



New Clay

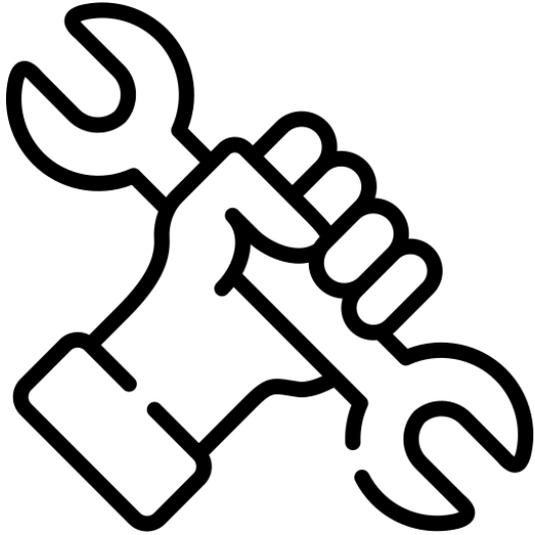
A deep dive in PDF possibilities



DISCLAIMER

- There is no such thing as a **PDF**, rather PDF is a collection of ISO specs. Each spec has its own quirks and strengths. The details are (for the most part) irrelevant for the purposes of this talk.
- Some things have (purposefully) been represented more straightforward than they are in reality.





1. Deep Dive in PDF

TECHNICAL SPEC (sort of)

- **primitive** types: string, bool, numbers, name
- **collection** types: arrays, dictionaries
- binary data: **streams** (halfway between a blob and dictionary)



CROSS REFERENCE TABLE

- usually at the back of the PDF
- maps object numbers to byte offset
- disrupt one byte in a PDF → PDF becomes unusable



TRAILER

- dictionary underneath the XREF table
- links to **/Info** (meta information of the PDF)
- links to **/Root** (visible content of the PDF)



ROOT

- links to **/Pages** dictionary
- also known as **/Catalog**



PAGES

- contains a list of **/Kids**, each of which represents a single page in the PDF



PAGE

- **/MediaBox**: how large is the page
- **/CropBox**: which part of the page is visible
- **/Resources**: links to fonts, images, etc
- **/Contents**: links to binary stream containing postfix operators



CONTENTS

- compressed stream of postfix operators
- sort of like a programming language
 - go to 10, 30
 - use font Helvetica, size 12
 - use the color black
 - draw the string “Hello World”



IMAGES, ETC?

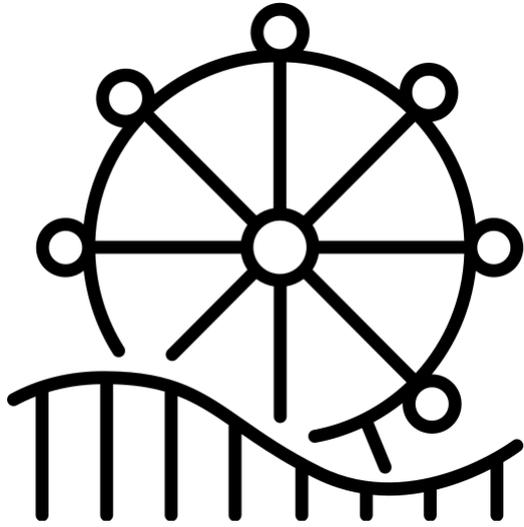
- binary data (streams)
- end up in /Resources of a /Page
- postfix syntax is roughly “insert image here”



TABLES, LISTS, ..

- a PDF has no idea which content belongs together
- postfix syntax would be (roughly):
 - draw a line at ..
 - set font to helvetica-bold (table heading)
 - draw text
 - etc





2. Fun Stuff



DISCLAIMER

- the features discussed here are:
 - usually not supported by every PDF library
 - usually not supported by every PDF viewer
 - sometimes not meant to be used in the way discussed here





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Description	This test creates a PDF with an empty Page, and several link annotations shaped like super-mario.



