfloat[]`), but instead will reference/describe all of them (a), (b), etc., within the main caption. Be aware that for `subfig.sty` to generate the (a), (b), etc., subfigure labels, the optional argument to `\subfloat` must be present. If a subcaption is not desired, just leave its contents blank, e.g., `\subfloat[]`. An example is shown in Figure 6.

Corresponding \LaTeX code of
paper-conference-minted.tex

```

518 \begin{figure*}[!b]
519   \centering
520
    ↳ \subfloat[]{\includegraphics[width=.4\linewidth]{example-image-a}%
521   \label{fig:first_case_ieee}}
522   \hfil
523
    ↳ \subfloat[]{\includegraphics[width=.4\linewidth]{example-image-b}%
524   \label{fig:second_case_ieee}}
525   \caption{Example figure with two sub figures. IEEE style.
    ↳ (a) The first case. (b) The second case.}
526   \label{fig:two_sub_figures_ieee}
527 \end{figure*}

```

H. Tables

Note that IEEE does not support `\begin{table}`, one has to use `\begin{figure}`.

(Original size: 320×180 bp)

16 × 9

(Original size: 320 × 180 bp)

```
535 \begin{figure}
536 \caption{Simple Table}
537 \label{tab:simple}
538 \centering
```

(a) Case I

```
551 % Source: https://tex.stackexchange.com/a/468994/9075
552 \begin{figure}
553 \caption{Table with diagonal line}
554 \label{tab:diag}
```

(b) Case II

Figure 6: Example figure with two sub figures. IEEE style. (a) The first case. (b) The second case.

Figure 7: Simple Table

Heading1	Heading2
One	Two
Thee	Four

Figure 8: Table with diagonal line

Diag Column Head I	Diag Column Head II	Second	Third
		foo	bar

I. Source Code

minted is a sophisticated packes to enable properly high-lighted listings. It uses the pygments library, which in turn requires Python.

Listing 1 shows source code written in XML. Zeile 2 contains a comment.

```

1 <listing name="example">
2   <!-- comment -->
3   <content>not interesting</content>
4 </listing>

```

List. 1: Example XML listing using minted

Corresponding	L ^A T _E X	code	of
paper-conference-minted.tex			
574	<code>\Cref{lst:XML}</code>	shows source code written in XML.	
575	<code>\refline{line:comment}</code>	contains a comment.	
576			
577	<code>\begin{listing}[htbp]</code>		
578	<code>\begin{minted}[linenos=true,escapeinside=]{xml}</code>		
579	<code><listing name="example"></code>		
580	<code><!-- comment --> </code>	<code>\labelline{line:comment} </code>	
581	<code><content>not interesting</content></code>		
582	<code></listing></code>		
583	<code>\end{minted}</code>		
584	<code>\caption{Example XML listing using minted}</code>		
585	<code>\label{lst:XML}</code>		
586	<code>\end{listing}</code>		

One can also typeset JSON as shown in Listing 2.

```

1 {
2   key: "value"
3 }

```

List. 2: Example JSON listing using minted

Corresponding	L ^A T _E X	code	of
paper-conference-minted.tex			
592	<code>\begin{listing}[htbp]</code>		
593	<code>\begin{minted}[linenos=true,escapeinside=]{json}</code>		
594	<code>{</code>		
595	<code>key: "value"</code>		
596	<code>}</code>		
597	<code>\end{minted}</code>		
598	<code>\caption{Example JSON listing using minted}</code>		
599	<code>\label{lst:flJSON}</code>		
600	<code>\end{listing}</code>		

Java is also possible as shown in ??.

```

1 public class Hello {
2     public static void main (String[] args) {
3         System.out.println("Hello World!");
4     }
5 }

```

List. 3: Java code rendered using minted

Corresponding	L ^A T _E X	code	of
paper-conference-minted.tex			
606	<code>\begin{listing}[htbp]</code>		
607	<code>\begin{minted}[linenos=true,escapeinside=]{java}</code>		
608	<code>public class Hello {</code>		
609	<code>public static void main (String[] args) {</code>		
610	<code>System.out.println("Hello World!");</code>		
611	<code>}</code>		
612	<code>}</code>		
613	<code>\end{minted}</code>		
614	<code>\caption{Java code rendered using minted}</code>		
615	<code>\label{lst:java}</code>		
616	<code>\end{listing}</code>		

