lab6

The Games Issue

Official sponsor of 6

ISSUE 4

Timeline of grid-based building games

- Microsoft Excel (1987)

- Sim City (1989)

- The Settlers (1993)

- Transport Tycoon (1994)

- Dungeon Keeper (1997)

- Dwarf Fortress (2006)

- Minecraft (2011)

- Factorio (2020)

Despite a nearly four decade long side-quest into **corporate applications**, the spreadsheet genre reached its apotheosis in 2020 with the official release of Factorio. In this style of game, players lay out objects in a grid (usually rectangular, but occasionally hexagonal), and may click on the objects to add **properties and values**. Complex calculations can be performed in both Factorio and Excel, although Excel's formula language arguably only achieved Turing-completeness with the addition of the LAMBDA function in 2021, which is quite late to the game. For this reason, serious **financial, medical or industrial applications** should probably stick to the more mature calculation capabilities found in Factorio circuits.

However, Factorio has until today lacked an important feature: **PDF Documents**. As proven conclusively in previous issues, PDF is the premier document format and the true final resting place for all content. This issue rectifies Factorio's hitherto defect by modding Factorio to add PDF and PDF/A documents as in-game items. Notably, the issue *is* the mod. Rename it to **pdf-documents_1.0.0.zip** and place it in your mods folder.

How does it work?

The primary use of the mod is to provide something to do with all the end-game wood that your bot army keeps stuffing into your inventory. Being sophisticated technological marvels, **PDF Documents** are crafted from planks of **wood**, and you can hold a thousand of them in a stack, making efficient use of your inventory slots. But beware! Plain PDF Documents have a 5% chance of creating an **Accessibility Violation**, which stack only one per slot! To reduce this risk, there is an alternative item: the **PDF/A Document**. As the more stable, enduring format, they require

hazard concrete in addition to wood, and in return have only a 0.05% chance of creating an Accessibility Violation.
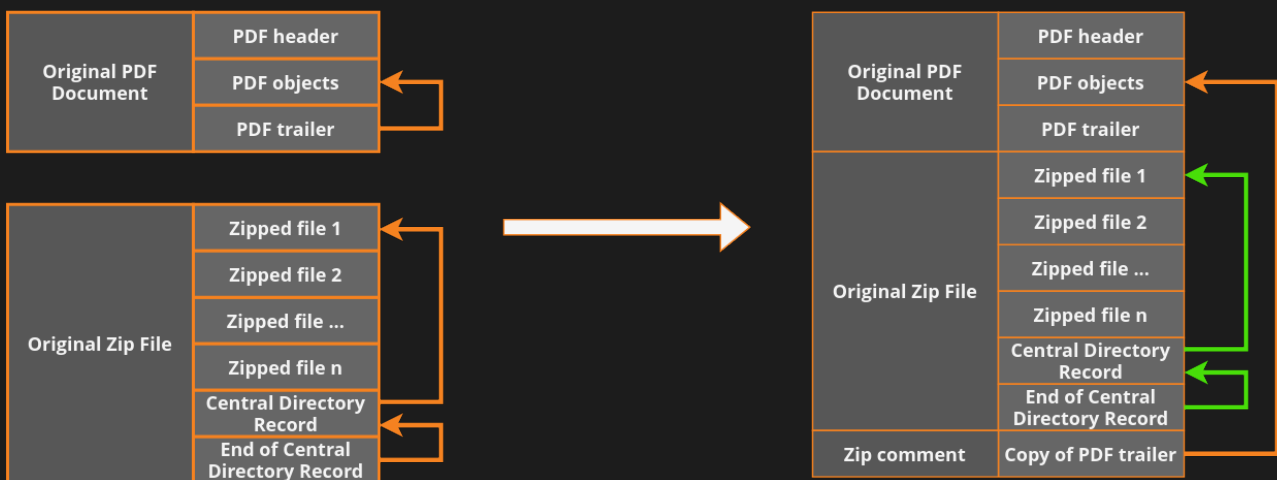
Factorio and PDF, finally together.

No, how does this file work?

You are reading a valid **PDF/A document** which is also a polyglot **zip file**. Since Factorio mods are simply zip files, Factorio will happily look inside to find the lua code and config that defines the new items.

The file is simultaneously a **valid** PDF/A document and a **valid** zip file; it does not rely on parser bugs.

PDF documents are accessed via a trailer record (`startxref`) that appears at the end of the file, and zip files happen to allow comments at the end, so the PDF trailer can be hidden in the comment. The PDF trailer and zip end-of-central-directory-record both contain the offsets of other structures within the file. We simply concatenate the zip file onto the end of the PDF file, append the PDF trailer, then find and **update every offset** within the zip file.

Why?

The nightmare dystopia that is a perfect society will have optimised away such silliness in its quest for efficiency. We can forestall hideous perfection and defend cultural richness by being purposefully pointless and inefficient.

Consider it your moral obligation to play this mod.

