# CovidAPI

Generated by Doxygen 1.9.8

# Chapter 1

# Namespace Index

## 1.1 Package List

Here are the packages with brief descriptions (if available):

# Chapter 2

# Hierarchical Index

## 2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

# Chapter 3

# Class Index

## 3.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

# Chapter 4

# File Index

## 4.1  File List

Here is a list of all files with brief descriptions:

# Chapter 5

# Namespace Documentation

## 5.1 CovidAPI Namespace Reference

**Namespaces**

- namespace **Models**
- namespace **Services**

**Classes**

- class **Startup**

  *Configures the application services and requests during startup.*

## 5.2 CovidAPI.Models Namespace Reference

**Classes**

- class **CovidData**

  *Represents the Covid-19 data stored in the database.*
- class **CovidDataDTO**

  *Represents a Data Transfer Object (DTO) for presenting Covid-19 data.*
- class **ErrorResponse**

  *Represents an error response containing information about an error.*
- class **JwtSettings**

  *Represents the settings for JSON Web Token (JWT) authentication.*
- class **LoginRequestDTO**

  *Represents the data transfer object (DTO) for user login requests.*
- class **RegisterRequestDTO**

  *Represents the data transfer object (DTO) for user registration requests.*
- class **User**

  *Represents a user entity.*

## 5.3 CovidAPI.Services Namespace Reference

**Namespaces**

- namespace **Rest**

## 5.4 CovidAPI.Services.Rest Namespace Reference

**Classes**

- class **CovidDataService**

  *Service responsible for handling COVID-19 data operations, including fetching, updating, and deleting data.*
- interface **ICovidDataService**

  *Defines methods for retrieving and managing COVID-19 data.*

# Chapter 6

# Class Documentation

## 6.1 ApplicationDbContext Class Reference

Represents the database context for the application, providing access to data entities.

Inheritance diagram for ApplicationDbContext:
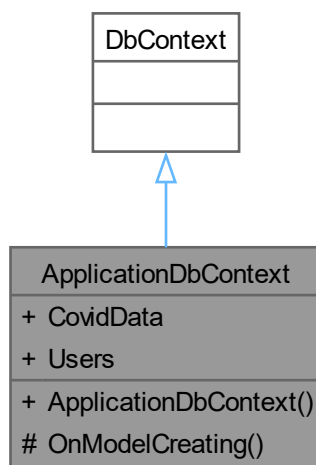
Collaboration diagram for ApplicationDbContext:
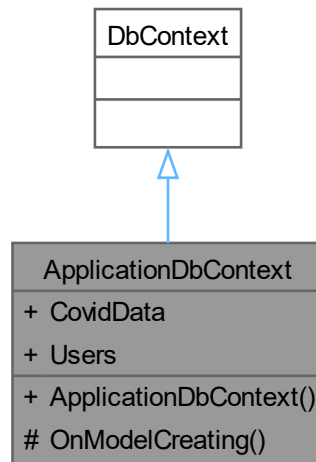


**Public Member Functions**

- **ApplicationDbContext** (DbContextOptions< **ApplicationDbContext** > options)

    *Initializes a new instance of the **ApplicationDbContext** (p. **??**) class.*

**Protected Member Functions**

- override void **OnModelCreating** (ModelBuilder modelBuilder)

    *Configures the model for the database context.*

**Properties**

- DbSet< **CovidData** > **CovidData** `[get, set]`

    *Gets or sets the DbSet for CovidData entities in the database.*
- DbSet< **User** > **Users** `[get, set]`

    *Gets or sets the DbSet for User entities in the database.*

### 6.1.1 Detailed Description

Represents the database context for the application, providing access to data entities.

### 6.1.2 Constructor & Destructor Documentation

#### 6.1.2.1 ApplicationDbContext()

```
ApplicationDbContext.ApplicationDbContext (
            DbContextOptions< ApplicationDbContext > options )
```

Initializes a new instance of the **ApplicationDbContext** (p. **??**) class.

**Parameters**

| *options* | The options for configuring the DbContext. |
|-----------|---------------------------------------------|

### 6.1.3 Member Function Documentation

#### 6.1.3.1 OnModelCreating()

```
override void ApplicationDbContext.OnModelCreating (
            ModelBuilder modelBuilder ) [protected]
```

Configures the model for the database context.

**Parameters**

| *modelBuilder* | The builder used to construct the model for the DbContext. |
|----------------|------------------------------------------------------------|

### 6.1.4 Property Documentation

#### 6.1.4.1 CovidData

```
DbSet< CovidData> ApplicationDbContext.CovidData  [get], [set]
```

Gets or sets the DbSet for CovidData entities in the database.

#### 6.1.4.2 Users

```
DbSet< User> ApplicationDbContext.Users  [get], [set]
```

Gets or sets the DbSet for User entities in the database.

The documentation for this class was generated from the following file:

- Data/ **ApplicationDbContext.cs**

## 6.2 AuthController Class Reference

Controller for authentication-related operations.

Inheritance diagram for AuthController:
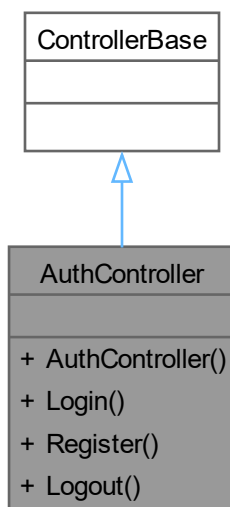


Collaboration diagram for AuthController:
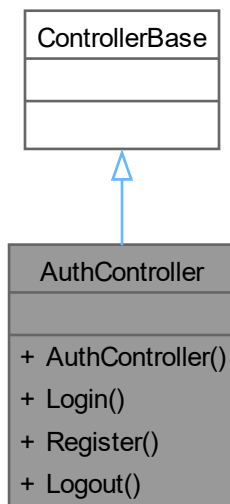


**Public Member Functions**

- **AuthController** ( **IAuthService** authService, **IUserService** userService)

*Initializes a new instance of the **AuthController** (p. **??**) class.*

• async Task< IActionResult > **Login** ([FromBody] **LoginRequestDTO** request)

*Logs in a user.*

• async Task< IActionResult > **Register** ([FromBody] **RegisterRequestDTO** request)

*Registers a new user.*

• async Task< IActionResult > **Logout** ()

*Logs out the currently authenticated user.*

## 6.2.1 Detailed Description

Controller for authentication-related operations.

