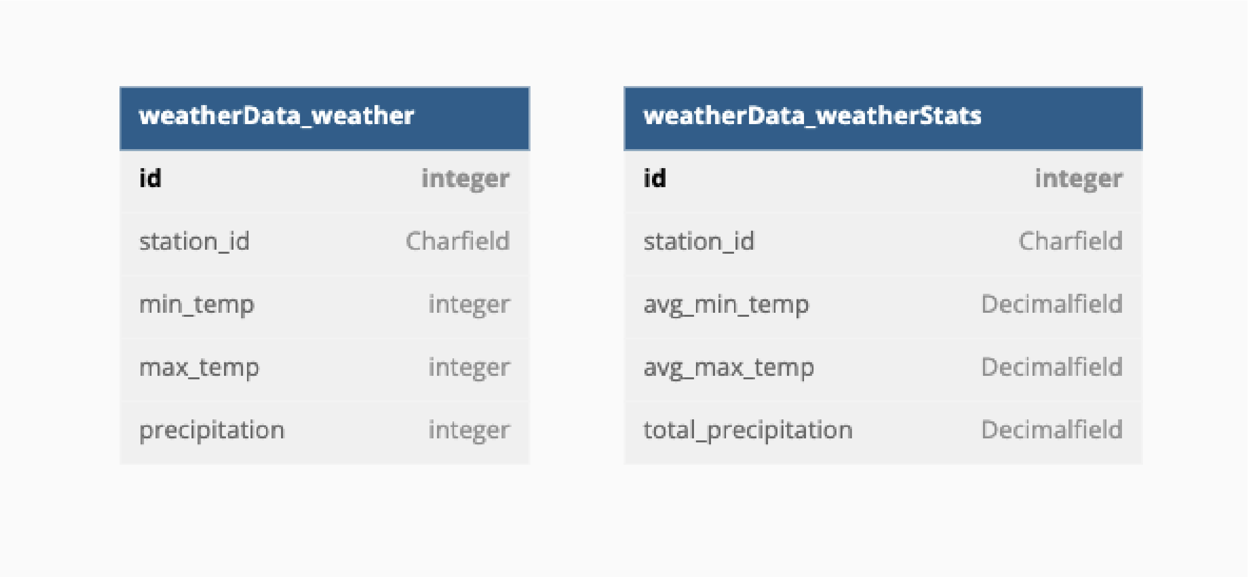
Used Tools:

- Python
- Django Framework
- Django ViewSets
- Djnago Router (Default router)
- Django ORM
- SQLite3
- Django-rest-swagger
- Django-rest-framework
    - Pagination → PageNumberPagination
- Logging (Maintained two logs: for API handling and for Data loading from txt files)
- Pandas
- Numpy
- HTML (for swagger template)
- Pylint
- Pytest

Problem 1:

Data models:



weatherData_weather	
id	integer
station_id	Charfield
min_temp	integer
max_temp	integer
precipitation	integer

weatherData_weatherStats	
id	integer
station_id	Charfield
avg_min_temp	Decimalfield
avg_max_temp	Decimalfield
total_precipitation	Decimalfield

In Django ORM Format:

```
from django.db import models
# Create your models here.
## I created Weather class. This creates equivalent SQL commands through DJANGO ORM
```

```
class Weather(models.Model):
   station_id = models.CharField(max_length=255)
   date = models.DateField()
   max_temp = models.IntegerField(null=True)
   min_temp = models.IntegerField(null=True)
   precipitation = models.IntegerField(null=True)
## I created WeatherStats class. This creates equivalent SQL commands through DJANGO ORM

class WeatherStats(models.Model):
   station_id = models.CharField(max_length=255)
   avg_max_temp = models.DecimalField(max_digits=6, decimal_places= 3, null=True)
   avg_min_temp = models.DecimalField(max_digits=6, decimal_places= 3, null=True)
   total_precipitation = models.DecimalField(max_digits=10, decimal_places= 3, null=True)
```

Problem 2:

Check **dataLoader.py**

- Created sqliteDB called weatherData_weather.
- Even if code is run twice, does not have duplicate values
- Formatted to have unit systems (**tenth of celsius, tenth of millimeter**)
- Handles **all missing values** successfully.

