



A VERY LONG AND IMPRESSIVE THESIS TITLE WITH A FORCED LINE BREAK

SOME THOUGHTS ON THE LIFE, THE UNIVERSE,
AND EVERYTHING ELSE

JOHN VERY LONGNAME DOE

Master/BSc in Name of Previous Degree

DOCTORATE IN STUDY PROGRAM NAME

NOVA University Lisbon
month, year



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Adviser: Mary Doe Adviser Name

Full Professor, NOVA University Lisbon

Co-advisers: John Doe Co-Adviser Name

Associate Professor, NOVA University Lisbon

John Doe other Co-Adviser Name

Full Professor, NOVA University Lisbon

Examination Committee

Chair: Name of the committee chairperson

Full Professor, FCT-NOVA

Rapporteur: Name of a rapporteur

Associate Professor, Another University

Members: Another member of the committee

Full Professor, Another University

Yet another member of the committee

Assistant Professor, Another University

DOCTORATE IN STUDY PROGRAM NAME
SPECIALIZATION IN SPECIALITY NAME

NOVA University Lisbon
month, year

©

Dedicatory lorem ipsum.

ACKNOWLEDGEMENTS

Acknowledgments are personal text and should be a free expression of the author.

However, without any intention of conditioning the form or content of this text, I would like to add that it usually starts with academic thanks (instructors, etc.); then institutional thanks (Research Center, Department, Faculty, University, FCT / MEC scholarships, etc.) and, finally, the personal ones (friends, family, etc.).

But I insist that there are no fixed rules for this text, and it must, above all, express what the author feels.

ABSTRACT

Regardless of the language in which the dissertation is written, usually there are at least two abstracts: one abstract in the same language as the main text, and another abstract in some other language.

The abstracts' order varies with the school. The default behaviour for the NOVAtesis LaTeX (`novathesis`) template is to have in first place the abstract in *the same language as main text*, and then the abstract in *the other language*. For example, if the dissertation is written in Portuguese, the abstract order will be first Portuguese and then English, followed by the main text in Portuguese. If the dissertation is written in English, the abstract order will be first English and then Portuguese, followed by the main text in English. The `novathesis` (L^AT_EX) template will automatically order the abstracts by considering this rule. However, this order can be customized by adding

```
\abstractorder(<MAIN_LANG>):={<LANG_1>, . . . , <LANG_N>}
```

to the file `5_packages.tex`. For example, for a main document written in German with abstracts written in German, English and Italian (by this order) use:

```
\abstractorder(de):={de,en,it}
```

Concerning its contents, the abstracts should not exceed one page and may answer the following questions (it is essential to adapt to the usual practices of your scientific area):

1. What is the problem?
2. Why is this problem interesting/challenging?
3. What is the proposed approach/solution/contribution?
4. What results (implications/consequences) from the solution?

Keywords: One keyword, Another keyword, Yet another keyword, One keyword more, The last keyword

RESUMO

Independentemente da língua em que a dissertação está escrita, geralmente esta contém pelo menos dois resumos: um resumo na mesma língua do texto principal e outro resumo numa outra língua.

A ordem dos resumos varia de acordo com a escola. O comportamento padrão para o template **novathesis** é ter em primeiro lugar o resumo *na mesma língua do texto principal* e depois o resumo *na outra língua*. Por exemplo, se a dissertação for escrita em português, a ordem dos resumos será primeiro em português e depois em inglês, seguido do texto principal em português. Se a dissertação for escrita em inglês, a ordem dos resumos será primeiro em inglês e depois em português, seguido do texto principal em inglês. O template **novathesis** (L^AT_EX) irá ordenar automaticamente os resumos por uma ordem apropriada. No entanto, esta ordem pode ser personalizada adicionando

```
\abstractorder(<MAIN_LANG>):={<LANG_1>, . . . , <LANG_N>}
```

ao ficheiro **5_packages.tex**. Por exemplo, para um documento escrito em Alemão com resumos em Alemão, Inglês e Italiano (por esta ordem), pode usar-se:

```
\abstractorder(de):={de,en,it}
```

Relativamente ao seu conteúdo, os resumos não devem ultrapassar uma página e frequentemente tentam responder às seguintes questões (é imprescindível a adaptação às práticas habituais da sua área científica):

1. Qual é o problema?
2. Porque é que é um problema interessante/desafiante?
3. Qual é a proposta de abordagem/solução?
4. Quais são as consequências/resultados da solução proposta?

Palavras-chave: Primeira palavra-chave, Outra palavra-chave, Mais uma palavra-chave, A última palavra-chave

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GLOSSARY

computer An electronic device which is capable of receiving information (data) in a particular form and of performing a sequence of operations in accordance with a predetermined but variable set of procedural instructions (program) to produce a result in the form of information or signals. This is a test that adds a citation [2] to the glossary! (*p. 19*)

ACRONYMS

μ	Mu (p. 19)
aaa	acronym aaa (p. 19)
aab	acronym aab (p. 19)
aba	acronym aba (p. 19)
abbrev	abbreviation of a longer text (p. 19)
bbb	acronym bbb (p. 19)
DI	Department of Computer Science (p. 2)
FCT	NOVA School of Science and Technology (pp. 2, 11)
NOVA	NOVA University Lisbon (p. 2)
novathesis	NOVAtesis LaTeX (pp. vi, viii, xii, xiii, 1–4, 6–14)
novathesis.cls	novathesis.cls class (p. 15)
xpto	and extension of a xpto xpto xpto xpto xpto xpto xpto xpto xpto xpto (p. 19)

S Y M B O L S

π the numerical value of pi (*p. 19*)

r the radius of a circle (*p. 19*)

CHEMICAL SYMBOLS

K^+ Ião positivo de Potássio (*p.* 19)

Na^+ Ião positivo de Sódio (*p.* 19)

INTRODUCTION



This is the **novathesis** L^AT_EX template Version 6.10.3 from 2022-09-12.