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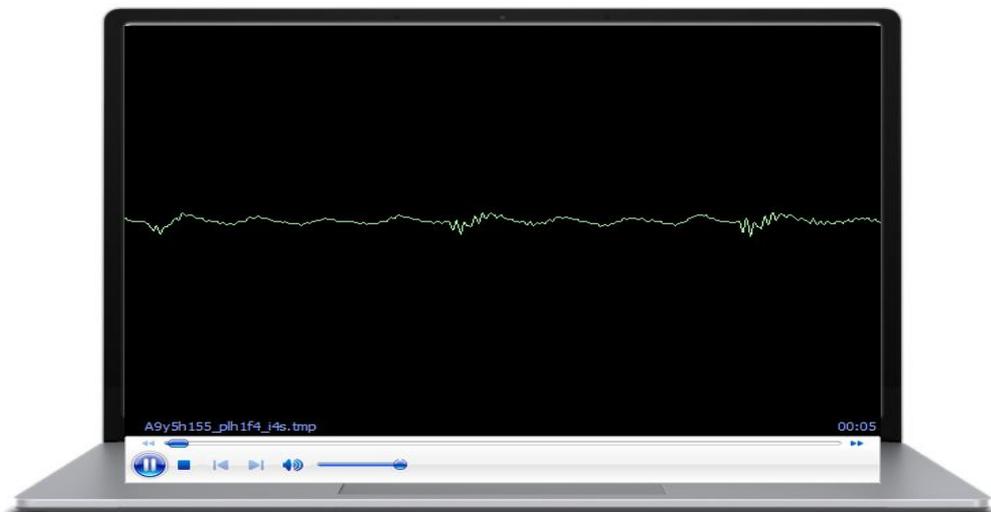
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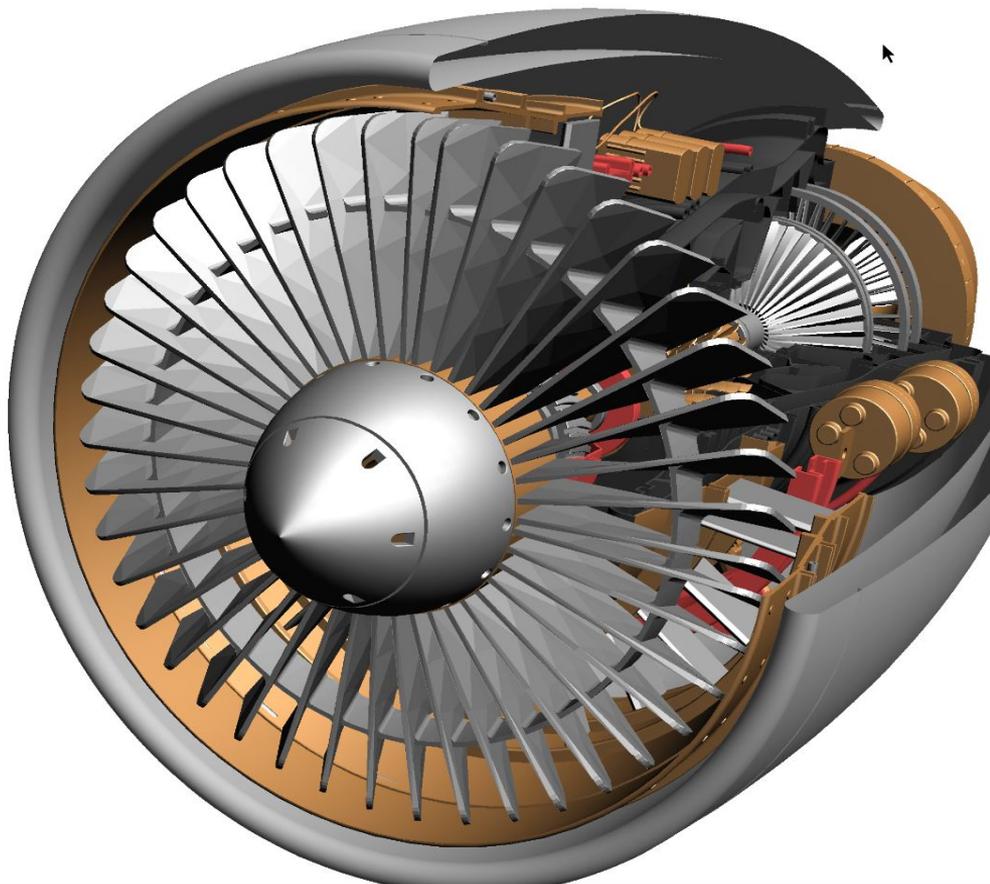
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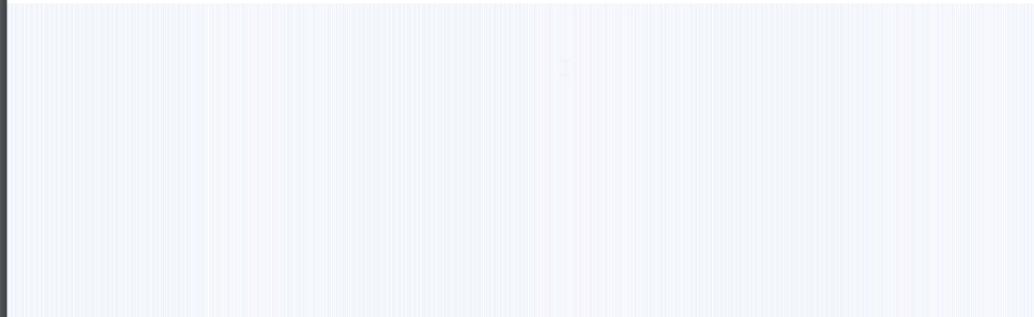
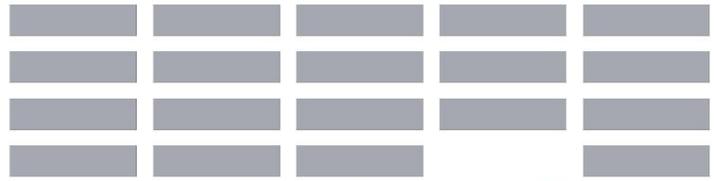
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4

