LaTeX for Humans

Sukhjit Singh Sehra

Sabudh Foundation

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Contents

Introduction

Birth of LaTeX

Steps of Data Science Report

- Choose a problem
- Review the literature
- State the research question or hypothesis
- Select a sample
- Select a data collection method
- Code the data
- Analyze and interpret the data
- Write the Report

No Discussion on

How to Choose Problem

Every step is important in Data Science Project.

But Need to Focus on

How to communicate the results

via Good Report?

Your report is Conflation of

Research Findings

+

Typesetting.

Research Findings

- It is the composition of the text the actual choice of **words to express one's ideas and his findings**.
- The logical structuring of the text. It includes matters such as:
  * The division of the text into paragraphs.
  * Sections or chapters.
  * The choice of whether certain material will appear as footnotes or in the main text.
  * The addition of special emphasis to certain portions of the text and so on ...

What is typesetting

This refers to matters such as the choice of the **font family** in which the text is to be printed, and the way in which structural elements will be visually represented.

- Selection of type face.
- Should section headings be in bold face or small capitals?
- Should they be flush left or centered? Should the text be justified or not?
- Should the notes appear at the foot of the page or at the end?
- Should the text be set in one column or two? And so on.

Job of typesetter Includes

- A selection of appropriate fonts in different sizes and styles.
- Paragraph and character styles, assigning uniform values to text (font, size, colour, alignment, etc.) that can be globally changed in an instant.
- Hyphenation, character spacing (kerning) and line spacing (leading), allowing fine adjustments to how much space an amount of text actually fills.
- Much more (e.g. alignment and rotation, linking to external files, layering, use of colour, etc.).

Pre-Digital era Type Setting

Manual typesetting

Hot metal typesetting

Photo typesetting

Digital era

SCRIPT variants

SGML and XML systems

Troff and successors

TEX and LATEX

But unfortunately most of today's technical report writer and self publish houses uses Microsoft Word or another word processing program instead of type setting software.

Which is not a typical Typesetting Software

Problem's with Word Processor

- They are direct descendent's of typewriters, not typesetting systems.
- They were originally meant to mimic the "look and feel" of the familiar typewriter.
- The original word processors typed with mono-spaced fonts—where each letter or number or punctuation takes up exactly the same amount of space