This work is licensed under the L^AT_EX Project Public License v1.3c. To view a copy of this license, visit the [LaTeX project public license](#).

1.1 If You Use this Template...

This first Chapter introduces the **novathesis** template and how it is organized. In Chapter 2 you can find some specific instructions on how to use the **novathesis** template. Chapter 3 shows some examples and give some hints on how to write your text. Please read these next Chapters carefully.

1.1.1 Your Time is Precious

Did you learn how to drive by sitting by the wheel and throwing your car into the road? Most probably you did take your time *learning the rules* and *practicing* first! Likewise, it is not wise to throw yourself at the task of writing a thesis/dissertation in L^AT_EX without seriously considering the following statement!

*If you are going to spend zillions of hours writing your thesis/dissertation using this **novathesis** template, be wise and spend a couple of hours learning how to use it properly by reading this manual. And then, be even wiser, and spend a few more hours learning some L^AT_EX. I am sure that*

the time you are investing now will pay itself countless times before you submit your thesis/dissertation.

João Lourenço

1.1.2 Recognition

The **novathesis** template was born in 1996, and what you see now accumulates to many many hundreds (thousands?!?) of working hours, unpaid and stolen from family and friends. This work is available to the community under the [LATEX Project Public License v1.3c](#), which means you are entitled to use it for free. However, if you decide to use this template to write your thesis/dissertation, **be fair to the developers** and:

1. Cite the **novathesis** manual [9] in a place of your choice (e.g., in the *Acknowledgments*) of your thesis/dissertation with “\cite{novathesis-manual}”. If you cite it this way, the correct entry will be added automatically to your bibliography (no need to worry with the necessary BibTeX entry, as it will be added automatically);
2. Go to the [project web page in GitHub](#) and give the project a star (marked with a red ellipse at the top-right in Figure 1.1); and
3. Make a donation by visiting the **novathesis** project page and clicking in the button marked with a green ellipse at the top-center in Figure 1.1). Alternatively, just click [HERE](#) and your browser will be directed to the right page.

1.2 The NOVAthesis template

The **novathesis** template was born at the [Department of Computer Science \(DI\)](#) of [NOVA School of Science and Technology \(FCT\)](#) of [NOVA University Lisbon \(NOVA\)](#), Portugal. But the user base grew... initially to other Departments of FCT-NOVA, then to other Schools of NOVA, and later to other Schools of other Universities. Currently more than 25 Schools are natively supported by the **novathesis** template (see Tables 1.1, 1.2, 1.3, 1.4, 1.5, and 1.6).

Table 1.1: NOVA University Lisbon’s Schools supported by the **novathesis** template

NOVA University Lisbon



NOVA School of Science and Technology (FCT-NOVA)

- All PhD Programs (PhD)
- All MSc Programs (MSc)



NOVA School of Social Sciences and Humanities (FCSH-NOVA)

- All PhD Programs (PhD)
- All MSc Programs (MSc)



NOVA Information Management School (NOVA-IMS)

- All PhD Programs (PhD)
- Master's in Data Science and Advanced Analytics (MMAA)
- Master's in Statistics and Information Management (MEGI)
- Master's in Information Management (MGI)
- Master's in Geographic Information Systems and Science (MCSIG)
- Master's in Geospatial Technologies (GeoTech)



National School of Public Health (ENSP-NOVA)

- All PhD Programs (PhD)
- All MSc Programs (MSc)



Instituto de Tecnologia Química e Biológica (ITQB-NOVA)

- All PhD Programs (PhD)
- All MSc Programs (MSc)

Table 1.2: University of Lisbon's Schools supported by the novathesis template

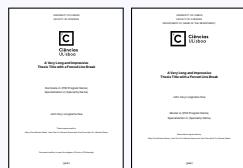
CHAPTER 1. INTRODUCTION

University of Lisbon



Instituto Superior Técnico (IST-UL)

- All PhD Programs (PhD)
- All MSc Programs (MSc)



Faculdade de Ciências (FCUL)

- All PhD Programs (PhD)
- All MSc Programs (MSc)



Faculdade de Medicina Veterinária (FMV-UL)

- All PhD Programs (PhD)
- All MSc Programs (MSc)

Table 1.3: University of Minho's Schools supported by the *novathesis* template

University of Minho



School of Architecture (EA-UMINHO)

- All PhD Programs (PhD)
- All MSc Programs (MSc)



School of Sciences (EC-UMINHO)

- All PhD Programs (PhD)
- All MSc Programs (MSc)



School of Law (ED-UMINHO)

- All PhD Programs (PhD)
- All MSc Programs (MSc)



School of Engineering (EE-UMINHO)

- All PhD Programs (PhD)
- All MSc Programs (MSc)



School of Economics and Management (EEG-UMINHO)

- All PhD Programs (PhD)
- All MSc Programs (MSc)