Problem 3:

- Created sqlite Db called WeatherData_weatherStats
- Doesnt allow for duplicate values of station_ID even if code is run twice
- Formatted to follow the unit systems described (**celsius and centimeter**)

Problem 4:

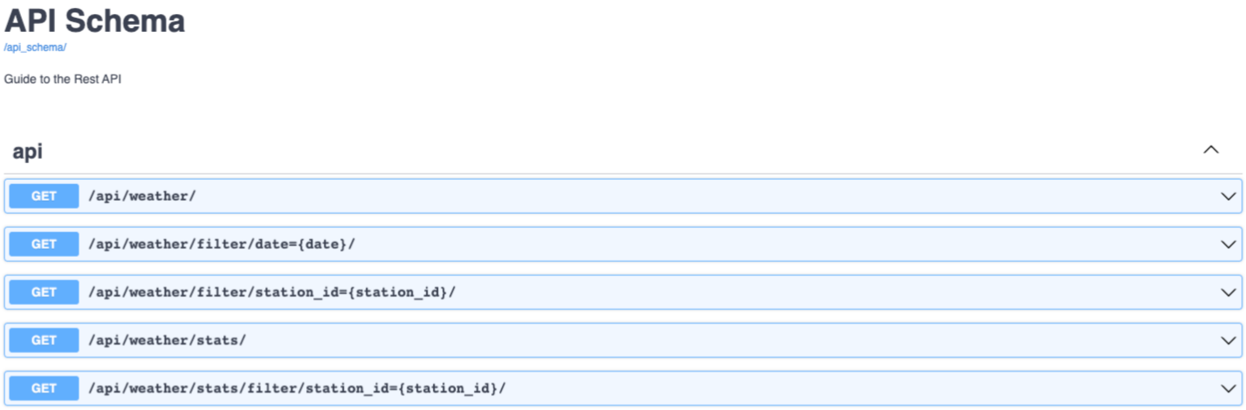
Description:

- Added **pagination**
- Allowed to filter for station_id and date
- Allowed swagger

With Swagger API endpoints:

At endpoint:

```
http://127.0.0.1:8000/docs/
```



API Schema
/api_schema/

Guide to the Rest API

api

GET /api/weather/

GET /api/weather/filter/date={date}/

GET /api/weather/filter/station_id={station_id}/

GET /api/weather/stats/

GET /api/weather/stats/filter/station_id={station_id}/

With API Schema:

All the API schemas can be seen here:

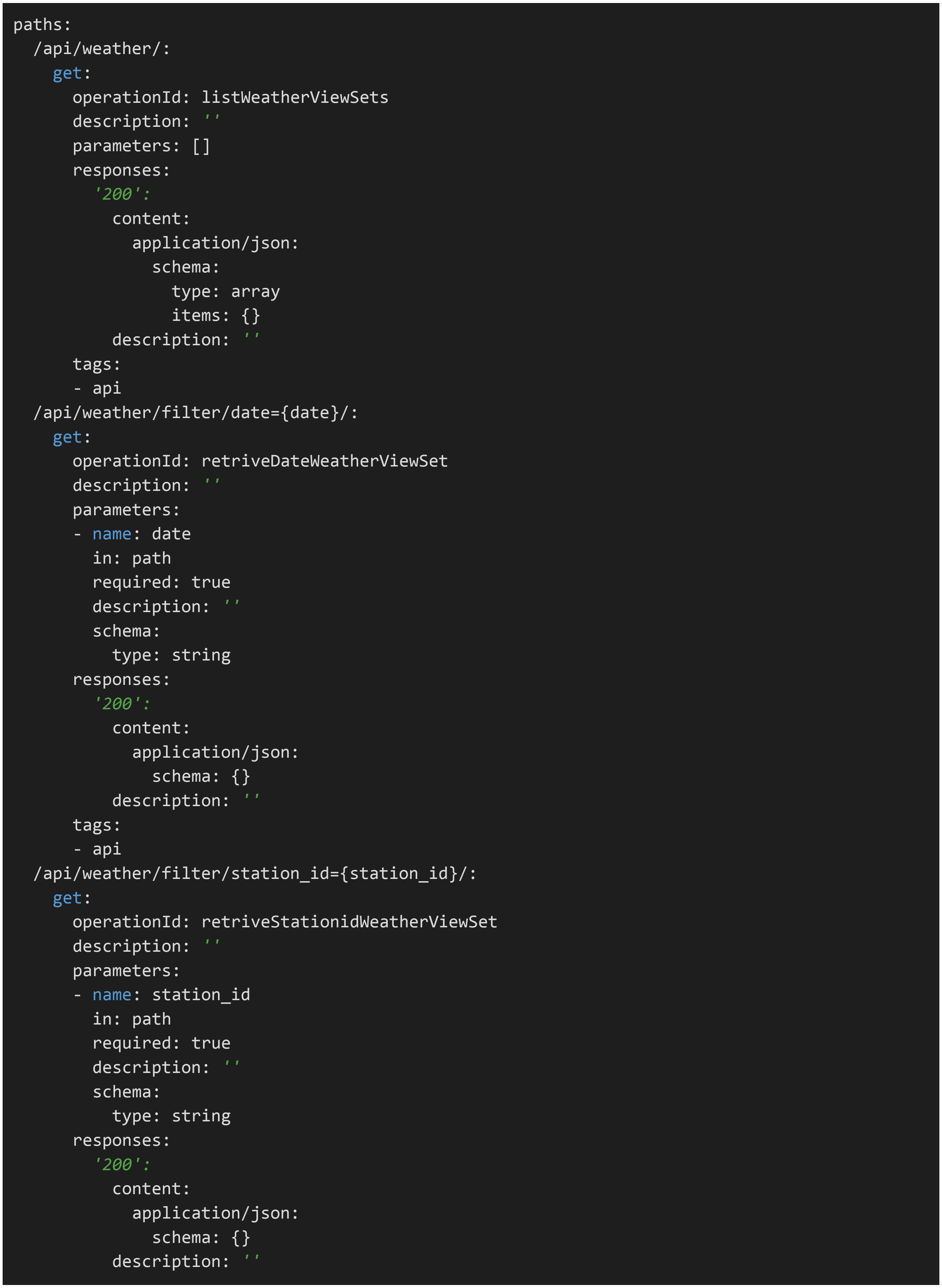
I have create endpoints:

```
GET: /api/weather/
GET: /api/weather/filter/date={date}
GET: /api/weather/filter/station_id={station_id}
GET: /api/weather/stats/
GET: /api/weather/stats/filter/station_id={station_id}
GET: /docs
GET: /api_schema
```