## 6.2.2 Constructor & Destructor Documentation

### 6.2.2.1 AuthController()

```
AuthController.AuthController (
            IAuthService authService,
            IUserService userService )
```

Initializes a new instance of the **AuthController** (p. **??**) class.

**Parameters**

| | |
|---|---|
| *authService* | The authentication service. |
| *userService* | The user service. |

## 6.2.3 Member Function Documentation

### 6.2.3.1 Login()

```
async Task< IActionResult > AuthController.Login (
            [FromBody]  LoginRequestDTO request )
```

Logs in a user.

**Parameters**

| | |
|---|---|
| *request* | The login request. |

**Returns**

Returns a JWT token if login is successful.

### 6.2.3.2 Logout()

```
async Task< IActionResult > AuthController.Logout ( )
```

Logs out the currently authenticated user.

**Returns**

Returns a success message upon successful logout.

### 6.2.3.3 Register()

```
async Task< IActionResult > AuthController.Register (
            [FromBody]  RegisterRequestDTO request )
```

Registers a new user.

**Parameters**

| | |
|---|---|
| *request* | The registration request. |

**Returns**

Returns a success message and JWT token if registration is successful.

The documentation for this class was generated from the following file:

- Controllers/ **AuthController.cs**

## 6.3  AuthService Class Reference

Service responsible for user authentication and JWT token generation.

Inheritance diagram for AuthService:
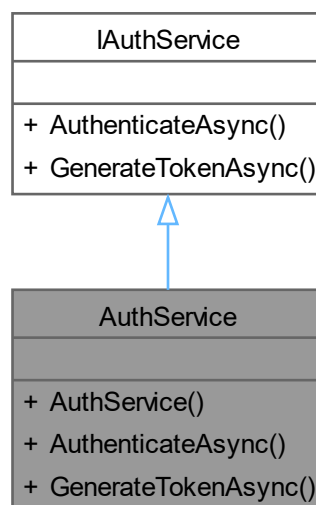
Collaboration diagram for AuthService:
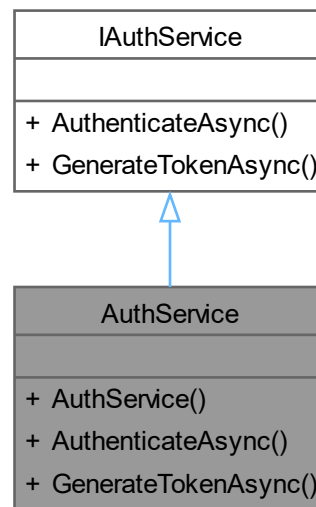


**Public Member Functions**

- **AuthService** ( **IUserService** userService, IConfiguration configuration, **IPasswordService** password↩
Service)

    *Initializes a new instance of the **AuthService** (p. **??**) class.*
- async Task< string > **AuthenticateAsync** (string username, string password)

    *Authenticates a user based on the provided username and password.*
- async Task< string > **GenerateTokenAsync** ( **User** user)

    *Generates a JWT token for the specified user.*

## 6.3.1  Detailed Description

Service responsible for user authentication and JWT token generation.

## 6.3.2  Constructor & Destructor Documentation

### 6.3.2.1  AuthService()

```
AuthService.AuthService (
            IUserService userService,
          IConfiguration configuration,
          IPasswordService passwordService )
```

Initializes a new instance of the **AuthService** (p. **??**) class.

**Parameters**

| | |
|---|---|
| *userService* | The user service. |
| *configuration* | The configuration. |
| *passwordService* | The password service. |

### 6.3.3 Member Function Documentation

#### 6.3.3.1 AuthenticateAsync()

```
async Task< string > AuthService.AuthenticateAsync (
          string username,
          string password )
```

Authenticates a user based on the provided username and password.

**Parameters**

| | |
|---|---|
| *username* | The username of the user. |
| *password* | The password of the user. |

**Returns**

The JWT token if authentication is successful; otherwise, null.

Implements **IAuthService** (p. **??**).

Here is the call graph for this function:



#### 6.3.3.2 GenerateTokenAsync()

```
async Task< string > AuthService.GenerateTokenAsync (
          User user )
```

Generates a JWT token for the specified user.

**Parameters**

| | |
|---|---|
| *user* | The user for whom the token should be generated. |

**Returns**

The generated JWT token.

Implements **IAuthService** (p. **??**).

Here is the caller graph for this function:



The documentation for this class was generated from the following file:

- Services/Rest/ **AuthService.cs**

# 6.4 CovidAPI.Models.CovidData Class Reference

Represents the Covid-19 data stored in the database.

