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GEA
Gioco Educazione Alimentare

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To someone very special...

Acknowledgments

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First chapter

1.1 Lorem ipsum

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quisque lectus mi, aliquet ac lectus at, luctus ornare enim. Donec eleifend ornare ante. Curabitur non adipiscing risus. Vivamus congue sem non magna tristique, ut pellentesque diam ornare. Donec eget arcu congue, vulputate nisl et, aliquam tellus. Morbi tincidunt odio quis mi hendrerit aliquet sit amet sit amet lorem. Donec fringilla nec lectus nec lacinia. Aliquam eu nunc euismod, tempus neque in, consequat velit. Duis arcu quam, convallis quis ultricies vitae, semper in est. Aliquam congue sagittis tortor, eget blandit lorem ullamcorper id. Maecenas venenatis nec neque in consectetur. Nulla nisl turpis, elementum a enim interdum, tincidunt vehicula tortor. Praesent pulvinar mi sit amet condimentum placerat. Curabitur mollis libero non auctor condimentum. Suspendisse ante lectus, sodales vel mauris vel, pharetra laoreet eros.

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Chapter 2

Second chapter

These are general tips about few LaTeX and LyX functionalities.

2.1 Copy and paste raw LaTeX code

Sometimes it is necessary to insert raw LaTeX code in your document, LyX has a dedicated environment for that (Insert ▷ Tex code). By using the paste command (CTRL + V) to copy text into that type of environment, you get as result that everything is copied in a single line, all the carriage returns are ignored. To paste exactly what you have copied, use the special paste command which preserves the text formatting (CTRL + SHIFT + V or Edit ▷ Paste Special ▷ Plain Text).

2.2 Labels and cross-references

Labels are necessary to add cross-references in your thesis, use a label for each element that you have to reference to (Insert ▷ Label/Cross-reference). These elements are manly chapters, sections, subsections, figures, tables and algorithms.

This is Chapter 2, Section 2.2.

2.3 Figures

Figures, but also tables and algorithms, must be placed inside a floating environment. This type of LaTeX environment is very useful and automagically mix up text and images. Usually the Here if possible placement option is good for all images (right click on float: Figure then Settings). However, if the figure is not placed correctly you may enable the Ignore LaTeX rules option, usually that option solves every problem.

Figure 2.1 shows an example of a very nice animal.

A rarely known feature of LyX is the possibility to add the short caption. The short caption is the description of the figure used in the List of Figures section.

Figure 2.1: Detailed caption of this marvelous animal

Sometimes captions can be very long, in this case it is better to use a shorter one that is more readable in the page that lists all the figures. To add this caption, right click on the description of figure, then Insert short title.

It is not mandatory to add the short caption, it is only useful with very long captions to ensure a better legibility of the List of Figures section.

2.3.1 Subfigures

A very cool feature of LaTeX's figures is the possibility to have subfigures. For example, if there are two figures that represent the result of a test executed with two different values of a parameter, then a subfigure is a good way to organize the images.

Figure 2.2 is an example of these subfigures. References can be added to either the whole figure (Figure 2.2) or each subfigure (Figure 2.2a and Figure 2.2b).

(a) A nice squirrel

(b) A beautiful peacock

Figure 2.2: Fauna

2.4 Tables

The caption of tables must be placed before the table itself and not after. As for figures, tables can have a short caption that is used in the List of Tables section.

Academic publications, but also thesis, often use the so-called «formal table», an example of these particular style is showed in Table 2.1

Table 2.1: Detailed caption of this beautiful table

	Category			
	first	**second**	**Number**	**Complexity**
Item A	α	β	4	$\Omega(n)$
Item B	γ	δ	2	$\Omega\left(n^2\right)$

To set this particular style, right click in a cell of the table then More ▷ Settings ▷ Border, here you can select the formal style.

2.4.1 Wide tables

Sometimes tables are too wide for the column's width of the page. Rather than changing the table's content you can shrink it to fit the available space. The font size will be smaller but this is, in general, a good method to fix too wide tables such as Table 2.2, the result is showed in Table 2.3.

Table 2.2: This table is very wide

Method	**Parameter one**	**Parameter two**	**Parameter three**	**Parameter four**
A	1	2	3	4
B	5	7	9	11

Table 2.3: This table is shrunk to fit the column's width

Method	**Parameter one**	**Parameter two**	**Parameter three**	**Parameter four**
A	1	2	3	4
B	5	7	9	11

Another solution is to set the width of table's columns. To set it, right click in a cell of the table then More ▷ Settings ▷ Table settings, here you can set the width.