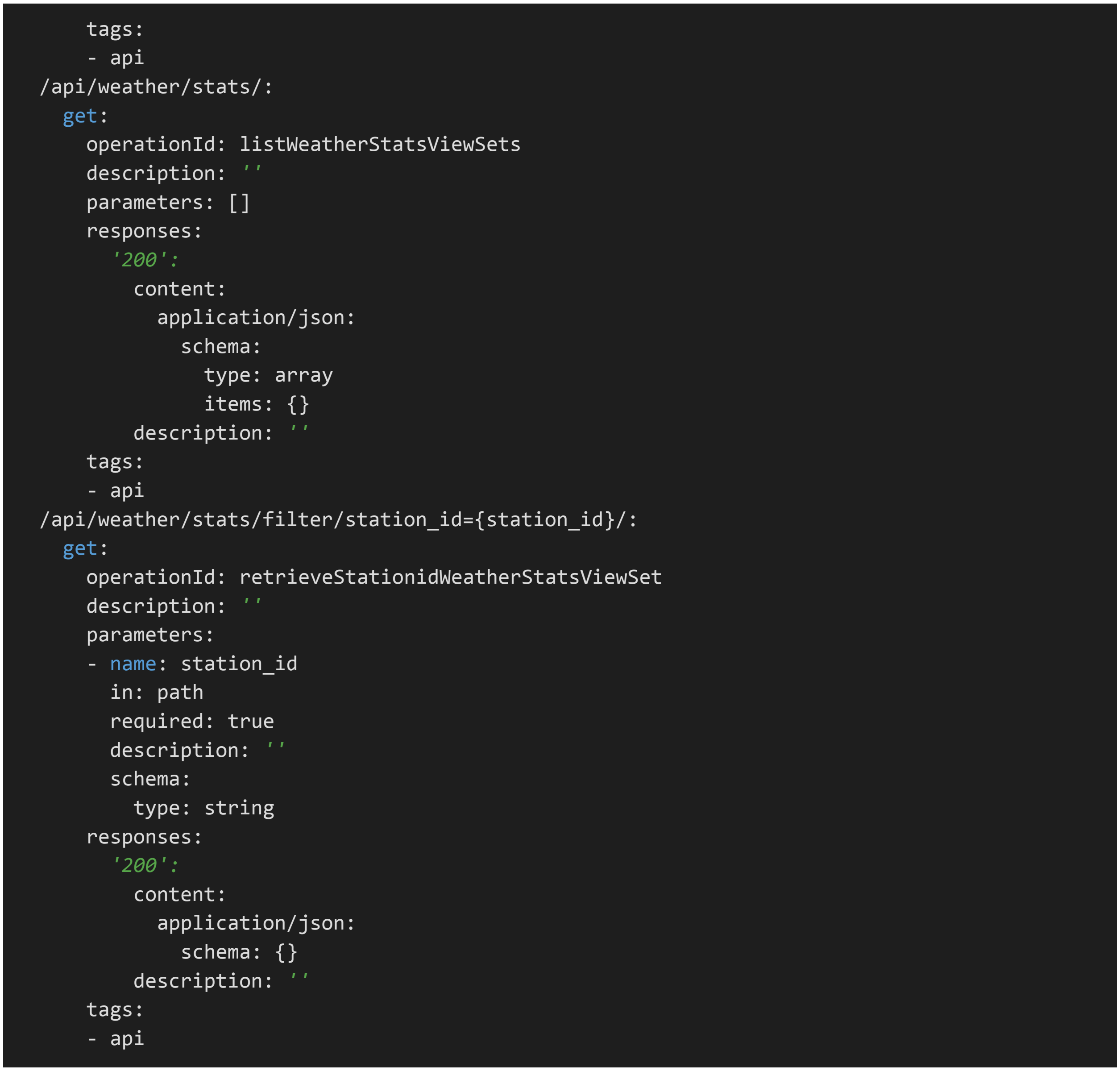
Here station_id should be format r’[A-Z]{3}[0-9]{8}’
Example: USC00110072
Here date should be of format r’[0-9]{8}’.
Example: 19850101 i.e. yyyymmdd

```
GET /api_schema/
HTTP 200 OK
Allow: GET, HEAD, OPTIONS
Content-Type: application/vnd.oai.openapi
Vary: Accept

openapi: 3.0.2
info:
  title: API Schema
  version: ''
  description: Guide to the Rest API
```