School of Medicine (EM-UMINHO)

- All PhD Programs (PhD)
- All MSc Programs (MSc)



School of Psychology (EP-UMINHO)

- All PhD Programs (PhD)
- All MSc Programs (MSc)



School of Nursing (ESE-UMINHO)

- All PhD Programs (PhD)
- All MSc Programs (MSc)



Institute of Social Sciences (ICS-UMINHO)

- All PhD Programs (PhD)
- All MSc Programs (MSc)



Institute of Education (IE-UMINHO)

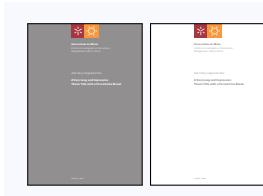
- All PhD Programs (PhD)
- All MSc Programs (MSc)



School of Arts and Humanities (ILCH-UMINHO)

- All PhD Programs (PhD)
- All MSc Programs (MSc)

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Research Institute 13Bs ([I3B-UMINHO](#))

- All PhD Programs ([PhD](#))
- All MSc Programs ([MSc](#))

Table 1.4: Instituto Politécnico de Lisboa's Schools supported by the [novathesis](#) template

Instituto Politécnico de Lisboa

Instituto Superior de Engenharia de Lisboa ([ISEL-IPL](#))

- All MSc Programs ([MSc](#))

Table 1.5: Instituto Politécnico de Setúbal's Schools supported by the [novathesis](#) template

Instituto Politécnico de Setúbal

Escola Superior de Tecnologia de Setúbal ([ISEL-IPL](#))

- All MSc Programs ([MSc](#))

Table 1.6: Other Universities/Schools/Degrees's Schools supported by the [novathesis](#) template

Other Universities/Schools/Degrees

Escola Superior de Enfermagem do Porto ([ESEP](#))

- All MSc Programs ([MSc](#))

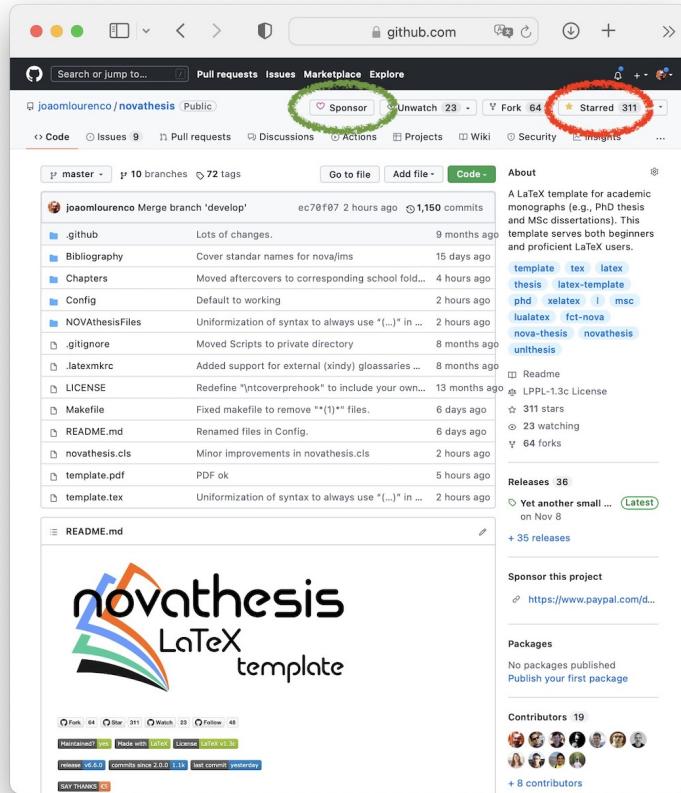


Figure 1.1: The **novathesis** project web page in GitHub.

1.3 Getting Started

The template provides an *easy to use* setting for you to write your thesis/dissertation in L^AT_EX:

- Select your school;
- Fill your thesis metadata (title, research field, etc) in the file “`template.tex`”;
- Create your thesis/dissertation contents using the files in folder “`Chapters`”; and
- Process using you favorite L^AT_EX processor (pdfL^AT_EX, X_EL^AT_EX or LuaL^AT_EX).

1.3.1 Using Overleaf

If you do not have an account in Overleaf, you must [create one first](#).

Once you have an account, please access the **novathesis** template in Overleaf and select the green button *Open as Template* (see Figure 1.2).

Please notice that the version currently available in Overleaf (v6.5.3) is slightly outdated (current version is v6.10.3). A new version will be submitted to Overleaf soon. Until then, please:

1. Download the [latest version](#) from the GitHub repository as a Zip file.
2. Login to your favorite LaTeX cloud service. I recommend [Overleaf](#) but there are alternatives (these instructions apply to Overleaf and you'll have to adapt for other providers).
3. In the menu select: New project → Upload project.
4. Upload the zip file.
5. Select "template.tex" as the main file.
6. Let Overleaf compile the document.



Figure 1.2: NOVAthesis template in Overleaf.

First of all, start by installing \LaTeX in your computer. There are two main distributions, [Mik\TeX](#) and [TeXLive](#), and both of them are available for the 3 most popular Operating Systems: Linux, macOS and Windows.

Be aware that a full installation of Mik\TeX or TeXLive will take near 5 GB of hard disk space. So, think twice before installing the full distribution. See the [novathesis](#) Wiki for the [list of packages required to compile the template](#).

