Making research reproducible using literate programming

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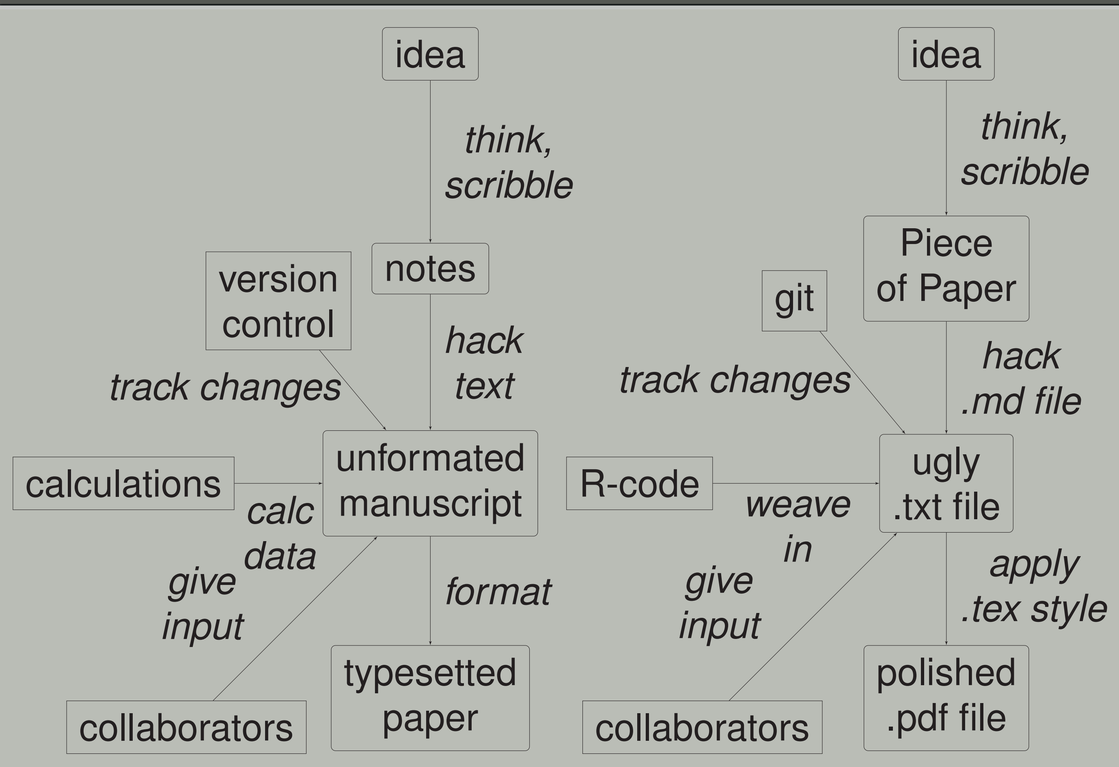
Reproducibility: What and why?

There is an increasing concern about the reliability of research results [**?**]. Precisely, it has been found that many published results cannot be replicated [**?**]. In parts, this can be due to the fact that it is often hardly possible for independent researchers to confirm the results of a research paper. Thus, making research more reproducible seems a pressing need [**?**]. Here, we present some "recipe" for making (your) research paper more reproducible using literate programming. Literate programming refers to weaving programming code (ie., statistical calculations) with the paper text.

Workflow for reproducible paper writing



The *diagram* shows the workflow *in theory*. The *right* diagram exemplifies useful tools for each step.

What makes the researcher happy

	Word	Latex	Markdown	WebApps
easy	● ● ●	●	●●	●●
beautiful	●	● ● ●	● ● ●	●●
literal	●	● ● ●	● ● ●	●
readable	●	●●	● ● ●	● ● ●
versionized	●	● ● ●	● ● ●	● ● ●
citable	● ● ●	● ● ●	● ● ●	● ● ●
flexible	● ● ●	●●	●	●●
Σ	13	17	18	16

This table compares some (subjective) criteria of what a researcher needs for writing a paper in a reproducible and efficient way. Note: *Word* refers not only to MS Word, but to similar WYSIWYG text processors as well. *WebApps* refer to scholarly writing tools such as *Authorea*. *Markdown* refers to the *pandoc* dialect and extensions of markdown.

Software tools for reproducible writing

Name	Description
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Introduction

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