Parallel organization

The project is structured so that most scripts (except one) are in sub-directories, like `analysis`, `build` and `maps`.

In progress stuff like `population` and `simulate` contain things that will eventually be similar.

The rest is utilities, in `myutil`, and `test`, which naturally holds the tests.

The database is at main level, it comes in in two sizes.

The average script starts like this:

```
import sys, os, subprocess
base = os.environ.get('covid_base')
sys.path.insert(0,base)
```

Thus, you must set `covid_base` correctly. Everything is specified as a path from `covid_base`.

I found myself repeatedly doing the same imports, so I just put them all in `do_imports.py` and then do:

```
import myutil.udb as udb
import myutil.udates as udates
import myutil.ufile as ufile
import myutil.ufmt as ufmt
import myutil.uinit as uinit
import myutil.ukeys as ukeys
import myutil.umath as umath
import myutil.ustrings as ustrings

conf = uinit.clargs()
mode = conf['mode']
```

Command line arguments

These can be viewed with `-h` or `--help` with any script.

Features that are currently supported are given by the `--help` flag:

```
> python scripts/one_state.py --help

flags
-h  --help    help
-n   <int>    display the last n values, default: 7
-N   <int>    display N rows of data: default: 50

-c  --delta   change or delta, display day over day rise
-d  --deaths  display deaths rather than cases (default)
-r  --rate    compute statistics
-s  --sort    (only if stats are asked for)

to do:
-u   <int>    data slice ends this many days before yesterday
-p  --pop     normalize to population

example:
python scripts/one_state.py  -n 10 -sdr

>
```

I did not use the built-in Python module for cli, but rolled my own, see `uinit.py`

The statistic is the slope of a linear regression, divided by the mean of the values.

So, for example, if a 10-day series goes smoothly from 100 to 110, then the slope is about 10/10 = 1 and the statistic is a bit less than 0.01. If the series goes from 1000 to 1100, then the slope is about 100/10 = 10, but the statistic is still approximately 0.01.

Approach

The idea for most scripts is to use the main part of the script to assemble the correct keys in order. This list is then passed to `ufmt.fmt` along with the `conf` dictionary.

All the formatting happens in `ufmt`.

The code about keys does not know which database we're using. I found that too complicated to maintain since I added the option of building a `max` database. So now the database is passed to the `ukeys` routines as an argument.

Examples (as of 2020-06-29)

This version of the database is 2020-06-01 to 2020-06-28, updated this morning.

From the `analysis` directory:

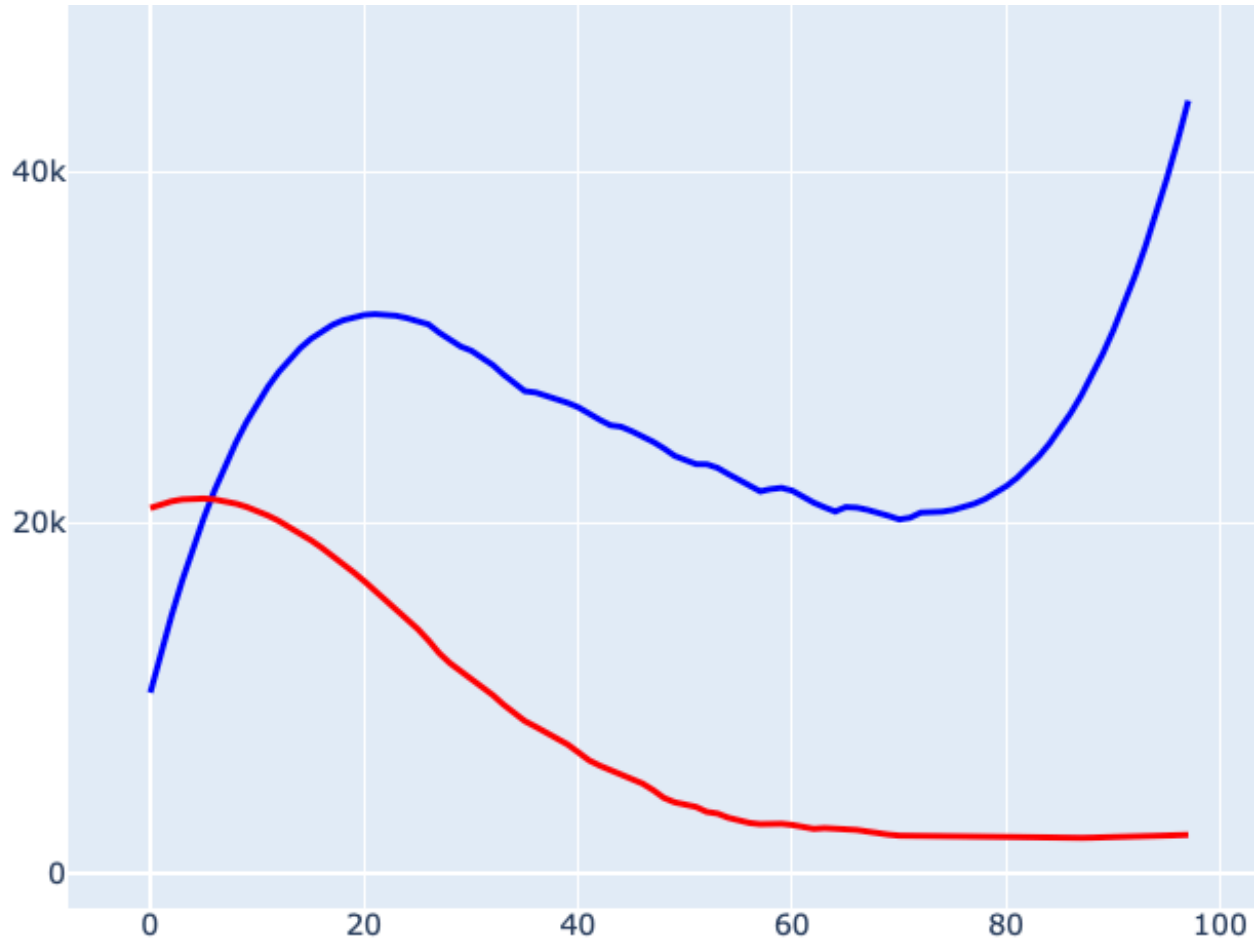
```
> python one_state.py SC -rs -n 3 -N 5
            06/26 06/27 06/28  stats
Bamberg        83    84    91  0.047
Anderson      525   552   563  0.035
Aiken         325   335   345  0.03
Abbeville     100   103   103  0.015
Allendale      47    48    48  0.01
total        1080  1122  1150  0.031
>
```