Once you have \LaTeX up and running, remember to install a good \LaTeX text editor. I recommend you to take a look at [this post](#) in the [tex.stackexchange.com](#) site. If you want a quick and dirty recommendation, try [TeXStudio](#).

Now, you must access the [novathesis](#) repository in [GitHub](#), select the green button *Code* and then *download* (or *clone*) the template. You will always get the latest version of the template (currently v6.10.3 from 2022-09-12).

1.4 Getting Help

No! You don't have to use this template to write your thesis. You don't even have to use \LaTeX . However, writing a thesis is serious stuff, and which tool you shall use to write it is not a decision to make lighthearted.

L^AT_EX is hard enough by itself. This template aims at making your life easier, but not easy. If you choose to use this template to write your thesis, you are very welcome. However, don't expect me to provide you help with L^AT_EX. Look for help with your friends (you have some friends, don't you?), or search the web, or try even to read some book(s) on L^AT_EX. In the end you will certainly find the experience rewarding.

When you come to the point of "*How do I do this with L^AT_EX?*", remember...

1. To check the [novathesis wiki](#) and have some hope! 😊
2. Google is your best friend.
3. Search the [GitHub Discussions page](#) for a question related to yours. *If and only if* you don't find one, then post your own question in English please!
4. Search the [NOVAtheis Facebook group](#) for a question related to yours. *If and only if* you don't find one, then post your own question in either Portuguese or English, at your preference.

When you post your own question, remember to **always** state the [novathesis](#) version number you are using and referring to.

Please do not attempt to contact me directly (email, Messenger, etc)...
I WILL NOT REPLY!

1.4.1 Suggestions, Bugs and Feature Requests

Help: If you just need some help, see above [Section 1.4](#).

Suggestion: Do you have a suggestion/recommendation? Please add it to the [wiki](#) and help other users!

Bug: Did you find a bug? Please open an issue. Thanks!

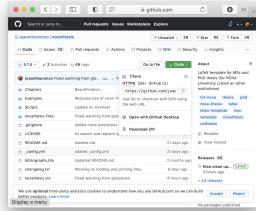
New Feature: Would you like to request a new feature (or support of a new School)? Please open an issue. Thanks!

1.5 Donors

The [list of Donors](#) is available in the [novathesis](#) Project page.

1.6 Disclaimer

Although the **novathesis** template is endorsed by some Schools (e.g., [linked from FCT-NOVA web site](#)), the **novathesis** template **this not an official template** for any School.



emplate exists to make your life easier and we do our best
iant to the supported (+25) Schools' regulations but, in the
ou and only you are accountable for both the look and the
ocument you submit as your thesis/dissertation.

Figure 1.3: The NO-
VAthesis Project page in
GitHub.

NOVATHESIS TEMPLATE *USER'S MANUAL*

This manual is outdated and must be revised!

2.1 Introduction

This Chapter describes how to use the NOVATHESIS *LaTeX* (`novathesis`) template. It is assumed that you have a working installation of *LaTeX*, either local (in your own computer) or remote (in Overleaf), and that you were able to generate a PDF for the default configuration of the template: a PhD thesis for NOVA School of Science and Technology (FCT).

2.2 Quick Start

2.2.1 With a Local *LaTeX* Installation

Follow these steps to get started with a local *LaTeX* installation:

1. Download *LaTeX*. There are two major *LaTeX* distributions — `MiKTeX` and `TeXLive` — that share lots of similarity, and *LaTeX* documents are portable between them. This means that, for most users, both systems are equally usable.

`TeX-Live` is maintained by (La)TeX developers and is certainly the best distribution you may install in your computer: However, the default distribution will take more than 5 GB on your hard disk... so, if you are not short on disk space, install `TeXLive`!

`MiKTeX` will, by default, install only a minimal set of packages. The extra/additional packages will be installed on the fly. Installing packages on the fly is useful if disk space is limited, but has its own

caveats in the longer term. Definitely choose Mik \TeX if you're short on disk space.

Which one to download? There are [pros and cons for both distributions](#) so it is essentially a question of where does your hear falls first! Mine is in Te \TeX Live, but yours can be elsewhere! 😊

2. Install \LaTeX .

Full distribution: Installing a full distribution (valid for both Te \TeX Live and Mik \TeX) means you will have all the possibly relevant files in your computer. Almost any \LaTeX file from almost any source will compile successfully in your computer.

Basic/minimal distribution: Installing a basic/minimal distribution (also valid for both Te \TeX Live and Mik \TeX) means your \LaTeX installation will be able to compile simple documents, but you will have to add additional packages (extensions) whenever required by more complex \LaTeX documents. Mik \TeX makes the user's live very easy by downloading these packages automatically, while Te \TeX Live expects the user to identify and install the required packages.

3. Download the `novathesis` template by either:

- Cloning the [GitHub repository](#) with

```
git clone --depth=1 https://github.com/joaomlourenco/novathesis.git
```

or

- Downloading the [latest version from the GitHub repository as a Zip file](#).

4. Download additional School specific files if applicable:

Universidade do Minho (UMINHO) download the required *NewsGotT* font files from

<https://github.com/joaomlourenco/novathesis-extras/raw/main/Fonts/NewsGotT.zip>

then unzip the file and copy the 3 font files “n015002t.ttf”, “n015003t.ttf”, and “n015006t.ttf” to the folder “NOVAthesisFiles/FontStyles/Fonts”.