2.4.2 Space between rows

Another common problem with tables is when rows of the table are too close together, this problem is very frequent when rows contain mathematical expressions

such as Table 2.4. With a simple command it is possible to increase the space between rows as showed in Table 2.5.

Table 2.4: This table is a bit tight

Name	Formula
Gaussian integral	$\int_0^{+\infty} e^{-\frac{x^2}{2}} \mathrm{dx} = \frac{1}{2}\sqrt{\frac{\pi}{2}}$
Taylor series	$\sum_{n=0}^{\infty} \frac{f^{(n)}(a)}{n!}(x-a)^n$

Table 2.5: Math cheatsheet

Name	Formula
Gaussian integral	$\int_0^{+\infty} e^{-\frac{x^2}{2}} \mathrm{dx} = \frac{1}{2}\sqrt{\frac{\pi}{2}}$
Taylor series	$\sum_{n=0}^{\infty} \frac{f^{(n)}(a)}{n!}(x-a)^n$

2.5 Algorithms

If you have to add some algorithms there is a dedicated LyX environment. As for tables, the caption of an algorithm must be placed before the pseudo code of the algorithm, short captions can be used also for algorithm. This placement of the caption may sound strange but is justified by the fact that algorithms, but also tables, are read from the top down, so the description must be placed before the content. On the other side, figures are viewed like a painting, so the description must be placed below the content.

Algorithm 2.1 Detailed caption of this complicated algorithm

1. Wake up
   (a) drink a coffee
   (b) brush your teeth
2. Go to work
3. Come back home
4. Go to sleep

Unfortunately LyX does not support algorithm commands offered by some LaTeX packages (`\If`, `\While`, ...) out of the box. It is possible to use custom modules to handle those commands or use the 2.1 beta version that supports some of them

but, as for now, it is better to write directly LaTeX code. This template uses the algorithmicx package, refer to the manual of that package (`http://www.ctan.org/pkg/algorithmicx`) for the documentation of all the commands. Algorithm 2.2 shows an example of the usage of some commands of the algorithmicx package.

Algorithm 2.2 Best algorithm ever

```
1: s ← ALIVE                                   ▷ Day of birth
2: while s ≠ EOL do
3:     repeat                                  ▷ Early morning, possibly
4:         Try to wake up
5:     until s = SLEEP
6:     Drink a coffe                           ▷ Even more than one
7:     Brush your teeth
8:     Go to work                              ▷ With a smile on your face
9:     Come back home
10:    Go to sleep
11: end while
```

2.6 Source code

You may need to add some pieces of source code that you have written. LyX uses listings package to provide a customized environment to insert source code (Insert ▷ Program Listing). Listings can have a caption, but LyX does not add it by default, if you want you can insert it (place the cursor inside the listing environment, then Insert ▷ Caption).

By default, the result that you get is pretty ugly as you can see in the Listing 2.1.

Listing 2.1: Program that computes your degree mark

```
#include <stdlib.h>
#include <stdio.h>

/**
 * Main program
 */
int main(int argc, char *argv[])
{
        long double degree_mark = 0x42 * 042 * 0b00101010 * 0.001167;

        printf("Congratulations for your degree\n");
        printf("Your mark is %-3.0LfL\n", degree_mark);
```

```
        return EXIT_SUCCESS;
}
```

You need to set a couple of options (right click inside the source code environment, then Settings) to get a good looking result. The most important options are

Font style use a fixed-length font (Font Family: Typewriter), it is useful to set a Small font size to compact large pieces of source code. Breaking long lines is very important as well as hiding nasty spaces (check Break long lines option, uncheck Space as symbol and Space in strings as symbol options, set Tabular size to 4)

Line numbering having the line numbering active is useful if you have to refer to a particular statement when you are describing you code

Language setting the proper language is important to have the correct syntax highlighting

The Listing 2.2 has the same code as the Listing 2.1 but it has all the options mentioned before adjusted, the result is way better that the other.