Most widely used Word Processing Sofware

Free and Open Source

Libre Office, NeoOffice, KOffice

Commercial Software

Microsoft Word, Pages

Most widely used Type Setting Sofware

Free and Open Source

LaTeX, Scribus, Laidout

Commercial Software

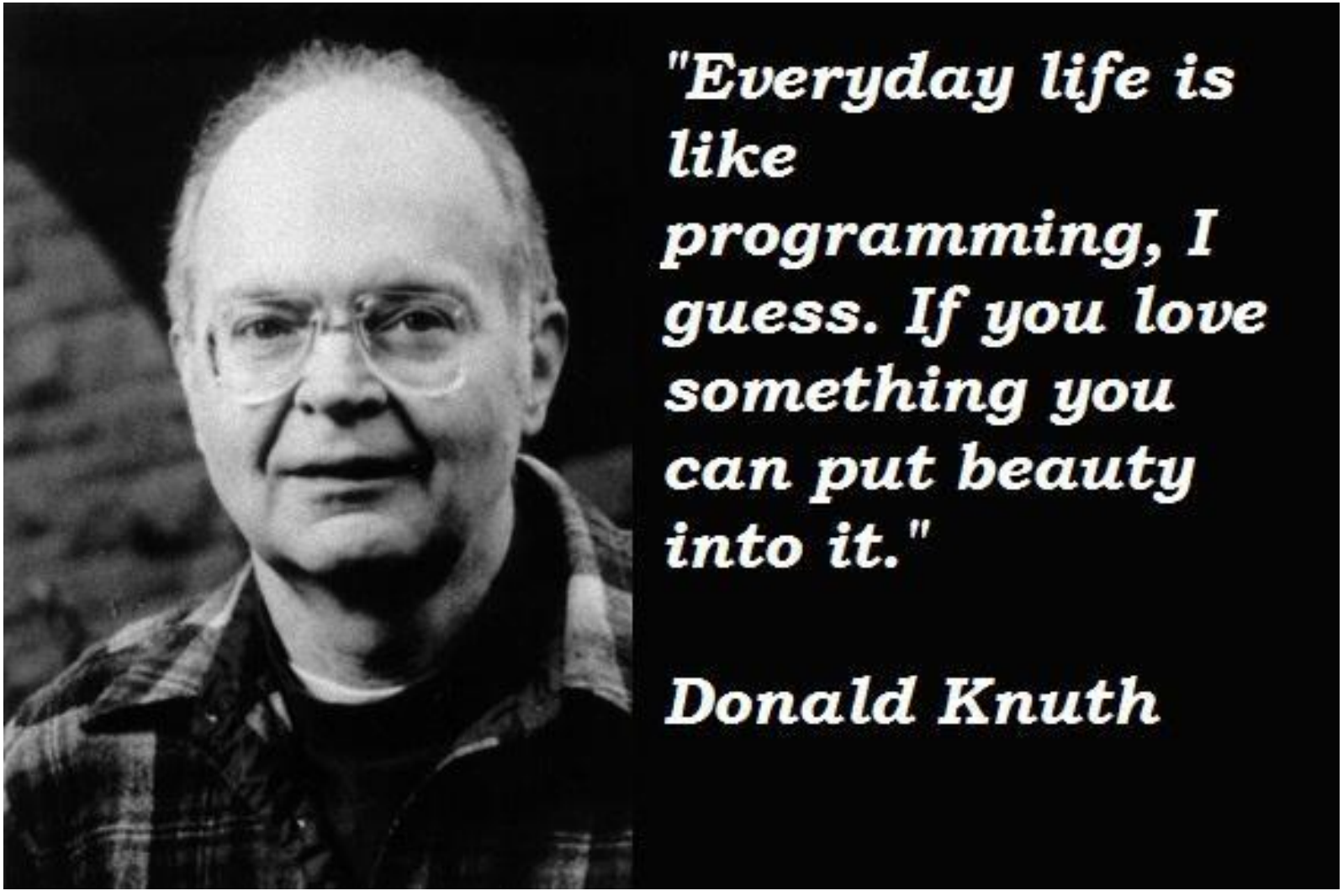
Adobe Indesign, QuarkXPress, iStudio Publisher

What is Good about MS Word

- Your grandmother/ Kids can probably use it....
- You can instantly see what the final document is going to look like. You don't have to **Process** it first.
- It's easy to quickly throw together trivial documents and make them look approximately how you want.
- It has a spell-checker!
- It's trivial to paste an Excel worksheet or chart into a document, or indeed to insert lots of other external content.

Disadvantages of MS Word

- Final output looks ugly.
- Doesn't handle large documents well.
- Virtually impossible to separate content from style, or to change styles without manually applying them to thousands of pages one at a time by hand.
- Equations are just painful.
- You dont have true version control system, But still can manage with options.



Donald Ervin Knuth is an American computer scientist, mathematician, and Professor emeritus at **Stanford University**.

History Contd ...

When the first volume of Donald Knuth's The Art of Computer Programming was published in 1969, it was typeset using hot metal type set by a Monotype Corporation typecaster with a hot metal typesetting machine produced a "good classic style" appreciated by Knuth.
During the second edition, in 1976, the whole book had to be typeset again because the Monotype technology had been largely replaced by photographic techniques, and the original fonts were no longer available.
Knuth received the galley proofs of the new book on 30 March 1977, he found them **awful**.

History Contd ...

Around that time, Knuth saw for the first time the output of a high-quality digital typesetting system, and became interested in digital typography.
The disappointing galley proofs gave him the final motivation to solve the problem at hand once and for all by designing his own typesetting system.
In 1977, he wrote a memo to himself describing the basic features of TeX.

> *Ultimately TEX incepted and in 1985 by Leslie Lamport, simplify Tex and make is LATEX and is now being maintained and developed by the LATEX3 Project.*

What is good about LaTeX?

- Superior typographic quality.
- Output device independence.
- Compatibility with revision control.
- Portability.
- Document longevity.
- Macros and other programmatic features.
- Mathematical typesetting. Typesetting mathematics is why TeX was first created, and LaTeX- continues to excel at this task.
- Clearly separate the content from the format of your document.

What is bad about LaTeX?

- More moving parts.
- Difficulty knowing/remembering markup commands.
- Previewing delay.
- Possibility of syntax errors.
- Adding new fonts.
- Lack of support for newspaper-style continued columns.

