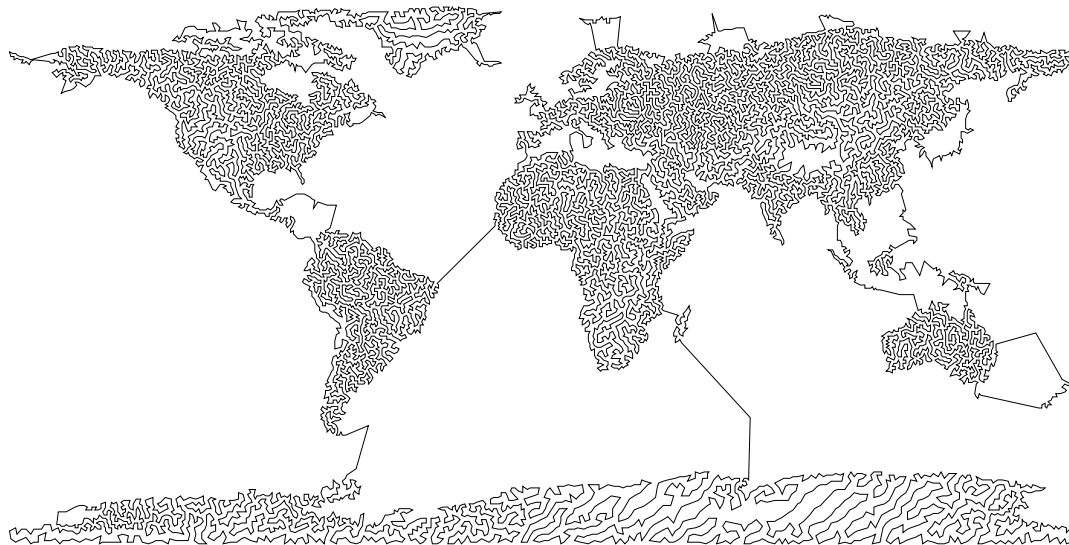# Getting inspired by open software for a web site: g3n.fyi

Edison

- Inventor of light bulb?

- No, it was invented by Heinrich Göbel

- Edison invented the screw mount (E10, E14, E27...)

- Quote: "Genius is one percent inspiration and ninety-nine percent perspiration."

3geonames.com

- Last recent FOSDEM:
  Talk about 3geonames.org

- Geoordinates mapping to sequence of three geonames and back

- Hashing to sequences of 11 characters

- Basically it converts 2D geocoordinates to 1D index

- In the talk, Hilbert curves were mentioned as conversation tool

- Well, this implementation is not yet at 100%

Analysing the Website

- Mapping works forward and backward

- There is an API

- Link to source code

- Map is there, but small

- User interface is improvable

Analysing the Code

- It works although not easily readable

- Tweakable:

  - Perl

  - Bit interleaving code is done the 'classic' way

  - Big integers although not necessary

  - Name table in code, DB or file would improve performance

  - Hashing character set consists of 26 letters and 10 digits

  - There should have been a Hilbert curve –
    Where is it?

Back to topic

- 3genoames.org is kinda proof of concept

- Works, code and UI are improvable

- No Hilbert curve code

- Maybe some 50% according to Edison scale

But... Hilbert Curve?!

- *This is the inspiration!*

- Connect 4 Hilbert curves to a Moore curve
  over the z=0 OSM tile

- Take several points in 2D geocoordinates

- Find distances to these points from its origin along the curve

- You get 1D coordinates – Now sort them

- Result is a fairly short round trip (TSP approximation)

- This algorithm is extremely fast allowing for frequent point changes

Dr. Thomas Bremer

Possible uses

- This technique has already been used in the past

- E.g: Optimizing meals on wheels delivery rides
  but with another space filling cuve (Sierpinski)

- Can be used for packet delivery, home care, geocaching, e-scooter recharging…

- Can also be used as starting point for improving optimization

- Obesrvation: 2-Opt algorithm gets *much* faster

And the perspiration?

- Not yet...

- Another proof of concept

- Web site should get more functionality
  like uploading coordinate lists

- At least on feature that is missing on many OSM sites
  can be found here:
  search using overpass to find features and get attributes comfortably

- Work on it is worthwhile

- There is commercial and private interest

There is more Inspiration!

- GUI is improvable

- Routing algorithms can be applied to results

- Routing algorithms can be used in optimization

That's it for today

- Try on 3gn.fyi ▣ or 3gn.eu ▣

- Thank you for your attention!

- Questions?