Escola Superior de Enfermagem do Porto (ESEP) download the required *Calibri* font files from

<https://github.com/joaomlourenco/novathesis-extras/raw/main/Fonts/Calibri.zip>

then unzip the file and copy the 4 font files

“Calibri.ttf”, “Calibrib.ttf”, “Calibrii.ttf”, and
“Calibriz.ttf”

to the folder

NOVAthesisFiles/FontStyles/Fonts.

5. Compile the document with you favorite LaTeX processor (pdfLaTeX, XeLaTeX or LuaLaTeX).
 - The main file is named “`template.tex`”, but you are free to rename it as you please.
 - Either load the main file in your favorite [LaTeX text editor](#) and press the appropriate (*magic*) button to generate a PDF file, or open a terminal and compile it with “`latexmk -pdf template`”. If you use a [L^AT_EX](#) text editor, please notice that the `novathesis` template uses “`biber`” and not “`bibtex`” to process the bibliography, which means that most probably you have to open the *Editor Preferences* and somewhere (depending on the Editor you are using) change “`bibtex`” to “`biber`”.
 - Notice that, due to the external font sets used, pdfL^AT_EX will not work for both **UMINHO** and **ESEP**, and you have to use either X_EL^AT_EX or LuaL^AT_EX.

6. Edit the files in the “Config” folder:

File	Contents
<code>0_memoir.tex</code>	Options specific for the memoir package. <i>Don't touch this file unless you know what you are doing!</i>
<code>1_novathesis.tex</code>	Configure the template (e.g., the document type, the school, the languages used, etc.)
<code>2_biblatex.tex</code>	Configure the bibliography.
<code>3_cover.tex</code>	Configure cover contents (e.g., author's name, thesis/dissertation title, advisers, committee, etc)
<code>4_files.tex</code>	Configure the files for chapters, appendices, annexes, abstracts, glossaries, etc...
<code>5_packages.tex</code>	Configure additional packages and commands.
<code>6_list_of.tex</code>	Configure the lists to be printed (table of contents, list of figures, list of tables, list of listings, etc). <i>Don't touch this file unless you know what you are doing!</i>
<code>9_nova_fct.tex</code>	Configuration specific to NOVA-FCT.
<code>9_nova_ims.tex</code>	Configuration specific to NOVA-IMS.
<code>9_nova_itqb.tex</code>	Configuration specific to NOVA-ITQB.
<code>9_ulisboa_fmv.tex</code>	Configuration specific to ULISBOA-FMV.
<code>9_uminho.tex</code>	Configuration specific to UMINHO (all Schools).

7. Recompile de document.

8. And you're done with a beautifully formatted thesis/dissertation! 😊

2.2.2 With a Remote Cloud-based Service

Follow these steps to get started with a remote L^AT_EX installation:

- Download the [latest version from the GitHub repository as a Zip file](#).
- Login to your favorite L^AT_EX cloud service. I recommend [Overleaf](#) but there are alternatives. These instructions apply to Overleaf and you'll have to adapt for other providers.
- In the menu select [New project](#) → [Upload project](#).
- Select “`template.tex`” as the main file.
- Follow from Step 5 above in Section 2.2.1 (With a Local L^AT_EX Installation).

2.3 Folder and Files

The `novathesis` template is organized into many files and folders. At the main level it includes the following files and folders listed in Table 2.1.

Table 2.1: The folders and files.

Name	Type	Access	Contents
<code>novathesis.cls</code>	<code>file</code>		The main class file.
<code>template.tex</code>	<code>file</code>		The main template file. You need to <i>compile</i> this file with one of pdfL ^A T _E X, X _E L ^A T _E X, or LuaL ^A T _E X to obtain the PDF file (“ <code>template.pdf</code> ”).
<code>template.pdf</code>	<code>file</code>		A possible result of applying pdfL ^A T _E X to the “ <code>template.tex</code> ” file. The look and feel of the document will depend on the parametrization/configuration (e.g., School) of this template.
<code>Chapters</code>	<code>folder</code>		Examples of document contents, including Chapters, Appendices, Annexes, Abstracts, Glossaries, Lists of Symbols, etc. Replace them with your own.
<code>Bibliography</code>	<code>folder</code>		Where all your bibliography files should be located. You may have as many as you want, as long as you add them to the template with “ <code>\ntaddfile{bib}{FILENAME.bib}</code> ”.
<code>NOVAthesisFiles</code>	<code>folder</code>		Additional files for the <code>novathesis</code> template. Unless you know what you are doing, avoid messing up with the files and folders inside this folder.