What is LaTeX

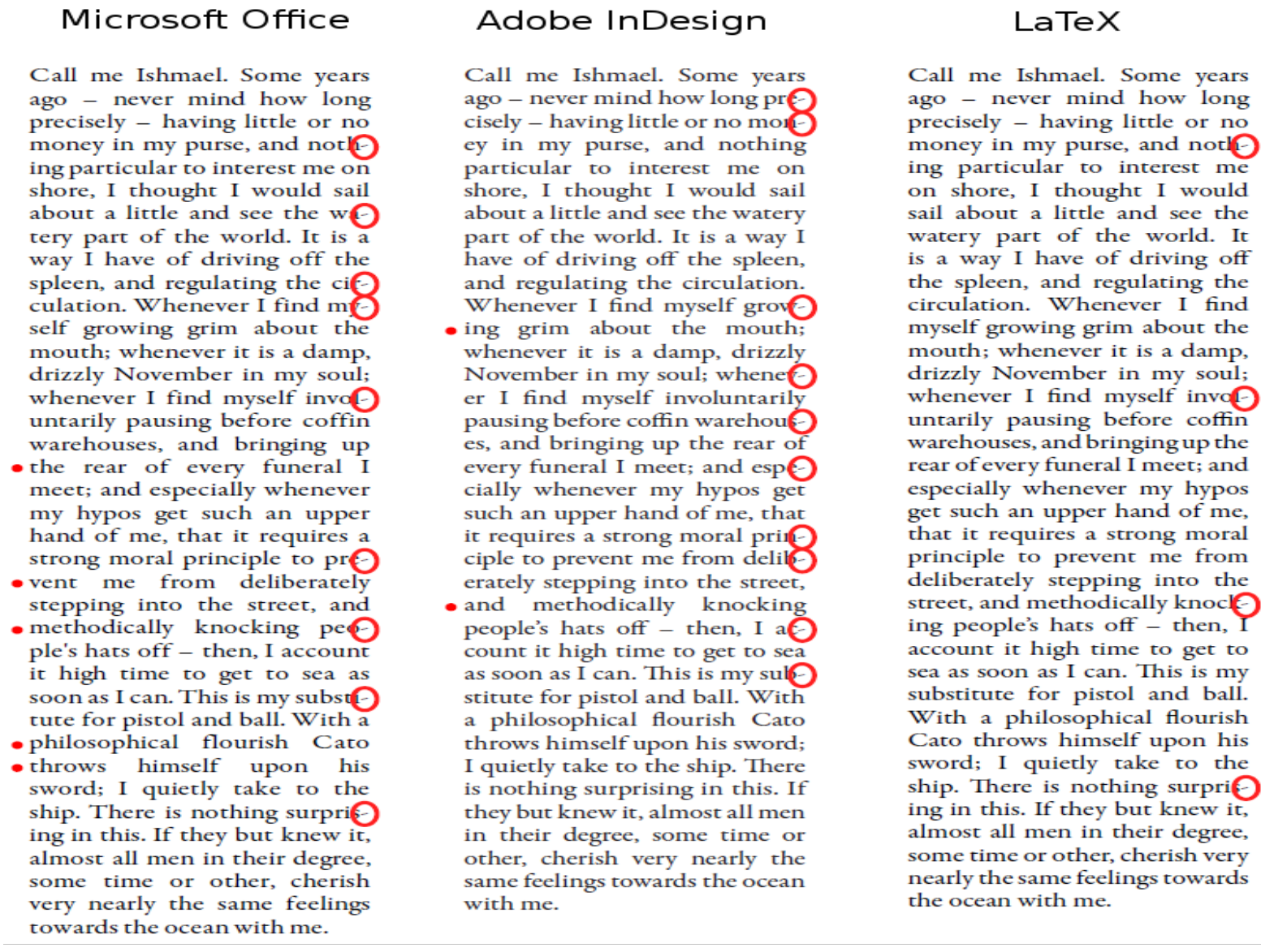
- Separation of content and style
- Portability
- Flexibility
- Control
- Quality
- Output
- Scalability
- Stability
- Cost
- BiblioGraphy Support

Comparison Test of Word and LaTeX

Text processors work according to the principle 'what you see is what you get' (WYSIWYG). This offers advantages, but when working on large documents, it is needlessly complex and time-consuming.
LaTeX, on the contrary, employs plain text enriched by special codes that clarify the structure and lay-out, which LaTeX translates to a completely typeset pdf document.
On Following Parameters the Word and LaTeX would be compared:

- Justification and Hyphenation
- Ligatures
- Real smallcaps
- Kerning

Justification and Hyphenation



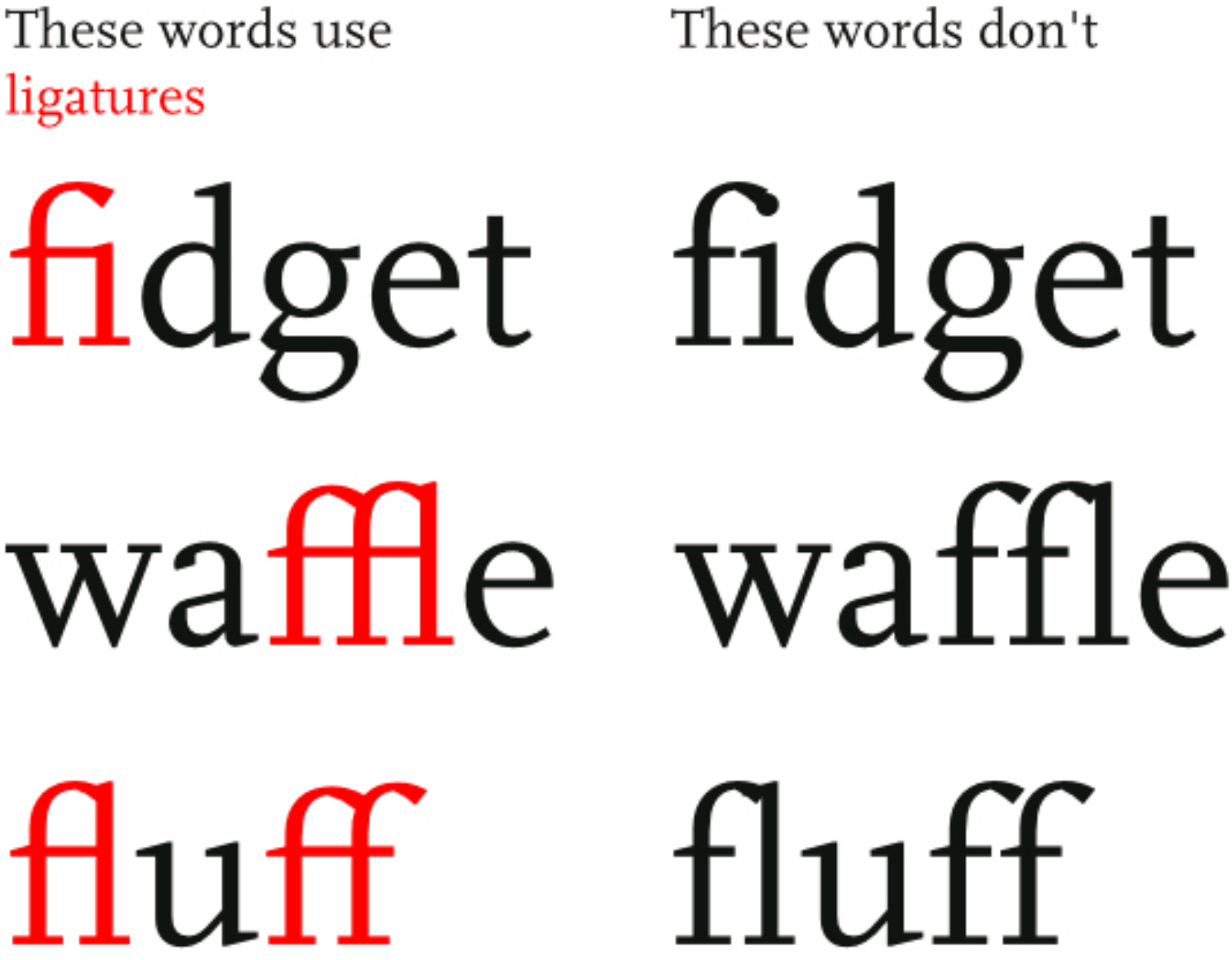
Results

Hyphenation and inter-word spacing statistics

	Word	InDesign	pdf-LaTeX
Number of hyphenations	9	10	4
SD of IWS (pt)	2.26	1.94	1.42
Maximum IWS (pt)	14.4	13.2	9.0
Number of lines with IWS > 9 pt	5	2	0