J. Itemization

One can list items as follows:

- Item One
- Item Two

Corresponding	L ^A T _E X	code	of
paper-conference-minted.tex			
624	<code>\begin{itemize}</code>		
625	<code>\item Item One</code>		
626	<code>\item Item Two</code>		
627	<code>\end{itemize}</code>		

With the package paralist, one can create itemizations with lesser spacing:

- Item One
- Item Two

Corresponding	L ^A T _E X	code	of
paper-conference-minted.tex			
633	<code>\begin{compactitem}</code>		
634	<code>\item Item One</code>		
635	<code>\item Item Two</code>		
636	<code>\end{compactitem}</code>		

One can enumerate items as follows:

- 1) Item One
- 2) Item Two

Corresponding \LaTeX code of
paper-conference-minted.tex

```
642 \begin{enumerate}
643 \item Item One
644 \item Item Two
645 \end{enumerate}
```

With the package paralist, one can create enumerations with lesser spacing:

- 1) Item One
- 2) Item Two

Corresponding \LaTeX code of
paper-conference-minted.tex

```
651 \begin{compactenum}
652 \item Item One
653 \item Item Two
654 \end{compactenum}
```

With paralist, one can even have all items typset after each other and have them clean in the tex document:

- 1) All these items... 2) ...appear in one line 3) This is enabled by the paralist package.

Corresponding \LaTeX code of
paper-conference-minted.tex

```
660 \begin{inparaenum}
661 \item All these items...
662 \item ...appear in one line
663 \item This is enabled by the paralist package.
664 \end{inparaenum}
```

K. Other Features

The words “workflow” and “dwarflike” can be copied from the PDF and pasted to a text file.

Corresponding \LaTeX code of
paper-conference-minted.tex

```
670 The words \enquote{workflow} and \enquote{dwarflike} can be
    ↪ copied from the PDF and pasted to a text file.
```

The symbol for powerset is now correct: \wp and not a Weierstrass p (\wp).

$\wp(1, 2, 3)$

Corresponding \LaTeX code of
paper-conference-minted.tex

```
674 The symbol for powerset is now correct: $\powerset$ and not a
    ↪ Weierstrass p ($\wp$).
675
676 $\powerset(\{1,2,3\})$
```

Brackets work as designed: $\langle \text{test} \rangle$ One can also input backquotes in verbatim text: ``test``.

Corresponding \LaTeX code of
paper-conference-minted.tex

```
680 Brackets work as designed:
681 \langle test \rangle
682 One can also input backquotes in verbatim text: \verb|`test'|.
```

IV. CONCLUSION AND OUTLOOK

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

ACKNOWLEDGMENT

Identification of funding sources and other support, and thanks to individuals and groups that assisted in the research and the preparation of the work should be included in an acknowledgment section, which is placed just before the reference section in your document [4].

In the bibliography, use `\textsuperscript` for “st”, “nd”, ...: E.g., “The 2nd conference on examples”. When you use JabRef, you can use the clean up command to achieve that. See <https://help.jabref.org/en/CleanupEntries> for an overview of the cleanup functionality.

REFERENCES

- [1] O. Kopp *et al.*, “Winery – A Modeling Tool for TOSCA-based Cloud Applications,” in *Proceedings of 11th International Conference on Service-Oriented Computing (ICSOC’13)*, ser. LNCS, vol. 8274. Springer Berlin Heidelberg, 2013, pp. 700–704.
- [2] T. Binz, G. Breiter, F. Leymann, and T. Spatzier, “Portable Cloud Services Using TOSCA,” *IEEE Internet Computing*, vol. 16, no. 03, pp. 80–85, May 2012.
- [3] M. Scharrer, *The mwe Package*, 2017. [Online]. Available: <http://texdoc.net/mwe>

- [4] B. Veytsman, “ \LaTeX class for the association for computing machinery – acknowledgement information,” Aug. 2021. [Online]. Available: <https://github.com/borisveytsman/acmart/blob/1704c8bf7eee92a1515ff755f5118b6a22bb1f8e/samples/samples.dtx#L709>

All links were last followed on October 5, 2020.