and

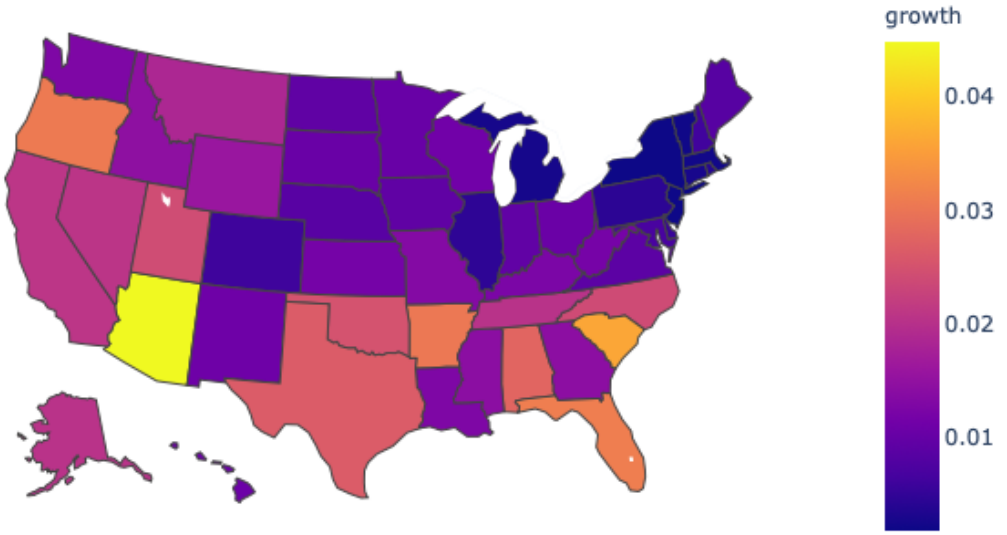
```
> python country.py Italy -n 3
                               06/26  06/27  06/28
Abruzzo, Italy                  3285   3285   3286
Basilicata, Italy                401    401    401
Calabria, Italy                 1178   1179   1180
Campania, Italy                 4665   4665   4665
Emilia-Romagna, Italy          28393  28435  28456
Friuli Venezia Giulia, Italy    3307   3307   3308
Lazio, Italy                    8064   8082   8096
Liguria, Italy                  9958   9963   9967
Lombardia, Italy               93587  93664  93761
Marche, Italy                   6783   6785   6785
Molise, Italy                    445    445    445
P.A. Bolzano, Italy             2634   2636   2637
P.A. Trento, Italy              4859   4860   4863
Piemonte, Italy                31311  31322  31336
Puglia, Italy                   4531   4531   4531
Sardegna, Italy                 1362   1363   1364
Sicilia, Italy                  3076   3077   3077
Toscana, Italy                 10226  10238  10243
Umbria, Italy                   1440   1440   1440
Valle d'Aosta, Italy            1194   1194   1194
Veneto, Italy                  19262  19264  19275
total                         239961 240136 240310
```

Results from `plot_eu_us.py`

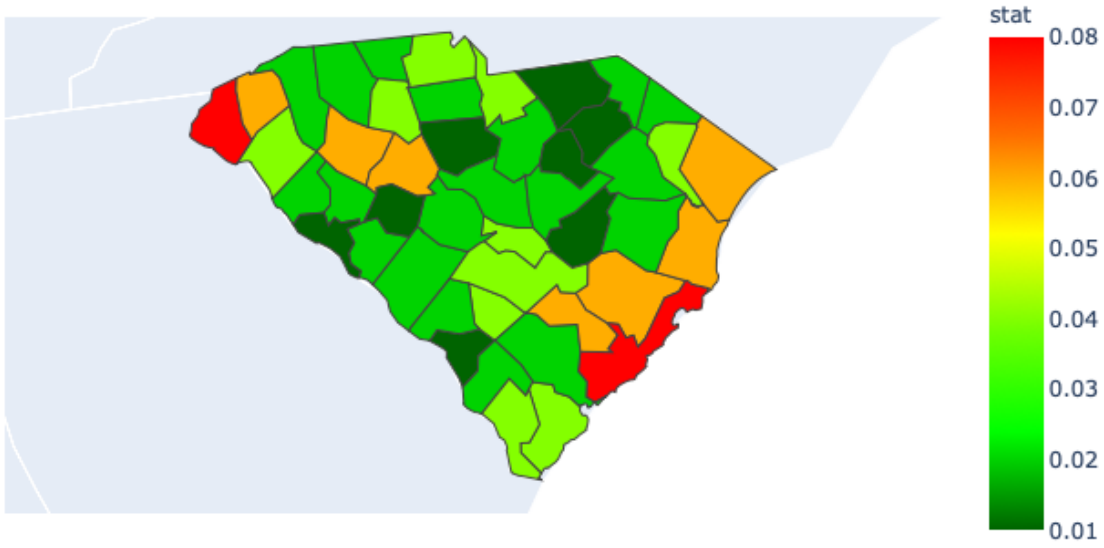
US v. EU new cases:



Choropleth 2020-06-19



and 2020-06-27



China new cases 2020-06-27.

```
python3 geo/one_state_map.py CA MN SC TX WY KY
```