Resourceless Games

Sometimes you don't have dice, cards, or even a table.

Finger Parkour Fingers are legs in this acrobatic simulation. Single or multi-player. Suitable for silent and constrained environments.	**I Spy** The all-time classic. Any number of players, any place, any time.
Engaging Conversation Pick a topic. Take turns discussing. Try making points, and counterpoints. Up the excitement through speculation. First person to silence all other players wins.	**The Recursive Alphabet Game** Starting with A, take turns to think of an alphabet beginning with that letter with which you can play the recursive alphabet game. Hint: Armenian for Alphabet is այբուբեն!
Just A Story 9000 Each player takes turns saying one word of a story. No hesitation, deviation or repetition!	**License Plates: The Game** Players look out for funny license plates, where funny is defined as the first four characters being a base64 encoding of a rude word.
Hum That Tune One player hums a tune and the others take turns guessing the damages that would be awarded for performing it in a public place without a license.	**Pub Cricket** Every time you pass a cricket ground, do a Fermi estimate of how many pubs would be needed to serve a capacity crowd.
Zen 20 Questions The player clears their mind, then opponents ask regular yes/no questions. For each question, the player must refine an edge case that renders the question a false dichotomy. Get through 20 questions and the player becomes enlightened. Animal, vegetable or mineral? *Mu*.	**Violence** Compete in a battle of strength and agility to see who's top dog. Batter your opponents into submission. Fun for all the family, and also the supreme authority from which all other authorities are derived.

Tombstone of the Druid v0.7.1 changelog

- FIX: Character names using Shift JIS encoding no longer cause crashes when reaching the Celestial Runnels.

- IMPROVEMENT: Removed several optimisations and previous fixes in order to build character through artisanal hand-crafted imperfections, evoking a sense of nostalgia and connection to a bygone era.

- NEW FEATURE: Artificial atmospheric turbulence now usable as missile defence. The required angular momentum can be purchased for 79p per sack from aligned souks (84p from non-aligned).

- NEW FEATURE: Chipdoom Metal soundtrack by *Bristol Filtharmonic Gorchestra*

- EXPERIMENTAL FEATURE: Use hardware acceleration when detected.

- REGRESSION: Archivist class removed following out of court settlement with Jason Scott.

- CHORE: Migrated repo from git to Darcs.

- CHORE: Deprecate semantic versioning. Continued compliance is coincidental.

- FIX: "Druid" was spelled wrong throughout.

   Source tarballs and precompiled binaries can be downloaded from the Snap Store. Do NOT install on Oracle Linux without checking your license terms.

Longitudinal Storytime...

                upon

Back Issues

SHA-256 hashes of previous issues:

```
00c411fee9419cd861d9850dc56d53b7e6a211e90df9a1ca953e021b0cf31a56
0145df4ffcd382db238d1bc87c014013aa9cbc2298fe2a68fef09ca66cc99da6
0249500532346a546b8bb711755d9b1748d3a9593beeedba3b149554c58f6976
03dd114ba959819af097fe9800d31cd4cff581e69ab2b7161fc38ff1fc86a7e2
```

IPFS links respectively:

```
ipfs://QmTAQJro5RmXXpsPbXPZFSAMQZY8Lpw69EskGaJZXTBrWp

ipfs://QmZHFELyjXrMzmjDdxoMBZaf4sa6hrxJhAuzUpP6DDV1Xy

ipfs://Qmf1LPBTUunr57xPYbQSNXpnN5veQy9gJxr5G3K2bqSp1K

ipfs://QmdYUML4qjCMrh2q2qVNqzXB1VHwk3micP8eJfQUGBrdfU
```

Every issue of Lab 6 is made by machines, and the machines are made by hand. This document is certified as PDF/A-3b, does not process your personal data, and does not store any cookies anywhere. Its primary URL is https://www.lab6.com/4, but it can also be found at gemini://lab6.com/4. Its hexadecimal SHA-256 hash begins 0x04, identifying the issue number.

When this host goes down, you may be able to find mirrors using this handy random 128-bit integer that appears in every issue:

```
250e3f7d581acff115537ba38e89ad31
```

The Small Print

All content is licensed under…:

… except for the screenshot of Factorio, most of which is owned by Wube Software, except the PDF icons, which are courtesy of Wikimedia Commons, and are *not* owned by Adobe; no beef with Adobe, although they aren't returning calls enquiring why every XMP packet contains the GUID W5M0MpCehiHzreSzNTczkc9d and whether its base64 decoding of 5b933432909e8621f3ade4b335373391cf5d ("[.42...!....573..]") is numerologically significant, which it probably is, what with 42 being right there, and 573 being the Konami number; that's got to be meaningful, right? These things don't just get generated based on random numbers do they? Surely it all connects, back in the pre-history of computing, probably in the Bay Area, someone must have consulted *Brewer's Dictionary of Phrase and Fable*, maybe bounced a few ideas off their emotional support photocopier… at the *very least* the fact that it is valid base64 makes it look purposeful, and the ASCII decoding being bookended by matching square brackets is suggestive of syntax. C++ maybe, given it was 2001-era? Some kind of broken String access? Imagine the innumerable instances of this thing. It's not on! This 24 character string, or its 18 character decoding, sitting there as a short story in a reverse *Library of Babel*, where every possible photograph contains the same book. Borges would have known exactly what it was for. Where have you gone, Jorge Luis DiMaggio? He, the 22nd century comp-sci-fi futurist trapped in the 20th century, whose short fiction explores generative processes, identity, data lineage, virtualisation, and the numinosity of information in the abstract. He died in 1986, not long after *The Hacker Manifesto* was published in Phrack. Via unknowing spooky-collaboration-at-a-distance, with Vannevar Bush and Marshall McLuhan he prophesized and critiqued the coming network and its colourless bits, and he approached AI research homomorphically, by analogy, leaving the implementation details fully to the reader. As a translator, he was spiritual yin to Hofstadter's math-maximalist yang. Despite being subjected to many obituaries, he found employment as a Portuguese teacher to your correspondent, in Rio de Janeiro in the early 2000s. He passed through the death of the author (first channelling his essence into his work, and then the work recreating him through inspiration, like *Pierre Menard*'s Quixote meets the One Ring) and emerged as a native lusophone, Anglophilic to a tea. Packed somewhere, the undersigned still has a copy of *Naves Espacials: 2000 A 2100*, his translation of the first of Cowley's Terran Trade Authority series.

The old Argentine knew that writing as a discipline is bounded by the finite arrangements of the 10⁸⁰ particles offered by the observable universe, hence we merely mine and explore that space in the ultimate grid-based building game. Prior art to Greg Egan's *Permutation City* is *Tlön, Uqbar, Orbis Tertius*, a tale of Wikipedia's consensus reality gone wrong. He prefigured XKCD 859 in *The Garden of Forking Paths* by containing the story in an unclosed quotation. Set in World War I, this is a story about information leaks, covert channels, pre-agreed keys, ciphers, and the reconstruction of plaintext. Again the world was destroyed in *The Lottery in Babylon*, this time by gaming. First the gateway drug that created the 21st century's legion of programmers, then the end to which GPUs were initially put while being gently, then furiously, scaled – to finally become the heart of the giant inscrutable exercise in linear algebra that is currently driving 11-figure hype. Also in this story, Borges introduced the sacred latrine Qaphqa, a messaging system whereby spies post information into designated slots for later collection. The authors of Apache Kafka claim to have named it after Franz, but there's an intermediate origin story here.

Anyway, the point is, share and enjoy.

Comments

Send your feedback to comment@input.lab6.com and it may be published in the next issue.

You can also type your comment into the URL bar of your browser, immediately after the issue number, like this:

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https://www.lab6.com/4Your Comment Goes Here
gemini://lab6.com/4or here.
```

Full names and email addresses will not be published, unless requested.

Issue 1

2022-12-30 17:59:00 I am late to the party, but I found this issue to be very surprising and clever. Please continue your research into and experiments with PDFs and their possibilities, because I have rather hated them for their here-to-for poor implementation(s) and obtuseness for a very long time, and would welcome any improvements. -Lostnbronx

2023-02-03 19:57:32 you are literally apioforms

Special thank you to Louis and Martin for confirming the coverdisk defect that was fixed in issue 3.

Issue 2

2022-07-01 05:36:55 wow

Issue 3

2022-06-27 17:08:53 I'd recommend using warm water for the dough btw, yeast really appreciates it

2022-07-01 22:06:27 hello...goodbye

2022-09-02 23:47:44 Wow now that looks inspiring!

2022-11-22 03:22:45 I enjoyed the numbers

Tracking

OEIS entries	362,927
English Wikipedia entries (edits)	6,659,448 (1,152,003,835)
RC5-72 keys tested (% complete)	477,373,051,904,771,227,648 (10.109%)
Bitcoin blocks (hash)	791,171 00000000000000000000021b005455dd85388c977006aafed9d4e0364e52f17c8
XKCDs	2,779
IPv6 adoption	43.58%
Abe Vigoda Status Page Status	**Dead**, but not forgotten.
Largest Prime	$2^{82,589,933} - 1$
BTTF Movies	3
World population according to the CIA	7,979,261,010 (2023 est.) *
Latest stable Linux kernel	6.3.3
Color Names	3,431,633
Tilde Quilt entries	135
Count of University of Queensland pitch drops	9
Project Gutenberg eBooks	70,771
OCRemix Releases	4,453
Atmospheric CO2 ppm	423.28

STOP IT!

* Multiple sources attest to Earth's human population hitting 8 billion in November 2022, but the CIA estimate is a hair under. Lab6 is unaware of any reasons why the CIA should not be trusted.