Collaboration diagram for CovidAPI.Models.CovidData:

| CovidAPI.Models.CovidData |
| --- |
| + Id |
| + Country |
| + CountryCode |
| + Year |
| + Week |
| + Region |
| + RegionName |
| + NewCases |
| + TestsDone |
| + Population |
| + TestingRate |
| + PositivityRate |
| + TestingDataSource |
| |

**Properties**

- int **Id** `[get, set]`

    *Gets or sets the unique identifier for the Covid-19 data.*
- string? **Country** `[get, set]`

    *Gets or sets the name of the country where the data belongs.*
- string? **CountryCode** `[get, set]`

    *Gets or sets the country code for the data.*
- int **Year** `[get, set]`

    *Gets or sets the year for which the data is recorded.*
- string? **Week** `[get, set]`

    *Gets or sets the week within the year for which the data is recorded.*
- string? **Region** `[get, set]`

    *Gets or sets the region where the data is recorded.*
- string? **RegionName** `[get, set]`

    *Gets or sets the name of the region where the data is recorded.*
- int **NewCases** `[get, set]`

    *Gets or sets the number of new cases reported.*
- int **TestsDone** `[get, set]`

    *Gets or sets the number of tests conducted.*
- int **Population** `[get, set]`

    *Gets or sets the population of the region.*
- double **TestingRate** `[get, set]`

*Gets or sets the rate of testing.*
- double **PositivityRate** `[get, set]`

    *Gets or sets the positivity rate of the tests conducted.*
- string? **TestingDataSource** `[get, set]`

    *Gets or sets the source of testing data.*

### 6.4.1 Detailed Description

Represents the Covid-19 data stored in the database.

### 6.4.2 Property Documentation

#### 6.4.2.1 Country

```
string?  CovidAPI.Models.CovidData.Country  [get], [set]
```

Gets or sets the name of the country where the data belongs.

#### 6.4.2.2 CountryCode

```
string?  CovidAPI.Models.CovidData.CountryCode  [get], [set]
```

Gets or sets the country code for the data.

#### 6.4.2.3 Id

```
int CovidAPI.Models.CovidData.Id  [get], [set]
```

Gets or sets the unique identifier for the Covid-19 data.

#### 6.4.2.4 NewCases

```
int CovidAPI.Models.CovidData.NewCases  [get], [set]
```

Gets or sets the number of new cases reported.

#### 6.4.2.5 Population

```
int CovidAPI.Models.CovidData.Population  [get], [set]
```

Gets or sets the population of the region.

**6.4.2.6 PositivityRate**

```
double CovidAPI.Models.CovidData.PositivityRate [get], [set]
```

Gets or sets the positivity rate of the tests conducted.

**6.4.2.7 Region**

```
string? CovidAPI.Models.CovidData.Region [get], [set]
```

Gets or sets the region where the data is recorded.

**6.4.2.8 RegionName**

```
string? CovidAPI.Models.CovidData.RegionName [get], [set]
```

Gets or sets the name of the region where the data is recorded.

**6.4.2.9 TestingDataSource**

```
string? CovidAPI.Models.CovidData.TestingDataSource [get], [set]
```

Gets or sets the source of testing data.

**6.4.2.10 TestingRate**

```
double CovidAPI.Models.CovidData.TestingRate [get], [set]
```

Gets or sets the rate of testing.

**6.4.2.11 TestsDone**

```
int CovidAPI.Models.CovidData.TestsDone [get], [set]
```

Gets or sets the number of tests conducted.

**6.4.2.12 Week**

```
string? CovidAPI.Models.CovidData.Week [get], [set]
```

Gets or sets the week within the year for which the data is recorded.

**6.4.2.13 Year**

```
int CovidAPI.Models.CovidData.Year  [get], [set]
```

Gets or sets the year for which the data is recorded.

The documentation for this class was generated from the following file:

- Models/ **CovidData.cs**

## 6.5 CovidDataController Class Reference

Controller for COVID-19 data-related operations.

Inheritance diagram for CovidDataController:

Collaboration diagram for CovidDataController:

```
            ┌─────────────────────┐
            │   ControllerBase    │
            ├─────────────────────┤
            │                     │
            ├─────────────────────┤
            │                     │
            └─────────────────────┘
                      △
                      │
            ┌─────────────────────┐
            │  CovidDataController │
            ├─────────────────────┤
            │                     │
            ├─────────────────────┤
            │ + CovidDataController() │
            │ + GetAllDataAsync() │
            │ + GetDataById()     │
            │ + AddData()         │
            │ + UpdateData()      │
            │ + DeleteData()      │
            │ + GetDataByCountry() │
            │ + GetDataByYear()   │
            │ + GetDataByWeek()   │
            │ + GetAllWeeks()     │
            │ + GetTotalCases()   │
            │ + GetAllCountries() │
            └─────────────────────┘
```
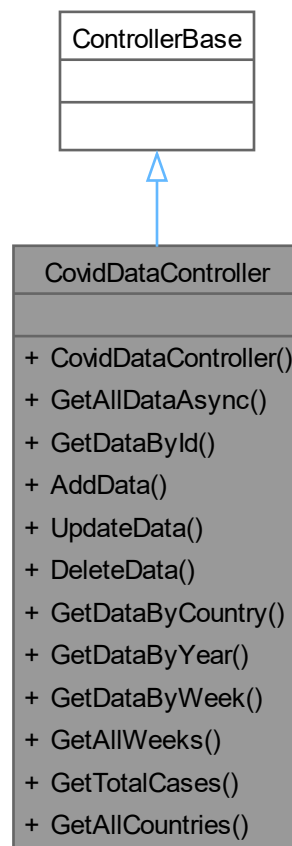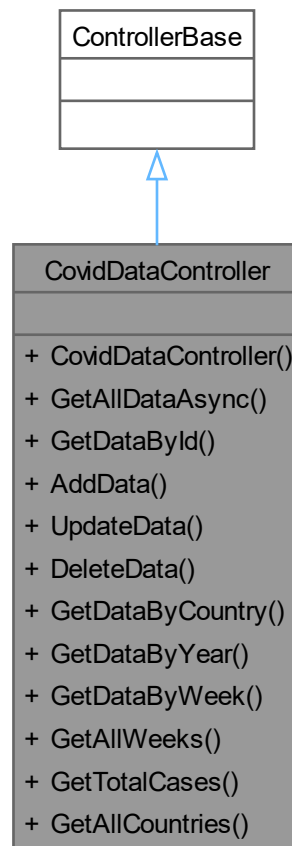
## Public Member Functions