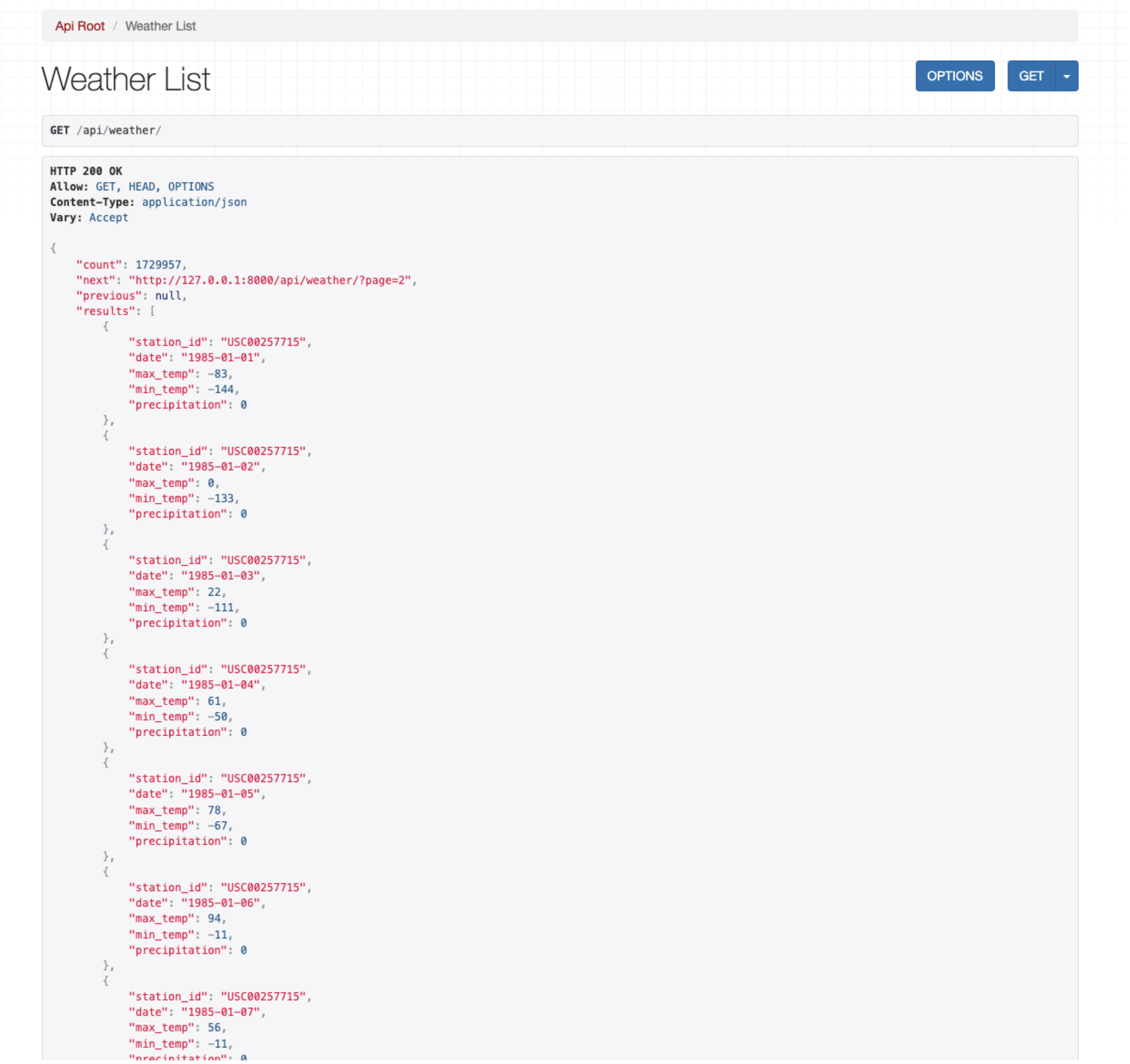


```yaml
paths:
  /api/weather/:
    get:
      operationId: listWeatherViewSets
      description: ''
      parameters: []
      responses:
        '200':
          content:
            application/json:
              schema:
                type: array
                items: {}
          description: ''
      tags:
      - api
  /api/weather/filter/date={date}/:
    get:
      operationId: retriveDateWeatherViewSet
      description: ''
      parameters:
      - name: date
        in: path
        required: true
        description: ''
        schema:
          type: string
      responses:
        '200':
          content:
            application/json:
              schema: {}
          description: ''
      tags:
      - api
  /api/weather/filter/station_id={station_id}/:
    get:
      operationId: retriveStationidWeatherViewSet
      description: ''
      parameters:
      - name: station_id
        in: path
        required: true
        description: ''
        schema:
          type: string
      responses:
        '200':
          content:
            application/json:
              schema: {}
          description: ''
```



```
      tags:
      - api
  /api/weather/stats/:
    get:
      operationId: listWeatherStatsViewSets
      description: ''
      parameters: []
      responses:
        '200':
          content:
            application/json:
              schema:
                type: array
                items: {}
          description: ''
      tags:
      - api
  /api/weather/stats/filter/station_id={station_id}/:
    get:
      operationId: retrieveStationidWeatherStatsViewSet
      description: ''
      parameters:
      - name: station_id
        in: path
        required: true
        description: ''
        schema:
          type: string
      responses:
        '200':
          content:
            application/json:
              schema: {}
          description: ''
      tags:
      - api
```

