

# Your Thesis is Software

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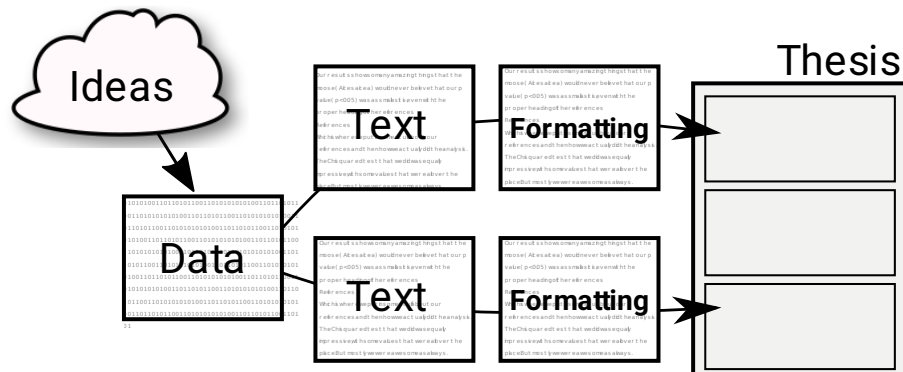
23/10/2020

## What is a Thesis?

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### A Thesis is

ideas + data + text + formatting



### A Thesis is Ideas

**IDEAS** + data + text + formatting

- We have expectations and hypotheses that we aim to test
  - Our project design is based on assumptions
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### A Thesis is Data

ideas + **DATA** + text + formatting

- Data is the product of experimental design and has constraints

- Data collection and processing is part of a workflow
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## A Thesis is Text

ideas + data + **TEXT** + formatting

- Text depends on results from analysis
  - Text is structured, ordered and order has meaning
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## A Thesis is Formatting

ideas + data + text + **FORMATTING**

- Formatting transforms text and gives meaning
  - Formatting makes it all look pretty
  - Your thesis office will not accept a thesis with the wrong formatting
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## Is A Thesis Like Software?

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### Software Is

- ideas (usually sus)
  - data (data)
  - text (code)
  - formatting (styling)
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## What can we learn from Software Development

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## What can we learn from Software Development

- Working on *Features*
  - Testing *Assumptions*
  - Building *Workflows*
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## Software Development: FEATURES

- Working on *Features*
    - Thesis elements are “units” (a chapter, a statistical test, a graph, a table)
    - A unit can be its own file
    - A unit has expected *inputs* & *outputs*
    - A unit can have versions
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## Software Development: ASSUMPTIONS

- Testing *Assumptions*
    - We know things about our data ( $n = ??$ , all values are positive)
    - We write things about our results ( $p < 0.5$ )
    - Results and data might change as *features* change
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## Software Development: WORKFLOWS

- Building *Workflows*
    - The final thesis is the sum of units
    - Writing units that “just work” takes planning
    - Writing units that “just work” makes changing them easier
    - Writing units that “just work” makes fixing them easier
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## Your Thesis is Software

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## This Workshop

- An introduction to software tools & concepts
  - A resource & community for your ongoing work
  - A tool to help you re-think your work going forward
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## Key Learning Points

- An introduction to `git` as a tool for version control
- An introduction to markdown (and RMarkdown)
- Data access and processing tricks in documents

- A collection of tips & tricks