- **CovidDataController** ( **ICovidDataService** covidDataService, **IGeolocationService** geolocationService)

  *Initializes a new instance of the **CovidDataController** (p. **??**) class.*
- async Task< IEnumerable< **CovidDataDTO** > > **GetAllDataAsync** ()

  *Gets all COVID-19 data asynchronously.*
- async Task< ActionResult< **CovidDataDTO** > > **GetDataById** (int id)
- async Task< ActionResult< **CovidDataDTO** > > **AddData** ([FromBody] **CovidDataDTO** covidDataDTO)

  *Adds new COVID-19 data.*
- async Task< IActionResult > **UpdateData** (int id, [FromBody] **CovidDataDTO** covidDataDTO)

  *Updates COVID-19 data by ID.*
- async Task< IActionResult > **DeleteData** (int id)

  *Deletes COVID-19 data by ID.*
- async Task< ActionResult< IEnumerable< **CovidDataDTO** > > > **GetDataByCountry** (string country)

  *Gets COVID-19 data by country.*
- async Task< ActionResult< IEnumerable< **CovidDataDTO** > > > **GetDataByYear** (int year)

  *Gets COVID-19 data by year.*
- async Task< ActionResult< IEnumerable< **CovidDataDTO** > > > **GetDataByWeek** (string week)

*Gets COVID-19 data by week.*

- async Task< ActionResult< IEnumerable< string > > > **GetAllWeeks** ()

  *Gets all available weeks for COVID-19 data.*

- async Task< ActionResult< IEnumerable< **CovidDataDTO** > > > **GetTotalCases** ()

  *Gets total COVID-19 cases.*

- async Task< ActionResult< IEnumerable< string > > > **GetAllCountries** ()

  *Gets a list of all countries with available COVID-19 data.*

## 6.5.1 Detailed Description

Controller for COVID-19 data-related operations.

## 6.5.2 Constructor & Destructor Documentation

### 6.5.2.1 CovidDataController()

```
CovidDataController.CovidDataController (
            ICovidDataService covidDataService,
            IGeolocationService geolocationService )
```

Initializes a new instance of the **CovidDataController** (p. **??**) class.

**Parameters**

| *covidDataService* | The COVID-19 data service. |
|---|---|
| *geolocationService* | The geolocation service. |

## 6.5.3 Member Function Documentation

### 6.5.3.1 AddData()

```
async Task< ActionResult< CovidDataDTO > > CovidDataController.AddData (
            [FromBody] CovidDataDTO covidDataDTO )
```

Adds new COVID-19 data.

**Parameters**

| *covidDataDTO* | The COVID-19 data to add. |
|---|---|

**Returns**

Returns the added COVID-19 data.

Here is the call graph for this function:



**6.5.3.2 DeleteData()**

```
async Task< IActionResult > CovidDataController.DeleteData (
            int id )
```

Deletes COVID-19 data by ID.

**Parameters**

| | |
|---|---|
| *id* | The ID of the COVID-19 data to delete. |

**Returns**

Returns no content if the deletion is successful.

**6.5.3.3 GetAllCountries()**

```
async Task< ActionResult< IEnumerable< string > > > CovidDataController.GetAllCountries ( )
```

Gets a list of all countries with available COVID-19 data.

**Returns**

Returns a list of all countries with available COVID-19 data.

**6.5.3.4 GetAllDataAsync()**

```
async Task< IEnumerable< CovidDataDTO > > CovidDataController.GetAllDataAsync ( )
```

Gets all COVID-19 data asynchronously.

**Returns**

Returns a collection of COVID-19 data.

### 6.5.3.5 GetAllWeeks()

```
async Task< ActionResult< IEnumerable< string > > > CovidDataController.GetAllWeeks ( )
```

Gets all available weeks for COVID-19 data.

**Returns**

Returns a collection of all available weeks.

### 6.5.3.6 GetDataByCountry()

```
async Task< ActionResult< IEnumerable< CovidDataDTO > > > CovidDataController.GetDataBy←
Country (
            string country )
```

Gets COVID-19 data by country.

**Parameters**

| country | The name of the country. |

**Returns**

Returns COVID-19 data for the specified country.

### 6.5.3.7 GetDataById()

```
async Task< ActionResult< CovidDataDTO > > CovidDataController.GetDataById (
            int id )
```

Gets COVID-19 data by ID asynchronously.

**Parameters**

| id | The ID of the COVID-19 data. |

**Returns**

Returns COVID-19 data with the specified ID.

Here is the caller graph for this function:

**6.5.3.8 GetDataByWeek()**

```
async Task< ActionResult< IEnumerable< CovidDataDTO > > > CovidDataController.GetDataByWeek
(
            string week )
```

Gets COVID-19 data by week.

**Parameters**

| | |
|---|---|
| *week* | The week for which to retrieve data. |

**Returns**

Returns COVID-19 data for the specified week.

**6.5.3.9 GetDataByYear()**

```
async Task< ActionResult< IEnumerable< CovidDataDTO > > > CovidDataController.GetDataByYear
(
            int year )
```

Gets COVID-19 data by year.

**Parameters**

| | |
|---|---|
| *year* | The year for which to retrieve data. |

**Returns**

Returns COVID-19 data for the specified year.

**6.5.3.10 GetTotalCases()**

```
async Task< ActionResult< IEnumerable< CovidDataDTO > > > CovidDataController.GetTotalCases
( )
```

Gets total COVID-19 cases.

**Returns**

Returns total COVID-19 cases.

**6.5.3.11 UpdateData()**

```
async Task< IActionResult > CovidDataController.UpdateData (
            int id,
            [FromBody] CovidDataDTO covidDataDTO )
```

Updates COVID-19 data by ID.

**Parameters**

| | |
|---|---|
| *id* | The ID of the COVID-19 data to update. |
| *covidDataDTO* | The updated COVID-19 data. |

**Returns**

Returns no content if the update is successful.