Listing 2.2: Program that computes your degree mark

```
1  #include <stdlib.h>
2  #include <stdio.h>
3
4  /**
5   * Main program
6   */
7  int main(int argc, char *argv[])
8  {
9      long double degree_mark = 0x42 * 042 * 0b00101010 *
           0.001167;
10
11     printf("Congratulations for your degree\n");
12     printf("Your mark is %-3.0LfL\n", degree_mark);
13
14     return EXIT_SUCCESS;
15 }
```

If you have to insert more than one piece of code it can be useful to copy the previously created environment and then modify it. This saves you from setting the options every time you insert a new listing.

2.7 URLs

LyX has a dedicated command to insert URLs (Insert ▷ URL) that must be used to insert each URL. The environment automatically uses a typewrite font for the text, inserts a hyperlink to the URL and, most importantly, breaks long URLs in multiple lines.

This is a URL added as simple text, http://this.is.not.the.correct.way.to.add.urls.in.lyx.documents.h

This is a URL created with the url command, `http://this.is.the.correct.way.to.add.urls.in.lyx.documents.html`.

The url environment can be manually used, for example, in the bibliography where URLs are not handled in a dedicated way. The Listing 2.3 shows how to use the url command in the bibliography.

Listing 2.3: How to insert URLs in the bibliography

```
1  % this URL will not be broken into multiple lines and
2  % will NOT have a hyperlink
3  @article{
4      ...
5      howpublished = {http://google.com}
6  }
7
8  % this URL WILL be broken into multiple lines and
9  % WILL have a hyperlink
10 @article{
11     ...
12     howpublished = {\url{http://google.com}}
13 }
```

2.8 LyX's guides

LyX has a series of guides that describe all its features, if want to exploit all the available functionalities you need to read them. Those manuals are available directly in LyX (for example, Help ▷ Embedded Objects).

Chapter 3

Third chapter

These are very personal suggestions, no offense will be taken if you completely ignore this chapter.

3.1 Manage bibliography

Manage a lot of bibliography resources by manually editing a bibtex file is very annoying, it is better to use something that manages for you all the references. Sadly, LyX does not have an easy to use system for doing that. However, there are other programs that can be used to automagically organize dozens of papers.

There are two famous programs, referencer and JabRef (`https://launchpad.net/referencer`, `http://jabref.sourceforge.net/`), both have a lot of useful features, the most notable are

- copy from clipboard of bibtex formatted references
- organization of references with labels
- possibility to associate a pdf to each reference
- the Cite in LyX button

3.2 Reviews

Your advisor will review what are you writing and he will, most likely, add annotations on a pdf. However, correction contained inside annotations are difficult to integrate, manly because you will spend a lot of time in finding where to modify your document. LyX supports a very powerful method to review a document, just look the examples below.

Where have you learned english stupid dumbass?

The derivative of e^x is e^{2x} .

After having considered all the other solutions we proved that this is the most efficient way to determine the medium length of horse's mane.

These result shows that the first method is way better than the second.
The integration of these reviews is much easier than reviews inside annotation of a pdf. Unfortunately you have to convince your advisor to use this system, I think it is worth a try.

This feature is called Change Tracking, there is a dedicated toolbar that you can show by activating the Change Track option (Document ▷ Change Tracking ▷ Track Changes or simply CTRL + SHIFT + E). This document has the Change Tracking option already enabled.

3.3 Final presentation

Once you have written your thesis you will have to present it. Timing is critical. You will have from 15 to 20 minutes to present the work of months. A very useful tool that you may use during your presentation is `pdfpc` (`http://davvil.github.io/pdfpc/`). By using this program, on the screen of your laptop you will have some additional information that are not showed on the external monitor. These extra information are

Time left you can set the duration of the presentation and see how many minutes and seconds you have left

Next slide you will see both the current and the next slide

Annotations you can add some annotation to remember you some key points that you may forget

This tool is very very useful, but do not forget that there is always the demo effect. You MUST try it before even thinking to use for your final presentation.

To install the program on a Linux system there should be a package named pdf-presenter-console, for other OS on the websites of the program there are the instruction how to install it.

Chapter 4

Fourth chapter

These are style suggestions that you can use to personalize and beautify your thesis.

4.1 Font

One important stylistic change that you can do is changing the font. The default one is Computer Modern which is ok, but there are other fonts that can be used. You can change the font in the properties of the document (Document ▷ Settings ▷ Fonts). Not all the fonts can be used when compiling with pdflatex, with some fonts you need to render the pdf with XeLaTeX or LuaLaTeX. Figure 4.1 shows two different examples of fonts combination.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quisque lectus mi, aliquet ac lectus at, luctus ornare enim. Donec eleifend ornare ante. Curabitur non adipiscing risus (0, 1, 2, 3, 4, 5, 6, 7, 8, 9).

