

Web Engineering M1

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Introduction

We have to create a web app that helps users to decide which carriers (airlines) and which airports to use in the USA for their air travel needs. It builds on the Airline delays dataset made available by the CORGIS dataset projects. Both a JSON and a SCV version of the dataset are available. In our case we will only use the JSON version. This project is split in three milestones (M1,M2,M3) which all have to be achieved. In this document we will look at only at M1(API design) which requires us to create an API design that can give access to the following data:

1. all airports available in the USA,
2. all carriers operating in US airports,
3. all carriers operating at a specific US airport,
4. all statistics about flights of a carrier Update Feb 26: from/to a US airport for a given month/all months available (\dagger),
5. number of on-time, delayed, and cancelled flights of a carrier Update Feb 26: from/to a US airport for a given month/all months available,
6. number of minutes of delay per carrier attributed to carrier-specific reasons (i.e. attributes carrier and late aircraft in the dataset)/all reasons, for a given month/all months available and for a specific airport/across all US airports,
7. descriptive statistics (mean, median, standard deviation) for carrier-specific delays (as above) for a flight between any two airports in the USA for a specific carrier/all carriers serving this route.

Entries marked with (\dagger) require support for both retrieval and manipulation (addition, update, deletion) of data through the API; otherwise only retrieval is to be supported.

API

All data is sent back to the user in a JSON format.

1.

A list of all the available USA airports.

- URL
/airports
- Method
GET
- URL Parameters
NONE
- Data Parameters
NONE
- Header Field:
Content-Type: application/json or text/csv
- Success Response
CODE: 200
The request is successfully received, understood, and accepted.
Content: As JSON

```
airports : {  
  {  
    "code": String  
    "name": String  
  },  
  {  
    "code": String  
    "name": String  
  },  
  ..}
```

- Error Response
CODE: 400
The request contains bad syntax.
CODE: 404
The information you have requested is currently unavailable.

2.

Returns a list of all the operating carriers US airports.

- URL
/carriers
- Method
GET
- URL Parameters
NONE
- Data Parameters
NONE
- Header Field:
Content-Type: application/json or text/csv
- Success Response
CODE: 200
The request is successfully received, understood, and accepted.
Content: As JSON

```
    "carriers" : {  
      {  
        "code": String  
        "name": String  
      },  
      {  
        "code": String  
        "name": String  
      },  
      ..  
    }
```

- Error Response
CODE: 400
The request contains bad syntax.
CODE: 404
The information you have requested is currently unavailable.

Returns a list of all the operating carriers in (a specific) US airport(s).

- URL
airport/{airportCode}/carriers
- Method
GET

- URL Parameters
String airportCode: code of the airport
- Data Parameters
NONE
- Header Field:
Content-Type: application/json or text/csv
- Success Response
CODE: 200
The request is successfully received, understood, and accepted.
Content: As JSON

```
{
  "airport" : {
    "code" : String
    "name" : String
  }
  "carriers" :
  {{
    "code" : String
    "name" : String
  },
  {
    "code" : String
    "name" : String
  },
  ..}
}
```

- Error Response
CODE: 400
The request contains bad syntax.
CODE: 404
The information you have requested is currently unavailable.
- Sample Call
Request to get all carriers of airport with code "ATL".
GET airports/ATL/carriers",

3.

Get, delete and update all statistics about flights of a carrier from/to a US airport for a given month/all months available

- URL
/carrier/{carrierCode}/statistics/flights?way={way}&month={month}&year={year}

- Method
GET || *DELETE* || *PUT*
- URL Parameters
String carrierCode : code of the carrier
- Data Parameters
String way : Which way of the line, "from/to" are used
Integer || **NULL** month : Value in the interval [1,12], if NULL all the months are given
Integer || **NULL** year : Value of 4 digits, if NULL all the year are given
- Header Field:
Content-Type: application/json or text/csv
- Success Response
CODE: 200

```

{
  "way": String
  "month": int
  "year" : int
  "flights": {
    "cancelled": int
    "on_time": int
    "total": int
    "delayed": int
    "diverted": int
  }
}

```

- Error Response
CODE: 400
The request contains bad syntax.
CODE: 404
The information you have requested is currently unavailable.
- Sample Call
Request to get the statistics from the flights of carrier AA for March 2016.
GET /carrier/AA/statistics/flights?way=from&month=3&year=2016

Request to update the statistics from the flights of carrier AA for March 2016.

PUT /carrier/AA/statistics/flights?way=from&month=3&year=2016

Request to delete the statistics from the flights of carrier AA for March 2016.