The documentation for this class was generated from the following file:

- Controllers/ **CovidDataController.cs**

## 6.6 CovidAPI.Models.CovidDataDTO Class Reference

Represents a Data Transfer Object (DTO) for presenting Covid-19 data.

Collaboration diagram for CovidAPI.Models.CovidDataDTO:

**Properties**

- int **Id** [get, set]

  *Gets or sets the unique identifier for the Covid-19 data.*
- string **Country** [get, set]

  *Gets or sets the name of the country where the data belongs.*
- string **CountryCode** [get, set]

  *Gets or sets the country code for the data.*
- int **Year** [get, set]

  *Gets or sets the year for which the data is recorded.*
- string **Week** [get, set]

  *Gets or sets the week within the year for which the data is recorded.*
- string **Region** [get, set]

  *Gets or sets the region where the data is recorded.*
- string **RegionName** [get, set]

  *Gets or sets the name of the region where the data is recorded.*
- int **NewCases** [get, set]

  *Gets or sets the number of new cases reported.*
- int **TestsDone** [get, set]

  *Gets or sets the number of tests conducted.*
- int **Population** [get, set]

  *Gets or sets the population of the region.*
- double **PositivityRate** [get, set]

  *Gets or sets the positivity rate of the tests conducted.*
- double **TestingRate** [get, set]

  *Gets or sets the rate of testing.*
- string **TestingDataSource** [get, set]

  *Gets or sets the source of testing data.*
- int? **TotalCasesYear** [get, set]

  *Gets or sets the total cases reported in a specific year.*
- int? **TotalTestsYear** [get, set]

  *Gets or sets the total tests conducted in a specific year.*
- double? **PerCapitaCases** [get, set]

  *Gets or sets the per capita cases (cases per population) for the data.*
- double? **PerCapitaTests** [get, set]

  *Gets or sets the per capita tests (tests per population) for the data.*
- **GeolocationComponents**? **Geolocation** [get, set]

  *Gets or sets the geolocation information for the data.*
- **Geometry**? **Geometry** [get, set]

  *Gets or sets the geometric information for the data.*

## 6.6.1 Detailed Description

Represents a Data Transfer Object (DTO) for presenting Covid-19 data.

## 6.6.2 Property Documentation

### 6.6.2.1 Country

```
string CovidAPI.Models.CovidDataDTO.Country [get], [set]
```

Gets or sets the name of the country where the data belongs.

### 6.6.2.2 CountryCode

`string CovidAPI.Models.CovidDataDTO.CountryCode [get], [set]`

Gets or sets the country code for the data.

### 6.6.2.3 Geolocation

`GeolocationComponents? CovidAPI.Models.CovidDataDTO.Geolocation [get], [set]`

Gets or sets the geolocation information for the data.

### 6.6.2.4 Geometry

`Geometry? CovidAPI.Models.CovidDataDTO.Geometry [get], [set]`

Gets or sets the geometric information for the data.

### 6.6.2.5 Id

`int CovidAPI.Models.CovidDataDTO.Id [get], [set]`

Gets or sets the unique identifier for the Covid-19 data.

### 6.6.2.6 NewCases

`int CovidAPI.Models.CovidDataDTO.NewCases [get], [set]`

Gets or sets the number of new cases reported.

### 6.6.2.7 PerCapitaCases

`double? CovidAPI.Models.CovidDataDTO.PerCapitaCases [get], [set]`

Gets or sets the per capita cases (cases per population) for the data.

### 6.6.2.8 PerCapitaTests

`double? CovidAPI.Models.CovidDataDTO.PerCapitaTests [get], [set]`

Gets or sets the per capita tests (tests per population) for the data.

### 6.6.2.9 Population

`int CovidAPI.Models.CovidDataDTO.Population [get], [set]`

Gets or sets the population of the region.

**6.6.2.10 PositivityRate**

```
double CovidAPI.Models.CovidDataDTO.PositivityRate [get], [set]
```

Gets or sets the positivity rate of the tests conducted.

**6.6.2.11 Region**

```
string CovidAPI.Models.CovidDataDTO.Region [get], [set]
```

Gets or sets the region where the data is recorded.

**6.6.2.12 RegionName**

```
string CovidAPI.Models.CovidDataDTO.RegionName [get], [set]
```

Gets or sets the name of the region where the data is recorded.

**6.6.2.13 TestingDataSource**

```
string CovidAPI.Models.CovidDataDTO.TestingDataSource [get], [set]
```

Gets or sets the source of testing data.

**6.6.2.14 TestingRate**

```
double CovidAPI.Models.CovidDataDTO.TestingRate [get], [set]
```

Gets or sets the rate of testing.

**6.6.2.15 TestsDone**

```
int CovidAPI.Models.CovidDataDTO.TestsDone [get], [set]
```

Gets or sets the number of tests conducted.

**6.6.2.16 TotalCasesYear**

```
int? CovidAPI.Models.CovidDataDTO.TotalCasesYear [get], [set]
```

Gets or sets the total cases reported in a specific year.

**6.6.2.17 TotalTestsYear**

```
int? CovidAPI.Models.CovidDataDTO.TotalTestsYear [get], [set]
```

Gets or sets the total tests conducted in a specific year.

**6.6.2.18 Week**

```
string CovidAPI.Models.CovidDataDTO.Week  [get], [set]
```

Gets or sets the week within the year for which the data is recorded.

**6.6.2.19 Year**

```
int CovidAPI.Models.CovidDataDTO.Year  [get], [set]
```

Gets or sets the year for which the data is recorded.

The documentation for this class was generated from the following file:

- Models/ **CovidDataDTO.cs**

# 6.7 CovidAPI.Services.Rest.CovidDataService Class Reference

Service responsible for handling COVID-19 data operations, including fetching, updating, and deleting data.

