

# An example L<sup>A</sup>T<sub>E</sub>X document

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## **Abstract**

This is a small and simple document written in L<sup>A</sup>T<sub>E</sub>X to show the capabilities and workings of the software package.

## **Contents**

**List of Figures**

**List of Tables**

# 1 The first section

This section is about the basic work with text in  $\text{\LaTeX}$ . It is a little different than one would think.

## 1.1 Where’s my line break?!

For instance, no matter how many spaces I add, it will not be visible in the document. Second, even if I add a line break, it is not respected! and if I add an empty line, it will not be an empty line, but simply a new paragraph!

This is different than you’re used to, but it means that a paragraph, which is a “structural unit of content” in your text, also will be clearly visible as a block of text in the source code, as can be seen by reading the source text itself.

This way, one is brought to think about paragraphs, chapters, sections, subsections etc. rather than headlines, bold or italic font, page breaks and whatnot. All this is automatically taken care of<sup>1</sup> by the typesetting engine.

## 1.2 Another subsection

As one can see by studying the source code, numbering of sections, subsections etc. is also taken care of automatically. Also, I can refer to a section (or other structural element) by a *label* rather than its number, for instance to section ???. Try to insert an extra subsection before it and see what happens!

## 1.3 A few more things

The idea of thinking structure and content rather than looks can go against some pretty set habits sometimes. Like the one of using *italics* to emphasise something in the text *when we want something to stand out*. The **emph** command does this intellegently, writes the word in italics if the rest of the text is upright and vice versa.

*The idea of thinking structure and content rather than looks can go against some pretty set habits sometimes. Like the one of using italics to emphasise something in the text when we want something to stand out. The emph command does this intellegently, writes the word in italics if the rest of the text is upright and vice versa.*

## 1.4 Lists

There are different kinds of lists: numbered, bullet- and descriptive lists, in the shape of the **itemize**, **enumerate** and **description** environments. Here’s how they work:

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<sup>1</sup>This also has the very nice side effect that footnotes, chapter numbering etc. is taken care of automatically - no sweat!

#### 1.4.1 The enumerate environment

1. Item 1
2. Item 2
3. (a) they can  
(b) also be  
(c) nested!
4. And so on.
5. ...

#### 1.4.2 The itemize environment

- Item 1
- Item 2
- 1. they can  
2. also be  
3. nested!
- And so on.
- ...

#### 1.4.3 The description environment

**First item** This environment is more suitable for longer pieces of text, as can be seen here where I fill in a lot of text just so you can see that it looks better with more text, not just a little text. Don't you think that looks better?

**Second Item** This environment is more suitable for longer pieces of text, as can be seen here where I fill in a lot of text just so you can see that it looks better with more text, not just a little text. Don't you think that looks better?

**Third item** This environment is more suitable for longer pieces of text, as can be seen here where I fill in a lot of text just so you can see that it looks better with more text, not just a little text. Don't you think that looks better?

**Third item** ..... and on and on.

## 2 Other elements: math, images, tables etc.

This section will show how to do fancy stuff like math, tables and figures with images in them.

### 2.1 Mathematical notation

The typesetting of mathematical expressions is where L<sup>A</sup>T<sub>E</sub>X really shines. Its text input “language” is logically built, and the output looks far better than almost any other program out there. Maths can be shown in three different ways: either inline in the text, in which case the math code is surrounded by `$(math expression here)$` in the source text. That way, a simple equation like e.g.  $\Delta E_{kin} = \frac{1}{2}m\Delta v^2$  can be easily integrated into the text.

Or it can be shown as a single equation for itself. This can be done either enclosed in double `$$`'s:

$$\Delta E_{kin} = \frac{1}{2}m\Delta v^2$$

or in the `equation` environment, in which case it will be automatically numbered:

$$\Delta E_{kin} = \frac{1}{2}m\Delta v^2 \tag{1}$$

Finally there's the case where we have several equations or a long derivation that we want lined up nicely with the = signs above each other. To this, we use the `align` environment:<sup>2</sup>

$$A = B \tag{2}$$

$$C = D \tag{3}$$

$$E \neq F = G \tag{4}$$

### 2.2 Floats: figures and tables

One thing that can be very confusing to a beginner is the way L<sup>A</sup>T<sub>E</sub>X handles figures and tables. They are treated as *floating objects*, which means that they do not appear in the text exactly where they are put by the author.

Rather, L<sup>A</sup>T<sub>E</sub>X tries to fit them in where they fit best in the document. This means that if you have many tables and figures, changing a few words can change the layout of the floats and hence the entire document significantly. This is on purpose and is meant to be that way.

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<sup>2</sup>There is also an `eqnarray` environment that does the same and that one will see in many manuals - it is an older environment and is considered obsolete in favor of `align`.

<b>My table</b>	Thing I	Thing II	Thing III
Param I	1.1	2.2	3.3
Param II	4.4	5.5	6.6
Param III	7.7	8.8	9.9

Table 1: This is a tabular inside a table. Tabular is to table more or less what image/graphics is to figure.

### 2.2.1 Figure

Here is how one can insert a figure (it is inserted here in the source text):



Figure 1: This is a very, very dangerous Tiger! It is also offensively bad photoshopping.

The figure is automatically numbered like anything else, and can be referred to if one remembered to give it a label. Try to remove the surrounding `figure` environment and maybe also the `center` environment and see what difference it makes.

### 2.2.2 Tables

Here is where the table is inserted in the source text:

## 3 Further reading

Needless to say, I have only just scratched the surface here.  $\text{\LaTeX}$  is a huge piece of software with a huge set of features and a mindbogglingly vast set of packages that can provide even more features. There is lots of literature about  $\text{\LaTeX}$ , I will recommend these two works as great for both the beginner and the more seasoned  $\text{\TeX}$ 'er.

1. The first one is “The not so short introduction to  $\text{\LaTeX}2_{\epsilon}$ ” Written by Tobias Oetiker. You can [download the PDF here](#). I recommend printing it; it is short and very good as a reference.
2. The second one is from WikiBooks and is simply called ‘ $\text{\LaTeX}$ ’; it can be [found online here](#). It comes in both a printable PDF version and an online version, but the online HTML version is much, much nicer and easier to search. I recommend you bookmark it or include the keyword “wikibooks” in your search engine text field next time you search for  $\text{\LaTeX}$  help.