SD: standard deviation; IWS: inter-word spacing

Ligatures

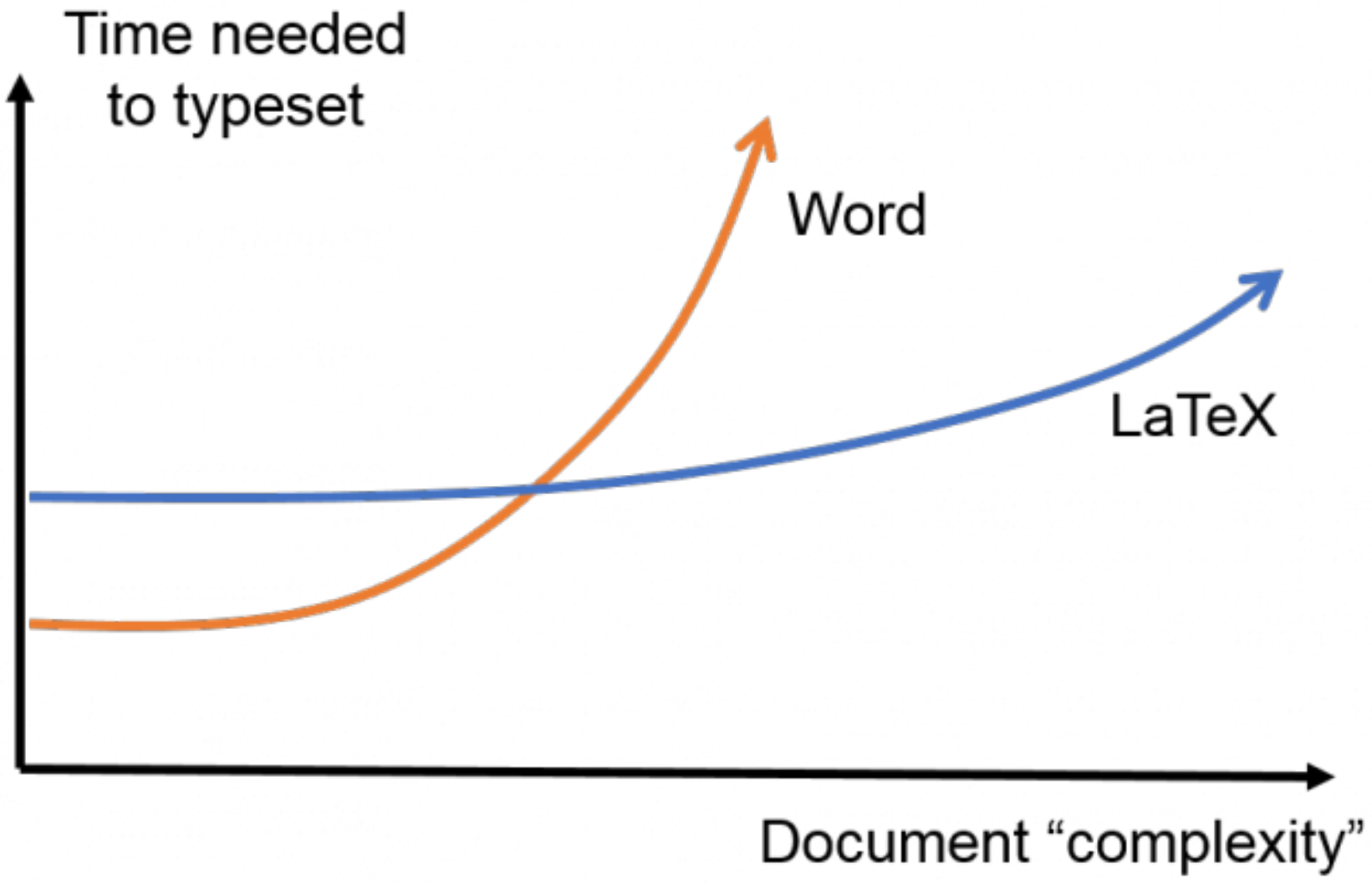

These words use
ligatures
fidget
waffle
fluff
These words don't
fidget
waffle
fluff

Ligatures

Affordable AVAST firewall
Feline Table Latex

Affordable AVAST firewall
Feline Table Word Processor

The learning curve



C'mon, be fair!

To be fair to compare LaTeX and Word, because they are different types of system, which are suited to different jobs

1. Word can be extended using its in-built scripting language.
2. Word has styles that can ensure manageable and consistent presentation.
3. Advantage of Word's GUI which is good for beginners.
4. Front-end to LaTeX is also available. Lyx they are environments that allow a more visual approach to your content, which is handy for producing complex equations, for example, but will pass your content to LaTeX for producing the final document.
5. Use LaTeX if your document is **Large** and you need **Beautiful** output file

But you Don't need to get tense

You build models and collect your results

Template of Report would be available for you!!

Learn LaTeX

Spread its Joy!!