Inheritance diagram for CovidAPI.Services.Rest.CovidDataService:

```
┌─────────────────────────────────────┐
│         ICovidDataService           │
├─────────────────────────────────────┤
│                                     │
├─────────────────────────────────────┤
│  + GetAllDataAsync()                │
│  + GetDataByIdAsync()               │
│  + GetDataByYearAsync()             │
│  + GetDataByWeekAsync()             │
│  + GetTotalCasesAsync()             │
│  + GetNewCasesAsync()               │
│  + GetTotalTestsAsync()             │
│  + GetTestingRateAsync()            │
│  + GetPositivityRateAsync()         │
│  + GetGeolocationAsync()            │
│    and 12 more...                   │
└─────────────────────────────────────┘
                  △
                  │
┌─────────────────────────────────────┐
│   CovidAPI.Services.Rest.Covid      │
│           DataService               │
├─────────────────────────────────────┤
│                                     │
├─────────────────────────────────────┤
│  + CovidDataService()               │
│  + DataExistsForCountryAndWeek      │
│    Async()                          │
│  + GetDataByCountryAndWeekAsync()   │
│  + GetAllDataAsync()                │
│  + GetDataByIdAsync()               │
│  + GetDataByYearAsync()             │
│  + GetDataByWeekAsync()             │
│  + AddDataAsync()                   │
│  + UpdateDataAsync()                │
│  + DeleteDataAsync()                │
│    and 14 more...                   │
└─────────────────────────────────────┘
```

Collaboration diagram for CovidAPI.Services.Rest.CovidDataService:

```
                        ┌─────────────────────────────┐
                        │       ICovidDataService      │
                        ├─────────────────────────────┤
                        ├─────────────────────────────┤
                        │  + GetAllDataAsync()         │
                        │  + GetDataByIdAsync()        │
                        │  + GetDataByYearAsync()      │
                        │  + GetDataByWeekAsync()      │
                        │  + GetTotalCasesAsync()      │
                        │  + GetNewCasesAsync()        │
                        │  + GetTotalTestsAsync()      │
                        │  + GetTestingRateAsync()     │
                        │  + GetPositivityRateAsync()  │
                        │  + GetGeolocationAsync()     │
                        │    and 12 more...            │
                        └─────────────────────────────┘
                                     △
                                     │
                        ┌─────────────────────────────┐
                        │  CovidAPI.Services.Rest.Covid│
                        │          DataService         │
                        ├─────────────────────────────┤
                        ├─────────────────────────────┤
                        │  + CovidDataService()        │
                        │  + DataExistsForCountryAndWeek│
                        │    Async()                   │
                        │  + GetDataByCountryAndWeekAsync()│
                        │  + GetAllDataAsync()         │
                        │  + GetDataByIdAsync()        │
                        │  + GetDataByYearAsync()      │
                        │  + GetDataByWeekAsync()      │
                        │  + AddDataAsync()            │
                        │  + UpdateDataAsync()         │
                        │  + DeleteDataAsync()         │
                        │    and 14 more...            │
                        └─────────────────────────────┘
```

**Public Member Functions**

- **CovidDataService** ( **ApplicationDbContext** context, **IGeolocationService** geolocationService, ILogger< **CovidDataService** > logger, **GeolocationCache** geolocationCache, IOptions< DbContextOptions< **ApplicationDbContext** > > dbContextOptions)
- async Task< bool > **DataExistsForCountryAndWeekAsync** (string country, string week)

    *Checks if data exists for a specific country and week.*

- async Task< **CovidData** > **GetDataByCountryAndWeekAsync** (string country, string week)
- async Task< IEnumerable< **CovidDataDTO** > > **GetAllDataAsync** (bool includeGeolocation)

   *Retrieves all COVID-19 data as DTOs, optionally including geolocation information.*
- async Task< **CovidDataDTO** > **GetDataByIdAsync** (int id, bool includeGeolocation)

   *Retrieves COVID-19 data for a specific ID.*
- async Task< IEnumerable< **CovidDataDTO** > > **GetDataByYearAsync** (int year, bool includeGeolocation)

   *Retrieves COVID-19 data for a specific year, optionally including geolocation information.*
- async Task< IEnumerable< **CovidDataDTO** > > **GetDataByWeekAsync** (string week, bool include↩
Geolocation)

   *Retrieves COVID-19 data for a specific week, optionally including geolocation information.*
- async Task **AddDataAsync** ( **CovidDataDTO** covidDataDTO)

   *Adds COVID-19 data to the database.*
- async Task **UpdateDataAsync** ( **CovidDataDTO** covidDataDTO)

   *Updates existing COVID-19 data in the database.*
- async Task **DeleteDataAsync** (int id)

   *Deletes COVID-19 data from the database by ID.*
- async Task< IEnumerable< **CovidDataDTO** > > **GetDataByCountryAsync** (string country, bool include↩
Geolocation)

   *Retrieves COVID-19 data for a specific country, optionally including geolocation information.*
- async Task< IEnumerable< string > > **GetAllWeeksAsync** ()

   *Retrieves a list of unique weeks available in the CovidData records.*
- async Task< IEnumerable< **CovidDataDTO** > > **GetTotalCasesAsync** (bool includeGeolocation)

   *Retrieves total cases data by grouping CovidData records by country and calculating the sum of new cases for each country.*
- async Task< IEnumerable< **CovidDataDTO** > > **GetNewCasesAsync** (bool includeGeolocation)

   *Retrieves new cases data by grouping CovidData records by country and week, calculating the sum of new cases for each country and week.*
- async Task< IEnumerable< **CovidDataDTO** > > **GetPopulationDataAsync** (bool includeGeolocation)

   *Retrieves population data, including the country and population, with an option to include geolocation information.*
- async Task< IEnumerable< **CovidDataDTO** > > **GetComparisonsAsync** (List< string > countries, bool includeGeolocation)