API GET Weather Data:

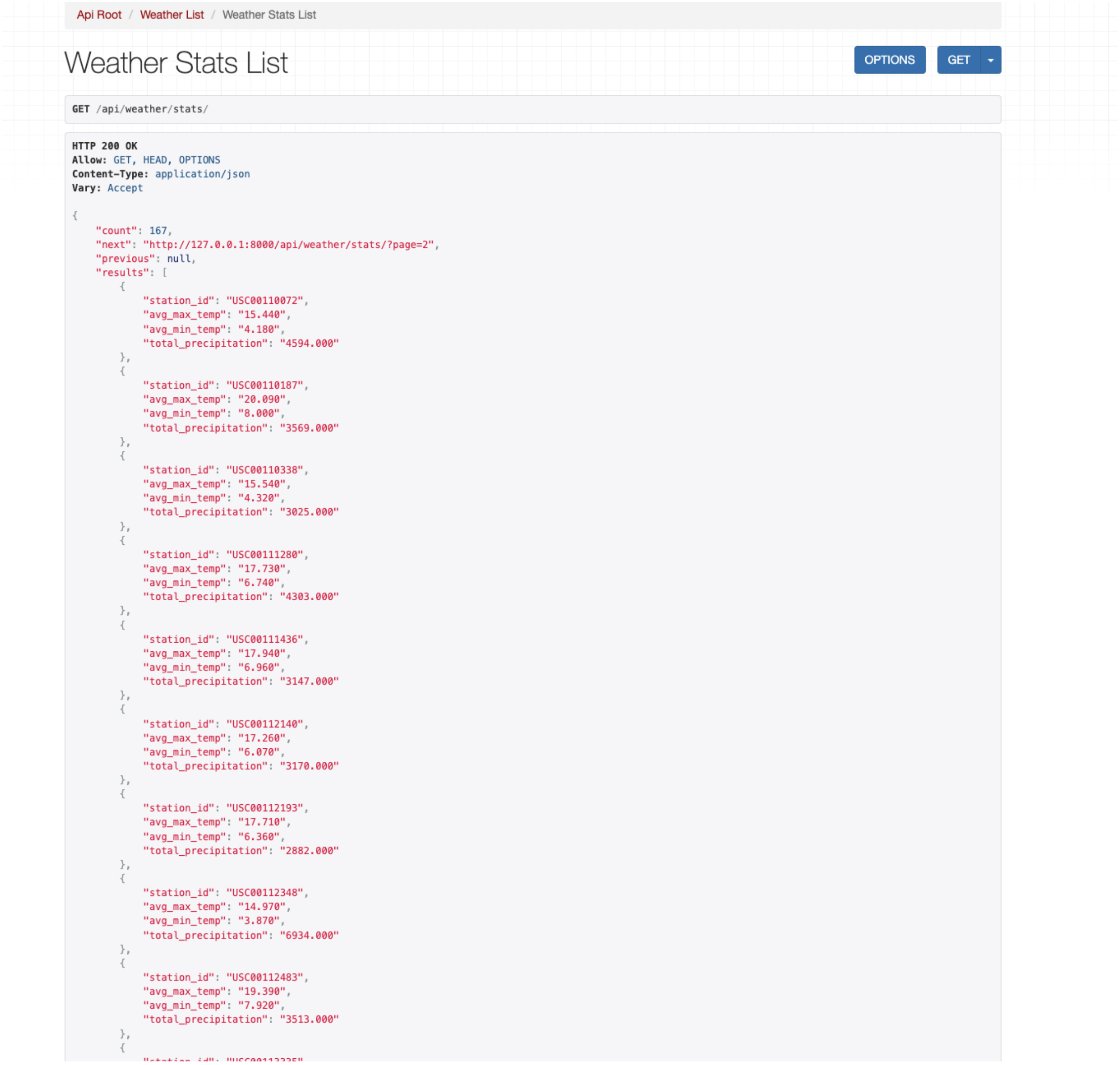


```
GET /api/weather/
```

```
HTTP 200 OK
Allow: GET, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept
```

```
{
    "count": 1729957,
    "next": "http://127.0.0.1:8000/api/weather/?page=2",
    "previous": null,
    "results": [
        {
            "station_id": "USC00257715",
            "date": "1985-01-01",
            "max_temp": -83,
            "min_temp": -144,
            "precipitation": 0
        },
        {
            "station_id": "USC00257715",
            "date": "1985-01-02",
            "max_temp": 0,
            "min_temp": -133,
            "precipitation": 0
        },
        {
            "station_id": "USC00257715",
            "date": "1985-01-03",
            "max_temp": 22,
            "min_temp": -111,
            "precipitation": 0
        },
        {
            "station_id": "USC00257715",
            "date": "1985-01-04",
            "max_temp": 61,
            "min_temp": -50,
            "precipitation": 0
        },
        {
            "station_id": "USC00257715",
            "date": "1985-01-05",
            "max_temp": 78,
            "min_temp": -67,
            "precipitation": 0
        },
        {
            "station_id": "USC00257715",
            "date": "1985-01-06",
            "max_temp": 94,
            "min_temp": -11,
            "precipitation": 0
        },
        {
            "station_id": "USC00257715",
            "date": "1985-01-07",
            "max_temp": 56,
            "min_temp": -11,
            "precipitation": 0
```

