Assignment #2

Due: Sunday March 5, 2023, 23:59.

Exercise 1 (25 points)

Write a Python Map-Reduce program (extending class MRJob) in file high_low_10.py to produce the ten largest and the ten lowest integers among those contained in file nums.txt.

Exercise 2 (25 points)

Write a Python Map-Reduce program (extending class MRJob) in file closest0.py to output the 10 numbers which are closest to 0 by absolute value among those contained in file nums.txt.

Exercise 3 (25 points)

Consider the file sprices.json. Write a Python Map-Reduce program (extending class MRJob) in file sprices.py that calculates

1. the maximum price per stock
2. the minimum price per stock
3. the average price per stock
4. the spread of prices (max_value – min_value) / average_price * 100 per stock

and prints these statistics with 2 decimal digits.

Exercise 4 (25 points)

Consider the file earthquakes.csv that contains historical data on earthquakes that struck Greece since 1/7/1965. Each row of the file contains data as follows:

- The datetime of the earthquake
- The latitude of the earthquake
- The longitude of the earthquake
- The depth of the earthquake
- The magnitude of the earthquake

Write a Python Map-Reduce program (extending class MRJob) in file earthquakes.py to output

1. The date, time, and magnitude of the ten most powerful earthquakes in Greece.
2. The number of earthquakes per year and month that struck Greece after 2010.

3. The minimum, maximum and average magnitude of earthquakes per year that struck Greece between 2010 and 2020 inclusive.
4. The five most powerful earthquakes that struck the Athens area (latitude between 37.5 and 39.0 and longitude between 23.35 and 23.55).

Submission

Put all .py files into a rar or zip compressed file with name <Lastname>_<Firstname>.rar or .zip (e.g., Nikolaou_Maria.zip) and submit it to Blackboard.

Penalties

Violation of any naming conventions will result into 20 points reduced from your grade.