   *Retrieves comparison data for specified countries, with an option to include geolocation information.*
- async Task< IEnumerable< **CovidDataDTO** > > **GetTotalTestsAsync** (bool includeGeolocation)

   *Retrieves total tests data, including the country and total tests for the specific year, with an option to include geolocation information.*
- async Task< IEnumerable< **CovidDataDTO** > > **GetGeolocationAsync** (bool includeGeolocation)

   *Retrieves geolocation data, including the country and geolocation information, with an option to include geolocation information.*
- async Task< IEnumerable< **CovidDataDTO** > > **GetTestingSourceAsync** (bool includeGeolocation)

   *Retrieves testing source data, including the country, testing data source, with an option to include geolocation information.*
- async Task< string > **GetTestingRateInfoAsync** ()

   *Retrieves testing rate information.*
- async Task< IEnumerable< **CovidDataDTO** > > **GetTestsDoneAsync** (bool includeGeolocation)

   *Retrieves tests done data, including the country, week, tests done, population, with an option to include geolocation information.*
- async Task< IEnumerable< **CovidDataDTO** > > **GetPositivityRateAsync** (bool includeGeolocation)

   *Retrieves positivity rate data, including the country, week, positivity rate, population, with an option to include geolocation information.*
- async Task< IEnumerable< **CovidDataDTO** > > **GetTestingRateAsync** (bool includeGeolocation)

   *Retrieves testing rate data, including the country, week, testing rate, population, with an option to include geolocation information.*
- async Task< IEnumerable< string > > **GetAllCountriesAsync** ()

   *Retrieves a list of all countries.*

### 6.7.1 Detailed Description

Service responsible for handling COVID-19 data operations, including fetching, updating, and deleting data.

### 6.7.2 Constructor & Destructor Documentation

#### 6.7.2.1 CovidDataService()

```
CovidAPI.Services.Rest.CovidDataService.CovidDataService (
            ApplicationDbContext context,
            IGeolocationService geolocationService,
            ILogger< CovidDataService > logger,
            GeolocationCache geolocationCache,
            IOptions< DbContextOptions< ApplicationDbContext > > dbContextOptions )
```

### 6.7.3 Member Function Documentation

#### 6.7.3.1 AddDataAsync()

```
async Task CovidAPI.Services.Rest.CovidDataService.AddDataAsync (
            CovidDataDTO covidDataDTO )
```

Adds COVID-19 data to the database.

**Parameters**

| | |
|---|---|
| *covidDataDTO* | The COVID-19 data DTO to add. |

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

#### 6.7.3.2 DataExistsForCountryAndWeekAsync()

```
async Task< bool > CovidAPI.Services.Rest.CovidDataService.DataExistsForCountryAndWeekAsync (
            string country,
            string week )
```

Checks if data exists for a specific country and week.

**Parameters**

| | |
|---|---|
| *country* | The country for which to check data. |
| *week* | The week for which to check data. |

**Returns**

> True if data exists; otherwise, false.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

Here is the call graph for this function:
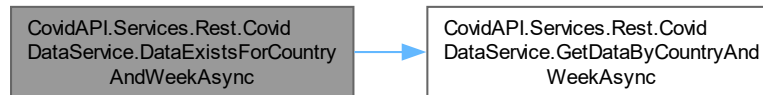


### 6.7.3.3 DeleteDataAsync()

```
async Task CovidAPI.Services.Rest.CovidDataService.DeleteDataAsync (
            int id )
```

Deletes COVID-19 data from the database by ID.

**Parameters**

| | |
|---|---|
| *id* | The ID of the COVID-19 data to delete. |

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.4 GetAllCountriesAsync()

```
async Task< IEnumerable< string > > CovidAPI.Services.Rest.CovidDataService.GetAllCountries↩
Async ( )
```

Retrieves a list of all countries.

**Returns**

An asynchronous task that returns a collection of strings representing all countries.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.5 GetAllDataAsync()

```
async Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.CovidDataService.GetAll↩
DataAsync (
            bool includeGeolocation )
```

Retrieves all COVID-19 data as DTOs, optionally including geolocation information.

**Parameters**

| | |
|---|---|
| *includeGeolocation* | Specifies whether to include geolocation information. |

**Returns**

A list of COVID-19 data DTOs.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.6 GetAllWeeksAsync()

```
async Task< IEnumerable< string > > CovidAPI.Services.Rest.CovidDataService.GetAllWeeksAsync
( )
```

Retrieves a list of unique weeks available in the CovidData records.

**Returns**

An asynchronous task that returns a collection of unique week values.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.7 GetComparisonsAsync()

```
async Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.CovidDataService.Get↩
ComparisonsAsync (
            List< string > countries,
            bool includeGeolocation )
```

Retrieves comparison data for specified countries, with an option to include geolocation information.

**Parameters**

| | |
|---|---|
| *countries* | A list of country names for which to fetch comparison data. |
| *includeGeolocation* | A flag indicating whether to include geolocation data in the results. |

**Returns**

An asynchronous task that returns a collection of CovidDataDTO objects representing comparison data.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.8 GetDataByCountryAndWeekAsync()

```
async Task< CovidData > CovidAPI.Services.Rest.CovidDataService.GetDataByCountryAndWeekAsync
(
```

```
        string country,
        string week )
```

Retrieves COVID-19 data for a specific country and week.

**Parameters**

| | |
|---|---|
| *country* | The country for which to retrieve data. |
| *week* | The week for which to retrieve data. |

**Returns**

> The COVID-19 data for the specified country and week.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

Here is the caller graph for this function:



### 6.7.3.9 GetDataByCountryAsync()

```
async Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.CovidDataService.GetData←
ByCountryAsync (
            string country,
            bool includeGeolocation )
```

Retrieves COVID-19 data for a specific country, optionally including geolocation information.

