



Master's thesis
Master's Programme in Data Science

Template for Master's thesis

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1. Introduction

The thesis should have an introduction chapter. Other chapters can be named according to the topic. In the end, some summary chapter is needed; see Chapter 5 for an example.

2. Figures and Tables

2.1 Figures on teeth

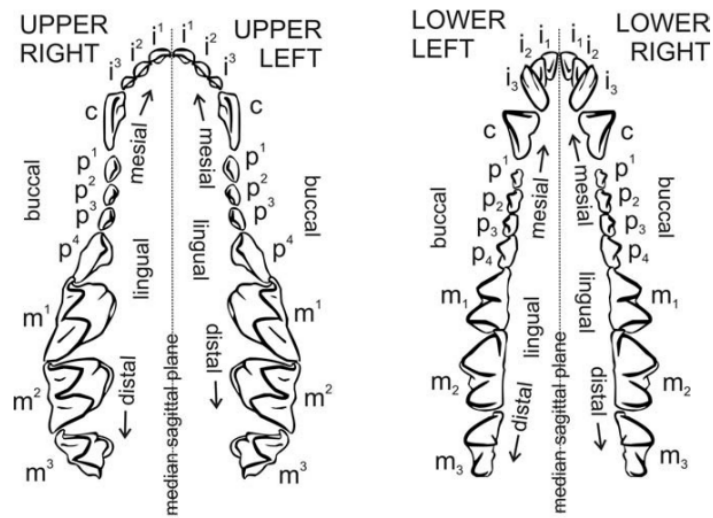


Figure 2.1: Mammal teeth composition, from Hillson [?].

Term	Meaning	Shorthands
Mandible	Lower jaw bone	mand.
Maxilla, Premaxilla	Upper jaw bones	
Deciduous	'Milk teeth'	D, d
Incisor	Tooth type (front, middle)	I, i
Canine	Tooth type (between incisor and premolar)	C, c
Premolar	Tooth type (between canine and molar)	P, p
Molar	Tooth type (back of tooth row)	M, m
Distal	Far from body center / mouth	dist.
Mesial	Close to the mouth	
Proximal	Close to body center	prox.

Table 2.1: Terminology related to mammal teeth with corresponding shorthands

Jaw	Line Notation	Sub/Superscript Notation	Digital Notation
Upper	M^1	m^1	M1
Lower	$M_{\bar{1}}$	m_1	m1

Table 2.2: Dental marking styles, Example: first molar. Line notation displayed in common style combining sub- and superscripts.

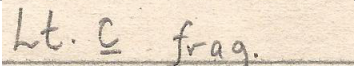
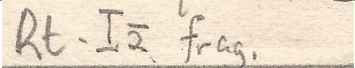
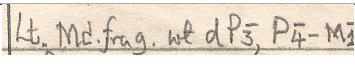
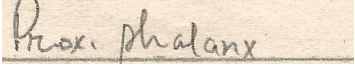
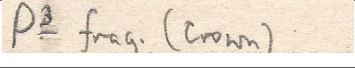

Input Image	Label
	Lt. \underline{C} frag.
	Rt. $I\bar{2}$ frag.
	Lt. Md. frag. wt $dP\check{3}$, $P\check{4}$ - $M\check{3}$
	Prox. phalanx
	$P\hat{3}$ frag. (Crown)
	? $M\hat{x}$ frag.

Table 2.3: Samples of input images and their corresponding labels.

Data preprocessing

2.2 Figures

Figure 2.2 gives an example how to add figures to the document. Remember always to cite the figure in the main text. There are many ways to cite, for example: University of Helsinki has a nice logo (see Fig. 2.2).



Figure 2.2: University of Helsinki flame-logo for Faculty of Science.

Table 2.4: Experimental results.

Koe	1	2	3
A	2.5	4.7	-11
B	8.0	-3.7	12.6
$A + B$	10.5	1.0	1.6

2.3 Tables

Table 2.4 gives an example how to report experimental results. Remember always to cite the table in the main text. There are many ways to cite, for example: The results are as expected (see Table 2.4).

3. Citations

3.1 Citations to literature

References are listed in a separate .bib-file. In this case it is named `bibliography.bib` with the following content:

```
@article{einstein,
  author =      "Albert Einstein",
  title =      "{Zur Elektrodynamik bewegter K{\\"o}rper}. ({German})
    [{On} the electrodynamics of moving bodies]",
  journal =     "Annalen der Physik",
  volume =     "322",
  number =     "10",
  pages =      "891--921",
  year =       "1905",
  DOI =        "http://dx.doi.org/10.1002/andp.19053221004"
}

@book{latexcompanion,
  author      = "Michel Goossens and Frank Mittelbach and Alexander Samarin",
  title       = "The \LaTeX\ Companion",
  year        = "1993",
  publisher   = "Addison-Wesley",
  address     = "Reading, Massachusetts"
}

@misc{knuthwebsite,
  author      = "Donald Knuth",
  title       = "Knuth: Computers and Typesetting",
  url         = "http://www-cs-faculty.stanford.edu/%7Eknuth/abcde.html"
}
```

In the last reference url field the code %7E will translate into ~ once clicked in the final pdf.

References are created using command `\cite{einstein}`, showing as [1]. Other examples: [2, 3].

Citations should be arranged in alphabetical order by author, using the default style `abbrv`.

3.2 Crossreferences

Appendix A on page 15 contains a code example.

4. From tex to pdf

In Linux, run `pdflatex filename.tex` and `bibtex filename` repeatedly until no more warnings are shown. You should use `pdflatex` when compiling your document.

5. Conclusions

It is good to conclude with some insightful discussion.

Bibliography

- [1] A. Einstein. Zur Elektrodynamik bewegter Körper. (German) [On the electrodynamics of moving bodies]. *Annalen der Physik*, 322(10):891–921, 1905.
- [2] M. Goossens, F. Mittelbach, and A. Samarin. *The L^AT_EX Companion*. Addison-Wesley, Reading, Massachusetts, 1993.
- [3] S. Hillson. *Tooth Form in Mammals*, page 7â145. Cambridge Manuals in Archaeology. Cambridge University Press, 2005.
- [4] D. Knuth. Knuth: Computers and typesetting, circa 2000. <http://www-cs-faculty.stanford.edu/%7Eknuth/abcde.html>, Accessed on 6th March 2018.

Appendix A. Code example

Program code can be added as appendix:

```
#!/bin/bash
text="Hello World!"
echo $text
```