Tudor ASD coding quiz

Read the following two problems and write the programs described, in Python.

- You may use any open source libraries and programs.
- You may refer to documentation.
- Spend up to two hours (honor system).
- If you don't complete both problems, submit a partial solution.

Please write production-quality code! We will evaluate your submission on code quality, clarity, and maintainability, in addition to correctness.

1. Download open interest

CFTC, a government agency that regulates trading in futures contracts, publishes a report about certain energy futures contracts at this URL:

https://www.cftc.gov/dea/futures/deanymesf.htm

You may need to set the HTTP User-Agent header to download this URL. The popular `requests` library does this automatically.

The report (which contains plain text embedded in an HTML document) contains several sections, one for each futures contract, that look similar to this:

```
GULF # 6 FUEL 3.0% SULFUR SWAP - NEW YORK MERCANTILE EXCHANGE        Code-02165A
FUTURES ONLY POSITIONS AS OF 04/17/18                              |
-------------------------------------------------------------------| NONREPORTABLE
      NON-COMMERCIAL      |   COMMERCIAL    |      TOTAL      |   POSITIONS
--------------------------|-----------------|-----------------|-----------------
  LONG  | SHORT  |SPREADS |  LONG  | SHORT  |  LONG  | SHORT  |  LONG  | SHORT
-------------------------------------------------------------------------------
(CONTRACTS OF 1,000 BARRELS)                         OPEN INTEREST:       49,429
COMMITMENTS
  13,579    1,297    3,678   32,102   44,427   49,359   49,402       70       27

CHANGES FROM 04/10/18 (CHANGE IN OPEN INTEREST:      1,610)
     161      274      109    1,366    1,243    1,636    1,626      -26      -16

PERCENT OF OPEN INTEREST FOR EACH CATEGORY OF TRADERS
    27.5      2.6      7.4     64.9     89.9     99.9     99.9      0.1      0.1

NUMBER OF TRADERS IN EACH CATEGORY (TOTAL TRADERS:       60)
      10        6        9       31       36       43       49
```

We'd like to extract the open interest (the number of futures contracts in existence) in the eighth line. For the Gulf #6 fuel contract above, the open interest in 49429.

Write a program that downloads the report at this URL and extracts the contract names (first line) and open interest values. The program should print out one line for each contract in CSV format.

For example:

```
$ ./get-open-interest
contract,open_interest
GULF # 6 FUEL 3.0% SULFUR SWAP,49429
EUR 3.5% FUEL OIL RTD CAL SWAP,11453
SING 380 FUEL OIL SWAP,7949
MINI EUR 3.5%FOIL RTD CAL SWAP,4170
...
```

2. File statistics by extension

Write a program that scans all files in a single directory. For each filename, it extracts the file extension, which is the portion of the name from the last period; for example, "myprogram.py" has file extension ".py". The program collects, by file extension, these three statistics:

- the *number* of files with each extension
- the *size in bytes of the largest file* with each extension
- the *total file size in bytes* of all files with each extension

The program should take a single directory path as its command line argument, or use the current working directory if none is provided.

For example:

```
$ ./ext-stats ~/src/myproject
.cfg          1       75       75
.csv          2       62      119
.dat         17        0        0
.desc         7     3078     5639
.html         4     6113    11228
.ipynb        3    12141    15289
.json        16     2316    14573
.md           9    10212    36040
.otq          2     8709    10734
.pickle       1     2577     2577
.py         298   107252  1761449
.txt          3     3768     4879
.xml          1    69946    69946
.yaml         2     2064     2146
```

Optionally, make the program scan all files *recursively* in a single directory, i.e. all files in the directory or any of its direct or indirect subdirectories.