

Problemset

In the following exercises you will interact with a NASA API that provides access to data about asteroids and comets that closely approach planets of our solar system. The API documentation can be found [here](#).

Exercise 1

Query the Indicator API with default settings and study the response.

```
import requests
url = 'https://ssd-api.jpl.nasa.gov/cad.api'
response = requests.get(url)
data = response.json()
```

- How many objects are overall contained in the response?
- Store the actual data in a Pandas DataFrame. Each row should represent one object (e.g. asteroid or comet) and each column should represent one property of the object. Hint: the column names of your DataFrame can be derived from the API response.
- Study the default settings of the API in the documentation:
 1. Which date range is covered?
 2. Only objects close to which planet(s) are returned?
 3. What are the objects minimum and maximum distances? And in which unit are distances measured?
 4. How is the data sorted by default?

Exercise 2

Query the Indicator API with the following custom settings:

- How many objects will come close to the planet Earth between today and the end of 2024?
- How many objects will be less or equal than 1 lunar distances away from the Earth until the end of 2040?
- Query objects classified as PHA (Potentially Hazardous Asteroids) in the next five years, sort the objects according to their distances, and limit the results to the first 10 objects. Additionally, query also the objects' **diameter**, which the API does not return by default. Then store the data in a Pandas DataFrame. **Note:** Sort and limit the data directly in the API request.

Exercise 3

- Query the API for all potentially hazardous objects in the next 50 years.
- Store the response (not only the data, but the entire object) in a JSON file.
- Read in the data from the JSON file into a Python object (list of dictionaries)