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positional-iss

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Abstract

An containerized Flask webserver designed for querying ISS sightings and positions on February 13, 2022. Midterm project for COE332. R is used to produce documentation.

Keywords: positional-iss, Docker, Flask, Python3, R.

0.1. Implementation / Files

0.2. Input Data

- The application queries data from the National Aeronautics and Space Administration (NASA) public website, in particular ISS positional information via the **Public Distribution file** and regional sighting data for the Midwest via the **XMLsightingData_citiesUSA05** file.

Example input data is available at the above links.

1. API:

ENDPOINT: /

- Description: Get homepage HTML
- Parameters:
- N/A
- Responses:
- A 200 response will: Return homepage HTML
- Example: `curl -X GET http://0.0.0.0:5026/ -H "accept: application/json"`

ENDPOINT: /api/doc

- Description: Get API HTML

Parameters:

- N/A
- Responses:
- A 200 response will: Return API HTML
- Example: `curl -X GET http://0.0.0.0:5026/api/doc -H "accept: application/json"`

ENDPOINT: /api/save

- Description: Get API as rendered string
- Parameters:
- N/A
- Responses:
- A 200 response will: Return rendered API as string
- Example: `curl -X GET http://0.0.0.0:5026/api/save -H "accept: application/json"`

ENDPOINT: /country

- Description: Get all possible countries.
- Parameters:
- N/A
- Responses:
- A 200 response will: Return a list of countries.
- Example: `curl -X GET http://0.0.0.0:5026/country -H "accept: application/json"`
yields:

```
[
  "United_States"
],''
```

ENDPOINT: /country/{country}

- Description: Get data for a single country.

- Parameters:

- country : Value (name) of country to be queried. An example: United_States

- Responses:

- A 200 response will: Return all matching (queried country) sightings as json.

- Example: `'curl -X GET http://0.0.0.0:5026/country/United_States -H "accept: application/json"' yi`

```
[
  {
    "city": "Olathe",
    "country": "United_States",
    "duration_minutes": "6",
    "enters": "10" above "SSW",
    "exits": "10" above "ENE",
    "max_elevation": "28",
    "region": "Kansas",
    "sighting_date": "Thu Feb 17/06:13 AM",
    "spacecraft": "ISS",
    "utc_date": "Feb 17, 2022",
```

```

    "utc_offset": "-6.0",
    "utc_time": "12:13"
  },
  ...
  {
    "city": "Nantucket",
    "country": "United_States",
    "duration_minutes": "3",
    "enters": "19 above NNW",
    "exits": "10 above NNE",
    "max_elevation": "19",
    "region": "Massachusetts",
    "sighting_date": "Sat Feb 26/04:56 AM",
    "spacecraft": "ISS",
    "utc_date": "Feb 26, 2022",
    "utc_offset": "-5.0",
    "utc_time": "09:56"
  }
]` ``

```

ENDPOINT: /country/{country}/region

- Description: Get data for all regions of a certain country.
- Parameters:
 - country : Value (name) of country to be queried. An example: United_States
- Responses:
 - A 200 response will: Return all matching regions for the queried country as json.
- Example:


```
curl -X GET http://0.0.0.0:5026/country/United_States/region -H "accept: application/json"
```

 yields:

```

[
  "Kansas",
  "Kentucky",
  "Louisiana",
  "Maine",
  "Mariana_Islands",
  "Maryland",
  "Massachusetts"
]` ``

```

ENDPOINT: /country/{country}/region/{region}

- Description: Get all data for a specific region of a certain country.
- Parameters:
 - country : Value (name) of country to be queried. An example: United_States
 - region : Value (name) of region to be queried. An example: Kansas
- Responses:
 - A 200 response will: Return all matching results for the queried region as json.
- Example:

```
'curl -X GET http://0.0.0.0:5026/country/United_States/region/Kansas -H "accept: applica
```

```

[
  {
    "city":
    "country":
    "Olathe",
    "United_States",

```

```

    "duration_minutes": "6",
    "enters": "10 above SSW",
    "exits": "10 above ENE",
    "max_elevation": "28",
    "region": "Kansas",
    "sighting_date": "Thu Feb 17/06:13 AM",
    "spacecraft": "ISS",
    "utc_date": "Feb 17, 2022",
    "utc_offset": "-6.0",
    "utc_time": "12:13"
  },
  ...
  {
    "city": "Yates_Center",
    "country": "United_States",
    "duration_minutes": "1",
    "enters": "12 above N",
    "exits": "10 above N",
    "max_elevation": "12",
    "region": "Kansas",
    "sighting_date": "Sat Feb 26/05:29 AM",
    "spacecraft": "ISS",
    "utc_date": "Feb 26, 2022",
    "utc_offset": "-6.0",
    "utc_time": "11:29"
  }
]`