DELETE /carrier/AA/statistics/flights?way=from&month=31&year=2016

Update all statistics about flights of a carrier from/to a US airport for a given month/all months available

- URL
carriers/{carrierCode}/statistics/flights
- Method
POST
- URL Parameters
String carrierCode : "AA"
- Body Parameters
String way : Which way of the line, "from/to" are used
Integer month : A number in the interval [1,12]
Integer year : A number of 4 digits
Data:

```
"flights": {  
    "cancelled"= int  
    "on time" = int  
    "total" = int  
    "delayed" = int  
    "diverted" = int  
}
```

- Header Field:
Content-Type: application/json or text/csv
- Success Response
CODE: 200

```
{  
    "way": "from"  
    "month": 3  
    "year" : 2016  
    "flights": {  
        "cancelled": 7,
```

```

        "on time": 1034,
        "total": 1266,
        "delayed": 225,
        "diverted": 0
    }
}

```

The database has been updated.

- Error Response
CODE: 400
The request contains bad syntax or data cannot be fulfilled.
CODE: 404
The information you have requested is currently unavailable.
- Sample Call
Request to update the statistics from the flights of carrier AA for March 2016.
POST /carrier/AA/statistics/flights

4.

Number of on-time, delayed, and cancelled flights of a carrier from/to a US airport for a given month/all months available

- URL
carrier/{carrierCode}/statistics/minutesDelayed/way={way}
&month={month}&year={year}&args={args}
- Method
GET
- URL Parameters
String carrierCode : Code of the carrier
- Data Parameters
String way : Which way of the line, "from/to" are used
Integer || **NULL** month : Value in the interval [1,12], if NULL all the months are given
Integer || **NULL** year : Value of 4 digits, if NULL all the year are given
String args : an array of the arguments asked, if NULL all the arguments are given

- Header Field:
Content-Type: application/json or text/csv
- Success Response
CODE: 200

```

{
  way : String
  month : int
  year : int

  "flights": {
    "cancelled": 7,
    "on_time": 1034,
    "delayed": 225,
  }
}

```

- Error Response
CODE: 400
The request contains bad syntax.
CODE: 404
The information you have requested is currently unavailable.
- Sample Call
Request to get ["number of on-time","delayed","cancelled"] flights of carrier "AA", for flight that are "from", on October 2018.
carrier/"AA"/statistics/minutesDelayed/way="from"&month=10&year=2018args=["number of on-time","delayed","cancelled"]

5.

Number of minutes of delay per carrier attributed to carrier-specific reasons/all reasons, for a given month/all months available and for a specific airport/across all US airports.

- URL
carriers/statistics/minutesDelayed/airportCode={airportCode}
&month={month}&year={year}args={args}
- Method
GET
- URL Parameters
NONE

- Data Parameters

String airportCode : airport code

Integer || **NULL** month : Value in the interval [1,12], if NULL all the months are given

Integer || **NULL** year : Value of 4 digits, if NULL all the year are given

String || **NULL** args : an array of the reasons asked, if NULL all the fields are given

```
"args" : {
    late_aircraft = int
    carrier = int
    total = int
}
```

- Header Field:

Content-Type: application/json or text/csv

- Success Response

CODE: 200

```
{
  "airportCode": {
    "code": string
    "name": string
  },
  "month" : int
  "year" : int
  "args" : {
    late_aircraft : int
    carrier : int
    total : int
  }
  "carriers" : {
    [
      "carrier" : {
        "code": "AA",
        "name": "American_Airlines_Inc."
      },
      ..]
  }
}
```

- Error Response
CODE: 400
The request contains bad syntax.
CODE: 404
The information you have requested is currently unavailable.
- Sample Call
Request to get number of minutes of delay per carrier attributed to carrier-
late_aircraft reasons for September 2016 for Boston airport
. carriers/statistics/minutesDelayed/airportCode="BOS"&month=9&year=2016&args=args

6.

Descriptive statistics (mean, median, standard deviation) for carrier-specific delays for a flight between any two airports in the USA for a specific carrier/all carriers serving this route.

- URL
carriers/{carrierCode}/statistics/delays/airport1={airport1}&airport2={airport2}
- Method
GET
- URL Params
String || **NULL** carrierCode : code of the carrier, if NULL all the carriers are given
- Data Params
String airport1 : first airport code **String** airport2 : second airport code
- Success Response
CODE: 200

As JSON

```
{
  "carrier": {
    "code": string
    "name": string
  }
  "airport1": {
    "code": string
    "name": string
  }
  "airport2": {
    "code": string
  }
}
```

```

        "name": string
    }

    mean : float
    median : float
    standard deviation : float
}

```

- Error Response

CODE: 400

The request contains bad syntax.

CODE: 404

The information you have requested is currently unavailable.

- Sample Call

Request to get statistics of flight between Boston and Atlanta airports of American Airlines carrier.

carriers/"AA"/statistics/minutesDelayed/airport1="BOS"&airport2="AA"