2.4 novathesis.cls Class Options

The `novathesis.cls` class (`novathesis.cls`) can be customized with the options listed below.

docdegree=OPT <i>phd(*), phdplan, phdprop, msc, mscplan, bsc, plain</i>	The type of the document. phd → PhD thesis (<i>default</i>) phdplan → PhD thesis plan phdprop → PhD thesis proposal msc → MSc dissertation mscplan → MSc dissertation plan bsc → BSc report plain → Other report
school=OPT <i>nova/fct, nova/fcsh, nova/ims, nova/ensp, nova/itqb, ulisboa/ist, ulisboa/fc, ulisboa/fmv, uminho/ea, uminho/ec, uminho/ed, uminho/ee, uminho/eeg, uminho/em, uminho/ep, uminho/ese, uminho/ics, uminho/ie, uminho/ilch, uminho/i3b, iscteiul/eta, ips/ests, ipi/isel, ulht/deisi, other/esep</i>	The name of the school. This option changes the typesetting of the cover and some School specific formating, like margins, fonts, paragraph spacing and indentation, etc...
lang=OPT <i>en(*), pt</i>	The main language for the document. Currently only Portuguese and English are supported. Other languages are expected to be support in forthcoming versions.
fontstyle=OPT <i>bookman, charter, fourier, kpfonts(*), mathpazo1, mathpazo2, newcent</i>	The font set to be used in the document. Please note that a font set include definitions for the main text, headings, maths, etc.
chapstyle=OPT <i>bianchi, bluebox, brotherton, dash, default, elegant(*), ell, ger, hansen, ist, jenor, lyhne, madsen, pedersen, veelo, vz14, vz34, vz43</i>	The chapter style The look of the chapter beginning.
coverlang=OPT <i>en, pt(*)</i>	The language to be used when typesetting the cover page.

otherlistsat=OPT <i>front(*), back</i>	Where to put the other lists besides the table of contents. The default is (front) before the main text. But some scientific areas prefer them at the end of the document (back), just before the Appendixes.
statement=OPT <i>true, false(*)</i>	Include or don't include the contents of the "statement" file. The default is for this file to be ignored (if it exists).
linkscolor=OPT <i>darkblue(*), black</i>	The color for all the hyperlinks in the PDF file. The "media=paper" option (see below) will override this option to "black"
spine=OPT <i>true, false(*)</i>	Generate the book spine and the last page in the PDF.
biblatex=OPT <i>OPT={list of options for biblatex}</i>	Customize biblatex, the bibliography management system used in this class. Probably you will want to change the value of the biblatex "style" option. For other customizations of biblatex check its manual.
memoir=OPT <i>OPT={list of options for memoir}</i>	Customize the base class memoir. The memoir manual should be the first document to be consulted when looking for " how can I do this? " You may want to change the base font size from 11pt to a smaller (10pt) or larger (12pt) size. Also, remember to change the "draft" to final when your document is finished.
media=OPT <i>screen(*), paper</i>	Behavior to be customized in the school options/configuration. Expected definitions for screen are: left and right margins are equal and use colored links. Expected definitions for paper are: left and right margins are different and use black links.

2.5 Additional considerations about the class options

In this section we will provide some additional considerations about some of the customizations available as class options.

2.5.1 The main language

The choice of the main language with the option “`lang=OPT`” affects:

- **The order of the summaries.** First is printed the abstract in the main language and then in the foreign language. This means that if your main language for the document in English, you will see first the “abstract” (in English) and then the “resumo” (in Portuguese). If you switch the main language for the document for Portuguese, it will also automatically switch the order of the summaries to “resumo” and then “abstract”.
- **The names for document sectioning.** E.g., “Chapter” vs. “Capítulo”, “Table of Contents” vs. “Índice”, “Figure” vs. “Figura”, etc.
- **The type of documents in the bibliography.** E.g., “Technical Report” vs. “Relatório Técnico”, “PhD Thesis” vs. “Tese de Doutoramento”, etc.

No matter which language you chose, you will always have the appropriate hyphenation rules according to the language at that point. You always get Portuguese hyphenation rules in the “Resumo”, English hyphenation rules in the “Abstract”, and then the main language hyphenation rules for the rest of the document.

2.5.2 Class of Text

You must choose the class of text for the document. The available options are:

1. **bsc** — BSc graduation report.
2. ***mscplan** — Preparation of MSc dissertation. This is a preliminary report graduate students at DI-FCT-NOVA must prepare to conclude the first semester of the two-semesters MSc work. The files specified by `\ntdedicatoryfile` and `\acknowledgmentsfile` are ignored, even if present, for this class of document.
3. **msc** — MSc dissertation.
4. **phdprop** — Proposal for a PhD work. The files specified by `\ntdedicatoryfile` and `\acknowledgmentsfile` are ignored, even if present, for this class of document.
5. **prepphd** — Preparation of a PhD thesis. This is a preliminary report PhD students at DI-FCT-NOVA must prepare before the end of the third

semester of PhD work. The files specified by `\ntdedicatoryfile` and `\acknowledgmentsfile` are ignored, even if present, for this class of document.

6. **phd** — PhD dissertation.

2.5.3 Printing

You must choose how your document will be printed. The available options are:

1. **oneside** — Single side page printing.
2. ***twoside** — Double sided page printing.

2.5.4 Font Size

You must select the encoding for your text. The available options are:

1. **11pt** — Eleven (11) points font size.
2. ***12pt** — Twelve (12) points font size. You should really stick to 12pt...

2.5.5 Text Encoding

You must choose the font size for your document. The available options are:

1. **latin1** — Use Latin-1 ([ISO 8859-1](#)) encoding. Most probably you should use this option if you use Windows;
2. **utf8** — Use [UTF8](#) encoding. Most probably you should use this option if you are not using Windows.

