NOVA IMS Information Management School

MDSAA

Mestrado em

Data Science and Advanced Analytics

Full Title of the Thesis

An optional subtitle can be added

Student's Full Name

Master Thesis

presented as partial requirement for obtaining a Master's Degree in Data Science and Advanced Analytics

NOVA Information Management School
Instituto Superior de Estatística e Gestão de Informação
Universidade Nova de Lisboa

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Instituto Superior de Estatística e Gestão de Informação
Universidade Nova de Lisboa

Full Title of the Thesis

An optional subtitle can be added

by

Student's Full Name

Master Thesis presented as partial requirement for obtaining the Master's degree in Data Science and Advanced Analytics, with a specialization in Business Analytics

Supervised by

Supervisor's name, academic title (PhD; etc), Academic institution or School affiliation of the supervisor

March, 2025

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I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism, any form of undue use of information or falsification of results along the process leading to its elaboration. I further declare that I have fully acknowledged the Rules of Conduct and Code of Honor from the NOVA Information Management School.

[place, date]

Just type your name, not your signature

DEDICATION

Just if you want to dedicate your work to someone dear to you or to someone that inspired you in your life. Here is not the place for acknowledge, it is a distinct honour to someone, although it is optional.

ACKNOWLEDGEMENTS

This is an optional page, however it is always very important to acknowledge those who made this possible, like family, friends, colleagues, professors, staff, University, and those who anonymously participated in the data collection phase, for example.

ABSTRACT

The abstract should be between 150 and 400 words and include no bibliographical references. The abstract should be one paragraph only. If the document is in Portuguese, please provide a Portuguese language abstract first, and the abstract in English on the following page. Abstract text.

KEYWORDS

Information Management; Research Methods; Data Analysis; Methodology

Sustainable Development Goals (SDG):

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LIST OF ABBREVIATIONS AND ACRONYMS

IR	Information Retrieval
LLM	Large Language Model
RS	Recommender System

1. INTRODUCTION

Introduction

Example of a citation in parentheses (Hastie et al., 2009).

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Example of an inline citation Einstein, 1905. This is in a second bib file.

You can also add equations such as Equation 1.1, some algorithms (1).

$$E = mc^2 \tag{1.1}$$

Algorithm 1 Bubble Sort Algorithm

Input: An array A of length n
Output: Sorted array A
for $i = 1$ to $n - 1$ **do**
  for $j = 1$ to $n - i$ **do**
    if $A[j] > A[j + 1]$ **then**
      Swap $A[j]$ and $A[j + 1]$
    end if
  end for
end for
return A

You can also have some code listings: (See https://www.overleaf.com/learn/latex/Code_listing for documentation).

Listing 1.1: Example Listing

```
# This is a simple Python function
def greet(name):
    print("Hello, " + name + "!")

# Call the function
greet("Alice")
```

1.1. Section 1

Here is an image of Figure 1.1. There is also a basic table here, Table 1.1

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Figure 1.1.: This is the logo of the university.

Table 1.1.: Example of a basic LaTeX table. Note the caption is on top.

Column 1	Column 2	Column 3	Column 4	Column 5
A1	B1	C1	D1	E1
A2	B2	C2	D2	E2
A3	B3	C3	D3	E3
A4	B4	C4	D4	E4
A5	B5	C5	D5	E5
A6	B6	C6	D6	E6
A7	B7	C7	D7	E7
A8	B8	C8	D8	E8

1.2. Section 2

And now some lists!

An unnumbered list:

- Apples
- Bananas
- Cherries

And a numbered list:

1. First item
2. Second item
3. Third item

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1.2.1. Sub-Section 2-1: Examples of abbreviations

Information Retrieval (IR) plays a crucial role in many modern applications, including search engines and digital libraries. With the rise of Large Language Models (LLMs), the efficiency and accuracy of IR systems have significantly improved. Similarly, Recommender Systems (RSs) have benefited from advancements in deep learning, providing personalized recommendations based on user preferences.

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2. LITERATURE REVIEW

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3. METHODOLOGY

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APPENDIX A

Here's Table A1 in the Appendix. Note that the numbering is different from Table 1.1.

Table A1.: Example of a table in the Appendix.

Column 1	Column 2	Column 3	Column 4	Column 5
A1	B1	C1	D1	E1
A2	B2	C2	D2	E2
A3	B3	C3	D3	E3
A4	B4	C4	D4	E4
A5	B5	C5	D5	E5
A6	B6	C6	D6	E6
A7	B7	C7	D7	E7
A8	B8	C8	D8	E8

Algorithm A1 Algorithm in the Appendix

Input: An array A of length n
Output: Sorted array A
for $i = 1$ to $n - 1$ **do**
  for $j = 1$ to $n - i$ **do**
    if $A[j] > A[j + 1]$ **then**
      Swap $A[j]$ and $A[j + 1]$
    end if
  end for
end for
return A

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