```

ENDPOINT: `/country/{country}/region/{region}/city`

- Description: Get all cities for a specific region of a certain country.
- Parameters:
 - country : Value (name) of country to be queried. An example: United_States
 - region : Value (name) of region to be queried. An example: Kansas
- Responses:
 - A 200 response will: Return all matching cities for the queried region and country as json.
- Example:


```
curl -X GET http://0.0.0.0:5026/country/United_States/region/Kansas/city -H "accept: application/json"
```

yields:

```

[
  "Olathe",
  "Osborne",
  "Oskaloosa",
  "Oswego",
  "Ottawa",
  "Paola",
  "Phillipsburg",
  "Pittsburg",
  "Pratt",
  "Russell",
  "Saint_Francis",

```

```

"Scott_City",
....
"Sublette",
"Syracuse",
"Tallgrass_Prairie_National_Preserve",
"Topeka",
"Tribune",
"Troy",
"Ulysses",
"WaKeeny",
"Washington",
"Wellington",
"Westmoreland",
"Wichita",
"Winfield",
"Yates_Center"
] , ' '

```

ENDPOINT: /country/{country}/region/{region}/city/{city}

- Description: Get all information for a specific city of a region of a certain country.

- Parameters:

- country : Value (name) of country to be queried. An example: United_States

- region : Value (name) of region to be queried. An example: Kansas

- city : Value (name) of city to be queried. An example: Wichita

- Responses:

- A 200 response will: Return all information for the queried city as json.

- Example: 'curl -X GET http://0.0.0.0:5026/country/United_States/region/Kansas/city/Wichita -H "a

```

[
{
  "city": "Wichita",
  "country": "United_States",
  "duration_minutes": "6",
  "enters": "10" above "S",
  "exits": "10" above "ENE",
  "max_elevation": "25",
  "region": "Kansas",
  "sighting_date": "Thu Feb 17/06:12 AM",
  "spacecraft": "ISS",
  "utc_date": "Feb 17, 2022",
  "utc_offset": "-6.0",
  "utc_time": "12:12"
},
....
{
  "city": "Wichita",
  "country": "United_States",
  "duration_minutes": "1",
  "enters": "12" above "N",
  "exits": "10" above "N",
  "max_elevation": "12",
  "region": "Kansas",
  "sighting_date": "Sat Feb 26/05:29 AM",
  "spacecraft": "ISS",
  "utc_date": "Feb 26, 2022",
  "utc_offset": "-6.0",

```

```

    "utc_time": "11:29"
  }
]` ``

```

ENDPOINT: /data

- Description: Updates the list of data dictionaries.
- Parameters:
- N/A
- Responses:
- A 201 response will: Updated data dictionary list.
- Example: `curl -X POST http://0.0.0.0:5026/data -H "accept: application/json"` yields:

```
"Data updated."` `` `
```

ENDPOINT: /epoch

- Description: Get all possible epochs.
- Parameters:
- N/A
- Responses:
- A 200 response will: Return a list of epochs.
- Example: `'curl -X GET http://0.0.0.0:5026/epoch -H "accept: application/json"'` yields:

```

[
  "2022-042T12:00:00.000Z",
  "2022-042T12:04:00.000Z",
  "2022-042T12:08:00.000Z",
  "2022-042T12:12:00.000Z",
  "2022-042T12:16:00.000Z",
  "2022-042T12:20:00.000Z",
  "2022-042T12:24:00.000Z",
  "2022-042T12:28:00.000Z",
  "2022-042T12:32:00.000Z",
  "2022-042T12:36:00.000Z",
  "2022-042T12:40:00.000Z",
  "2022-042T12:44:00.000Z",
  "2022-042T12:48:00.000Z",
  "2022-042T12:52:00.000Z",
  ...
  "2022-057T11:08:56.869Z",
  "2022-057T11:12:56.869Z",
  "2022-057T11:16:56.869Z",
  "2022-057T11:20:56.869Z",
  "2022-057T11:24:56.869Z",
  "2022-057T11:28:56.869Z",
  "2022-057T11:32:56.869Z",
  "2022-057T11:36:56.869Z",
  "2022-057T11:40:56.869Z",
  "2022-057T11:44:56.869Z",
  "2022-057T11:48:56.869Z",
  "2022-057T11:52:56.869Z",

```

```

“2022-057T11:56:56.869Z”,
“2022-057T12:00:00.000Z”
]``

```

ENDPOINT: /epoch/{name}

- Description: Get data for a single epoch.
- Parameters:
 - name : Value of epoch to be queried. An example: 2022-042T12:04:00.000Z
- Responses:
 - A 200 response will: Return epoch information for first matching epoch as json.
- Example:


```
curl -X GET http://0.0.0.0:5026/epoch/2022-042T12:04:00.000Z -H "accept: application/json"
```

 yields:


```
{
  "EPOCH": "2022-042T12:04:00.000Z",
  "X": {
    "#text": "-4483.2181885642003",
```

ENDPOINT: /pdf

- Description: Get writeup HTML
- Parameters:
 - N/A
- Responses:
 - A 200 response will: Return writeup HTML
- Example: `curl -X GET http://0.0.0.0:5026/pdf -H "accept: application/json"`