

I used Python to write code for this part of the project. I imported the time package and set up the start time and end time. If the current time is still within the timeframe I initialized, my code will access the API and use BeautifulSoup to web scrape the information from the website. Since the data is always in the json format, I use json.loads to separate the three columns of data and insert them into a MySQL database by using mysql.connector. Since there might be internet connection delay or code runtime delay, I didn't hard code the sleep time between each API call to be 60 seconds, instead, I set the sleep\_time to be the max(0, 60 - iteration\_time). So that I can make sure that the API call will execute precisely once per minute. Finally, if the time has reached the end time that I set up before, the program will exit automatically.

Based on the data I collected from the API, I noticed that are trends among the three categories of data:

**Factor:**

it always equals to  $x^3$ , and x is the current minute in the hour.

For instance, the first observation is  $1 = 1^3$  at 2023-12-11 02:01:12, and then is  $8 = 2^3$  at 2023-12-11 02:02:12, then is  $27 = 3^3$  at 2023-12-11 02:03:12, then is  $64 = 4^3$  at 2023-12-11 02:04:12 ...

**Pi:**

It oscillates around the true value of pi (3.14159...) during an hour time interval. At the start of an hour, it begins with 4, then decreases to 3.017071817071818, then increases a little bit, then decreases a little bit... And as time goes by, it converges to the true value gradually.

**Time:**

This column of data just documents the timestamp of each time we accessed and scraped the data from API.