The quick brown fox jumps over the lazy dog.

```
#include <stdio.h>
int main() {
 printf('Hello world\n');
 return 0;
}
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quisque lectus mi, aliquet ac lectus at, luctus ornare enim. Donec eleifend ornare ante. Curabitur non adipiscing risus (0, 1, 2, 3, 4, 5, 6, 7, 8, 9).

The quick brown fox jumps over the lazy dog.

```
#include <stdio.h>
int main() {
 printf('Hello world\n');
 return 0;
}
```

Figure 4.1: Two different font styles

The fonts used in the example are summarized in the Table 4.1.

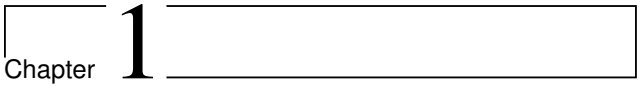
Table 4.1: Fonts used in the two examples showed before

Serif	Latin Modern Roman Unslanted	Gentium
Sans Serif	Latin Modern Sans Demi Condensed	Verdana
Typewriter	Latin Modern Mono Slanted	Inconsolata

If, by looking at the pdf, the letters look ugly check the property of the pdf, in particular the type of fonts used (how to find this information depends on the pdf viewer that you are using, if you are using Linux use pdffonts command). If your pdf has Type 3 fonts that is the reason why your pdf looks ugly. It is better to use Type 1 fonts, if you are running LyX on a Linux system by installing cm-super package you can fix this problem.

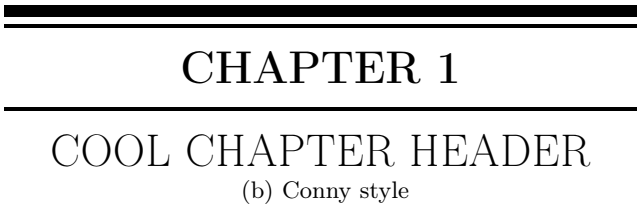
4.2 Fancy chapter header

The header of each chapter can be personalized as you like, this requires you to write a rather big amount of LaTeX code to get a nice result. However, there is package that provides a set of predefined styles, fncychap (`http://www.ctan.org/pkg/fncychap`). Figure 4.2 shows just two of the styles offered by the package.



Cool chapter header

(a) Lenny style



(b) Conny style

Figure 4.2: Two possible styles for headers of chapters

4.3 Fancy initial letters

Another thing that can be fancied are the initial letters. This is a very simple modification that you can do to add a personal touch to each chapter. There is a package that permits to customize, with various options, initial letters called lettrine

(`http://www.ctan.org/pkg/lettrine`). There are a lot of options to create your personal style for each initial, Figure 4.3 shows two possible styles of initials.

Nice initial letter. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ndictum Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis.

VERY nice initial letter. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ndictum Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis.

Figure 4.3: Two examples of initial letters

4.4 Fancy headers

Fancy headers are already used in this template, the package used is fancyhdr (`http://www.ctan.org/pkg/fancyhdr`). There are a lot of options, this template uses almost the standard style for the header but you can change it. For example, you may move the page numbering from the bottom header to the top header, or remove the horizontal line in the header, or ... . In this template the fancy header style is set in the LaTeX preamble of the thesis.lyx document (Document ▷ Settings ▷ LaTeX Preamble) and just before the Introduction chapter.

4.5 Other document classes

This template uses the book class, there are some more advanced classes that have a lot of cool features such as the one offered by koma-script or memoir (`http://www.ctan.org/pkg/koma-script`, `http://www.ctan.org/pkg/memoir`).

LyX supports a discrete number of those alternative classes, however to fully exploit the additional functionalities offered by those classes you have to write raw LaTeX code. If you want to deeply customize your thesis maybe it is better if you start considering to write it directly in LaTeX rather than using LyX.

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Fifth chapter

Chapter 6

Sixth chapter

Chapter 7

Seventh chapter

Chapter 8

Eighth chapter

Chapter 9

Ninth chapter

Conclusions

Appendix A

First appendix

Appendix B

Second appendix

Appendix C

Third appendix