Score: 1

Lives: 3





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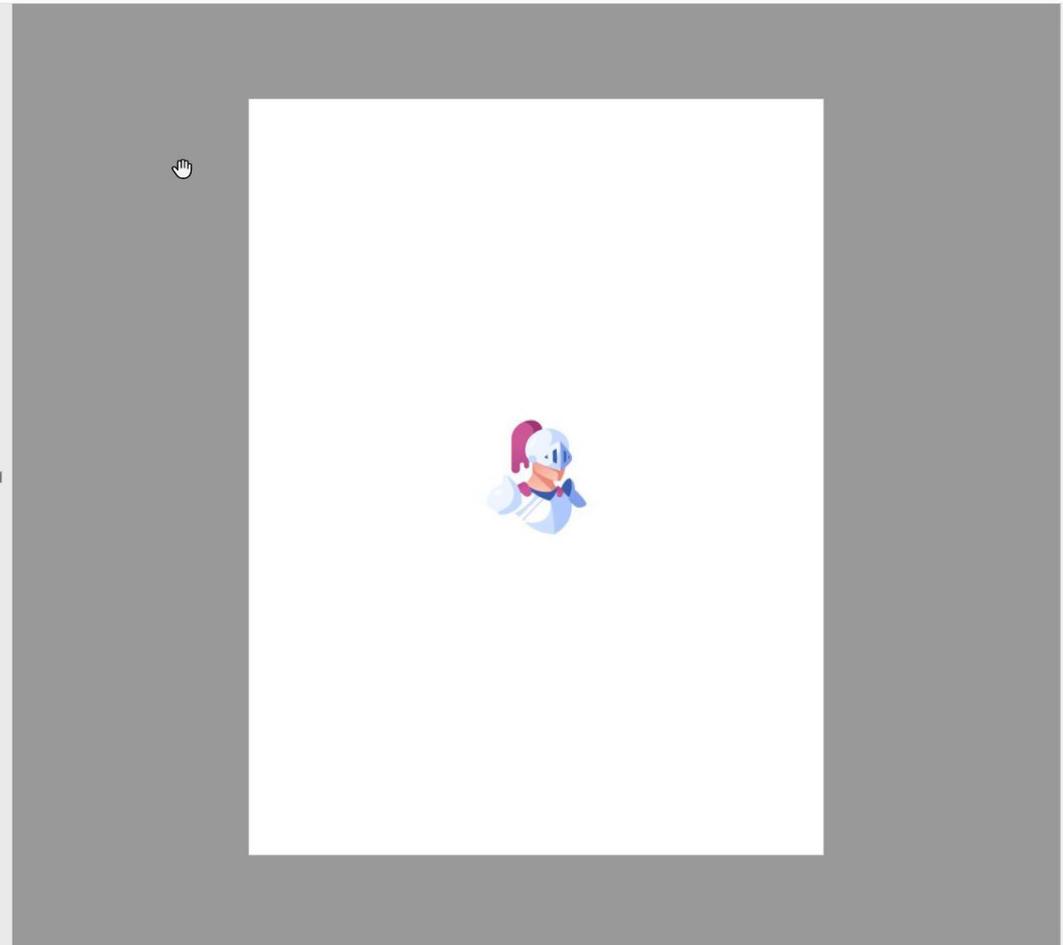
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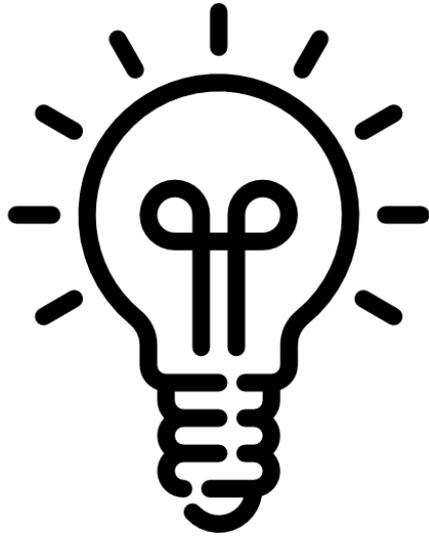
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3. Lessons Learned



- The PDF spec actually allows much more than what we see “in the wild”
 - we typically see text, images, maybe signatures
- PDF has put technical depth first
 - supporting all kinds of images
 - wide support of fonts
 - various compression methods



PDF THROUGH THE EYES OF THE USERS

- make tagged PDF the standard for outputting PDF documents
 - allows “reflow” for mobile devices
- use POS-tagging and NLP
 - named entity recognition could support the transgender community
 - link academic papers by the same person
 - better support for GDPR
- use facial recognition
 - support for GDPR



THE IMAGE PROBLEM

- PDF has a lousy public image.
 - typically people receive “unpleasant” documents in PDF
 - invoices, bills
 - hospital results
 - struggling with menu of a restaurant
- It should be easy to create beautiful PDF documents
- Tools to create PDFs should offer useful features
 - companies should support their users to make smarter choices
 - document the fun stuff, get people excited for PDF





Thank you

For more information:

-  joris1989BE
- github.com/jorisschellekens/borb