

Lecture 5

Files, modules

Programming in geoinformatics

Autumn 2017

EXERCISE 1

Load the file `lines.json` into Python and calculate their length using `lineTools.py` module we created in the previous seminar. Your new `script.py`, module `lineTools.py` and `lines.json` file all have to be saved in the same directory!

`lines.json`:

```
[[[199.47, 474.5], [381.91, 529.65], [480.38, 211.76], [460.02, 717.44], [372.44, 573.33], [823.79, 450.65], [883.74, 816.62], [339.27, 247.52]], [[67.59, 652.63], [404.5, 435.38], [666.35, 6.46], [898.26, 238.47], [298.32, 433.35], [526.2, 358.93], [769.27, 493.64], [921.44, 506.83], [210.55, 556.11], [934.96, 329.52], [778.76, 690.23], [711.17, 471.51]], [[283.6, 360.42], [727.24, 96.59]]]
```

Hint: use the function `loads(data)` from `json` module to get the lines from a string.

HOMWORK 1

Expanding on the exercise 1, create a new file `statistics.txt` with **statistics** for the lines in `lines.json`.

Use a format like this:

```
Line 1 - length: 6.67834; center: 6.7, 9.3; number of nodes: 8
Line 2 - length: 5.37627; center: 0.3, 6.4; number of nodes: 4
Line 3 - length: 2.82738; center: 7.1, -2.8; number of nodes: 2
```

Note: you should also add another function `pointCenter(points)` to the `lineTools.py` module. You can expand on the *Homework 1* from **Seminar 2**, but you need to use loops.

Note

I have also put an example script to study materials, which you can use to **open files** using **relative paths** – it should work straight away!

HOMWORK 2

Again, using the `lineTools.py` module, generate 10 **random lines** and save them as a new file (e.g. `lines_hw2.json`). The structure will be the same as in `lines.json` in exercise 1 and 2.

Note: try adjusting the `randomLine()` function to also **round** point coordinates to **2 decimal places**.

BONUS HOMEWORK

Following up on the previous exercise, format the 10 random lines as GeoJSON (see theory_05.pdf for specification and examples).

Example:

```
{ "type": "FeatureCollection",
  "features": [
    { "type": "Feature",
      "geometry": {
        "type": "LineString",
        "coordinates": [
          [199.47, 474.5], [381.91, 529.65], [480.38, 211.76], [460.02, 717.44], [372.44,
            ↪ 573.33], [823.79, 450.65], [883.74, 816.62], [339.27, 247.52]
          ]
        }
      },
    {
      ... line 2 ...
    },
    ...
    {
      ... line10 ...
    }
  ]
}
```