API weather stats data:



Weather Stats List

```
GET /api/weather/stats/
```

```
HTTP 200 OK
Allow: GET, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

{
    "count": 167,
    "next": "http://127.0.0.1:8000/api/weather/stats/?page=2",
    "previous": null,
    "results": [
        {
            "station_id": "USC00110072",
            "avg_max_temp": "15.440",
            "avg_min_temp": "4.180",
            "total_precipitation": "4594.000"
        },
        {
            "station_id": "USC00110187",
            "avg_max_temp": "20.090",
            "avg_min_temp": "8.000",
            "total_precipitation": "3569.000"
        },
        {
            "station_id": "USC00110338",
            "avg_max_temp": "15.540",
            "avg_min_temp": "4.320",
            "total_precipitation": "3025.000"
        },
        {
            "station_id": "USC00111280",
            "avg_max_temp": "17.730",
            "avg_min_temp": "6.740",
            "total_precipitation": "4303.000"
        },
        {
            "station_id": "USC00111436",
            "avg_max_temp": "17.940",
            "avg_min_temp": "6.960",
            "total_precipitation": "3147.000"
        },
        {
            "station_id": "USC00112140",
            "avg_max_temp": "17.260",
            "avg_min_temp": "6.070",
            "total_precipitation": "3170.000"
        },
        {
            "station_id": "USC00112193",
            "avg_max_temp": "17.710",
            "avg_min_temp": "6.360",
            "total_precipitation": "2882.000"
        },
        {
            "station_id": "USC00112348",
            "avg_max_temp": "14.970",
            "avg_min_temp": "3.870",
            "total_precipitation": "6934.000"
        },
        {
            "station_id": "USC00112483",
            "avg_max_temp": "19.390",
            "avg_min_temp": "7.920",
            "total_precipitation": "3513.000"
        },
        {
            "station_id": "USC00113335"
```

Problem 5