2.5.6 Examples

Let's have a look at a couple of examples:

- Preparation of PhD thesis, in portuguese, with 11pt size and to be printed single sided (I wonder why one would do this!)
`\documentclass[prepphd,pt,11pt,oneside,latin1]{thesisdifct-nova}`
- MSc dissertation, in English, with 12pt size and to be printed double sided
`\documentclass[msc,en,12pt,twoside,utf8]{thesisdifct-nova}`

2.6 How to Write Using L^AT_EX

Please have a look at Chapter 3, where you may find many examples of L^AT_EXconstructs, such as Sectioning, inserting Figures and Tables, writing Equations, Theorems and algorithms, exhibit code listings, etc.

2.7 Example glossary, acronyms, and symbols

This is the first occurrence of an abbreviation: **abbreviation of a longer text (abbrev)**. And now the second occurrence of the same abbreviation: **abbrev**. And a new acronym with capital letter: **And extension of a xpto (xpto)** and reused **xpto**. Let's also use a few other acronyms such as **acronym aaa (aaa)**, **acronym aab (aab)**, **acronym aba (aba)**, **acronym bbb (bbb)** and **xpto**. In geometry, the area enclosed by a circle of radius **r** is πr^2 . Here the Greek letter **π** is equal to the ratio of the circumference of any circle to its diameter. Lets add “**computer**” to the glossary! Be carefull with mathematical symbols in acronyms, please see the definition of **Mu (μ)**.

Reference to Potassium **K^+** and Sodium **Na^+** as well.

A SHORT LATEX TUTORIAL WITH EXAMPLES

This Chapter aims at exemplifying how to do common stuff with LATEX. We also show some stuff which is not that common! ;)

Please, use these examples as a starting point, but you should always consider using the *Big Oracle* (aka, [Google](#), your best friend) to search for additional information or alternative ways for achieving similar results.

3.1 Document Structure

3.2 Dealing with Bibliography

Citing something online [4, 5, 7].

3.3 Inserting Tables

3.4 Importing Images

3.5 Floats, Figures and Captions

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer 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 metus eu enim. Vestibulum pellentesque felis eu massa.

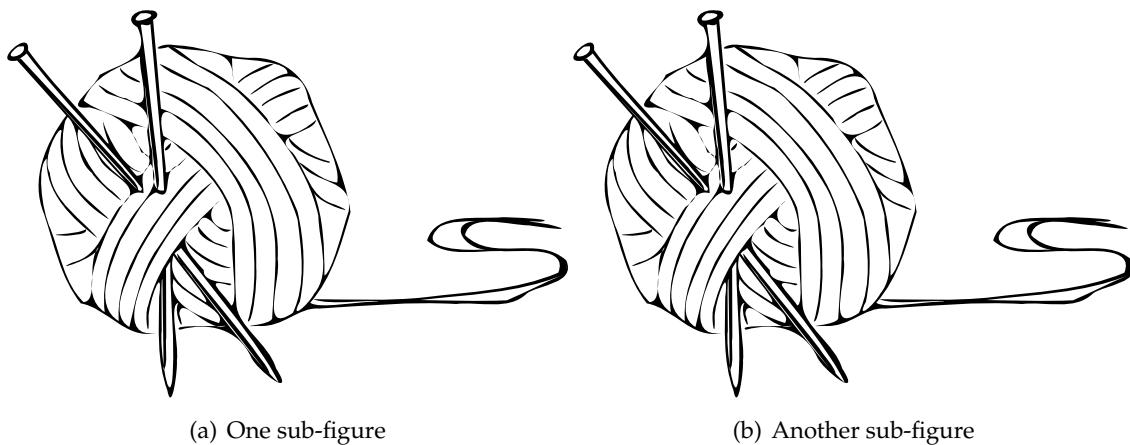


Figure 3.1: A figure with two sub-figures!

And this is a small text that references the Figure 3.1 and its Subfigures 3.1(a) and 3.1(b).

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida

mauris. Nam arcu libero, nonummy eget, consectetuer 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 metus eu enim. Vestibulum pellentesque felis eu massa.

3.6 Text Formatting

3.7 Generating PDFs from L^AT_EX

3.7.1 Generating PDFs with pdflatex

You may create PDF files either by using `latex` to generate a DVI file, and then use one of the many DVI-2-PDF converters, such as `dvipdfm`.

Alternatively, you may use `pdflatex`, which will immediately generate a PDF with no intermediate DVI or PS files. In some systems, such as Apple, PDF

is already the default format for LATEX. I strongly recommend you to use this approach, unless you have a very good argument to go for `latex + dvipdfm`.

A typical pass for a document with figures, cross-references and a bibliography would be:

```
$ pdflatex template  
$ bibtex template  
$ pdflatex template  
$ pdflatex template
```

You will notice that there is a new PDF file in the working directory called `template.pdf`. Simple :)

Please note that, to be sure all table of contents, cross-references and bibliographic citations are up-to-date, you must run `latex` once, then `bibtex`, and then `latex` twice.

3.7.2 Dealing with Images

You may process the same source files with both `latex` or `pdflatex`. But, if your text include images, you must be careful. `latex` and `pdflatex` accept images in different (exclusive) formats. For `latex` you may use EPS ou PS figures. For `pdflatex` you may use JPG, PNG or PDF figures. I strongly recommend you to use PDF figures in vectorial format (do not use bitmap images unless you have no other choice).

3.7.3 Creating Source Files Compatible with both `latex` and `pdflatex`

Do not include the extension of the file in the `\includegraphics` command.

E.g., use

`\includegraphics{sonwman}`

and not

`\includegraphics{sonwman.eps}`.

If you use the first form, `latex` or `pdflatex` will add an appropriate file extension.

This means that, if you plan to use only `pdflatex`, you need only to keep (preferably) a PDF version of all the images. If you plan to use also `latex`, then you also need an EPS version of each image.

To be included in the sections above

Para fazer citações, deverá usar-se a chave da referência no ficheiro BibTeX. Se for uma única referência [2], usar um “~” para ligar o \cite{...} à palavra que o precede (... referência~\cite{Artho04}). Caso queira fazer múltiplas citações [11, 12, 10], deverá agrupá-las dentro de um único \cite{...}.

Note que o ficheiro de bibliografia pode ter tantas entradas quantas quiser. Apenas aquelas cuja chave seja referenciada no texto é que serão incluídas na listagem de bibliografia.

Footnotes¹ will be numbered and shown in the bottom of the page.

A Tabela 3.1 ilustra alguns conceitos importantes associados à construção de tabelas:

- i) Não usar linhas verticais;
- ii) A legenda deve ficar por cima da tabela;
- iii) Usar as macros \toprule, \midrule e \bottomrule para fazer a linha horizontal superior, interiores e inferior, respectivamente.

Table 3.1: Test results summary.

Test	Anomalies	Warnings	Correct	Categories	Missed
Connection [3]	2	2	1	C	1
Coordinates'03 [1]	1	4	1	2B, 1C	0
Local Variable [1]	1	2	1	A	0
NASA [1]	1	1	1	—	0
Coordinates'04 [2]	1	4	1	3C	0
Buffer [2]	0	7	0	2A, 1B, 2C, 2D	0
Double-Check [2]	0	2	0	1A, 1B	0
StringBuffer [6]	1	0	0	—	1
Account [13]	1	1	1	—	0
Jigsaw [13]	1	2	1	C	0
Over-reporting [13]	0	2	0	1A, 1C	0
Under-reporting [13]	1	1	1	—	0
Allocate Vector [8]	1	2	1	C	0
Knight Moves [3]	1	3	1	2B	0
Total	12	33	10	5A, 6B, 10C, 2D	2

As figuras a inserir no documento deverão ser de qualidade, preferencialmente em formato vectorial (PDF vectorial) e não em *bitmap* (PNG, JPG, etc). As

¹This is a simple footnote.

imagens *bitmap* (Figura 3.2) não escalam bem e têm reflexos negativos na qualidade do seu documento. Pelo contrário, as imagens *vectoriais* Figura 3.3 escalam muito tanto quanto o necessário sem degradar a qualidade da imagem.

Só deve usar *screenshots* se não tive mesmo nenhuma alternativa. Em vez de gerar um *screenshot*, tente usar uma impressora virtual PDF e imprimir para um ficheiro PDF. Regra geral obterá um PDF vetorial. Mesmo que o seu PDF contenha imagens, elas terão sempre qualidade maior ou igual à que obteria com um *screenshot*.

Para agregar várias figuras numa única... Poderá assim referenciar o conjunto como Figura 3.4 ou as sub-figuras separadamente como 3.4() e 3.4(a).

3.8 Equações

O LaTeX é uma ferramenta poderosa para escrever em estilo matemático. Permite inserir fórmulas no meio do texto como por exemplo esta: $ax^2+bx+c = 0$. Também permite que as fórmulas sejam destacadas numa linha separada e centradas na página

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

ou numeradas

$$\text{aaa} \tag{3.1}$$

que depois pode ser referida no texto como sendo a equação 3.1

aa

$$a \tag{3.2}$$

$$b \tag{3.3}$$

$$c \tag{3.4}$$

$$d \tag{3.5}$$

3.9 Test for listings

Testing the package “listings”...

Testing the package “minted”...

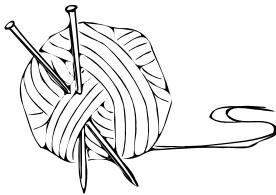
Blah...



Figure 3.2: Imagem em formato *bitmap* (JPG)



Figure 3.3: Imagem em formato PDF vectorial



(a) Novelo de lã



(b) Tempestade com neve

Figure 3.4: Exemplo de utilização de *subbottom*

3.10 Test for algorithms

Uncomment the algorithms source below and add the following to file “`5_packages.tex`”

```
\usepackage{algorithm2e}  
\RestyleAlgo{ruled}
```

and uncomment

```
\ntaddlistof{listofalgorithms}
```

in file “`8_list_og.tex`”.

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I

ANNEX 1 LOREM IPSUM

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 metus eu enim.

ANNEX I. ANNEX 1 LOREM IPSUM

Vestibulum pellentesque felis eu massa.

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetur adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus semper, leo velit ultricies tellus, ac venenatis arcu wisi vel nisl. Vestibulum diam. Aliquam pellentesque, augue quis sagittis posuere, turpis lacus congue quam, in hendrerit risus eros eget felis. Maecenas eget erat in sapien mattis porttitor. Vestibulum porttitor. Nulla facilisi. Sed a turpis eu lacus commodo facilisis. Morbi fringilla, wisi in dignissim interdum, justo lectus sagittis dui, et vehicula libero dui cursus dui. Mauris tempor ligula sed lacus. Duis cursus enim ut augue. Cras ac magna. Cras nulla. Nulla egestas. Curabitur a leo. Quisque egestas wisi eget nunc. Nam feugiat lacus vel est. Curabitur consectetur.