**Parameters**

| | |
|---|---|
| *country* | The country for which to retrieve data. |
| *includeGeolocation* | Specifies whether to include geolocation information. |

**Returns**

> A list of COVID-19 data DTOs for the specified country.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.10 GetDataByIdAsync()

```
async Task< CovidDataDTO > CovidAPI.Services.Rest.CovidDataService.GetDataByIdAsync (
            int id,
            bool includeGeolocation )
```

Retrieves COVID-19 data for a specific ID.

**Parameters**

| | |
|---|---|
| *id* | The ID of the COVID-19 data to retrieve. |
| *includeGeolocation* | Specifies whether to include geolocation information. |

**Returns**

The COVID-19 data DTO for the specified ID.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.11 GetDataByWeekAsync()

```
async Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.CovidDataService.GetData↩
ByWeekAsync (
            string week,
            bool includeGeolocation )
```

Retrieves COVID-19 data for a specific week, optionally including geolocation information.

**Parameters**

| | |
|---|---|
| *week* | The week for which to retrieve data. |
| *includeGeolocation* | Specifies whether to include geolocation information. |

**Returns**

A list of COVID-19 data DTOs for the specified week.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.12 GetDataByYearAsync()

```
async Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.CovidDataService.GetData↩
ByYearAsync (
            int year,
            bool includeGeolocation )
```

Retrieves COVID-19 data for a specific year, optionally including geolocation information.

**Parameters**

| | |
|---|---|
| *year* | The year for which to retrieve data. |
| *includeGeolocation* | Specifies whether to include geolocation information. |

**Returns**

A list of COVID-19 data DTOs for the specified year.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.13 GetGeolocationAsync()

```
async Task< IEnumerable<  CovidDataDTO > > CovidAPI.Services.Rest.CovidDataService.Get←┘
GeolocationAsync (
            bool includeGeolocation )
```

Retrieves geolocation data, including the country and geolocation information, with an option to include geolocation information.

**Parameters**

| *includeGeolocation* | A flag indicating whether to include geolocation data in the results. |

**Returns**

An asynchronous task that returns a collection of CovidDataDTO objects representing geolocation data.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.14 GetNewCasesAsync()

```
async Task< IEnumerable<  CovidDataDTO > > CovidAPI.Services.Rest.CovidDataService.GetNew←┘
CasesAsync (
            bool includeGeolocation )
```

Retrieves new cases data by grouping CovidData records by country and week, calculating the sum of new cases for each country and week.

**Parameters**

| *includeGeolocation* | A flag indicating whether to include geolocation data in the results. |

**Returns**

An asynchronous task that returns a collection of CovidDataDTO objects representing new cases data.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.15 GetPopulationDataAsync()

```
async Task< IEnumerable<  CovidDataDTO > > CovidAPI.Services.Rest.CovidDataService.Get←┘
PopulationDataAsync (
            bool includeGeolocation )
```

Retrieves population data, including the country and population, with an option to include geolocation information.

**Parameters**

| | |
|---|---|
| *includeGeolocation* | A flag indicating whether to include geolocation data in the results. |

**Returns**

An asynchronous task that returns a collection of CovidDataDTO objects representing population data.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.16 GetPositivityRateAsync()

```
async Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.CovidDataService.Get↩
PositivityRateAsync (
            bool includeGeolocation )
```

Retrieves positivity rate data, including the country, week, positivity rate, population, with an option to include geolocation information.

**Parameters**

| | |
|---|---|
| *includeGeolocation* | A flag indicating whether to include geolocation data in the results. |

**Returns**

An asynchronous task that returns a collection of CovidDataDTO objects representing positivity rate data.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.17 GetTestingRateAsync()

```
async Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.CovidDataService.Get↩
TestingRateAsync (
            bool includeGeolocation )
```

Retrieves testing rate data, including the country, week, testing rate, population, with an option to include geolocation information.

**Parameters**

| | |
|---|---|
| *includeGeolocation* | A flag indicating whether to include geolocation data in the results. |

**Returns**

An asynchronous task that returns a collection of CovidDataDTO objects representing testing rate data.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.18 GetTestingRateInfoAsync()

```
async Task< string > CovidAPI.Services.Rest.CovidDataService.GetTestingRateInfoAsync ( )
```

Retrieves testing rate information.

**Returns**

An asynchronous task that returns a string representing testing rate information.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.19 GetTestingSourceAsync()

```
async Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.CovidDataService.Get←
TestingSourceAsync (
            bool includeGeolocation )
```

Retrieves testing source data, including the country, testing data source, with an option to include geolocation information.

**Parameters**

| *includeGeolocation* | A flag indicating whether to include geolocation data in the results. |

**Returns**

An asynchronous task that returns a collection of CovidDataDTO objects representing testing source data.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.20 GetTestsDoneAsync()

```
async Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.CovidDataService.GetTests←
DoneAsync (
            bool includeGeolocation )
```

Retrieves tests done data, including the country, week, tests done, population, with an option to include geolocation information.

**Parameters**

| *includeGeolocation* | A flag indicating whether to include geolocation data in the results. |

**Returns**

An asynchronous task that returns a collection of CovidDataDTO objects representing tests done data.

### 6.7.3.21 GetTotalCasesAsync()

```
async Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.CovidDataService.GetTotal↩
CasesAsync (
            bool includeGeolocation )
```

Retrieves total cases data by grouping CovidData records by country and calculating the sum of new cases for each country.

**Parameters**

| | |
|---|---|
| *includeGeolocation* | A flag indicating whether to include geolocation data in the results. |

**Returns**

An asynchronous task that returns a collection of CovidDataDTO objects representing total cases data.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.22 GetTotalTestsAsync()

```
async Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.CovidDataService.GetTotal↩
TestsAsync (
            bool includeGeolocation )
```

Retrieves total tests data, including the country and total tests for the specific year, with an option to include geolocation information.

**Parameters**

| | |
|---|---|
| *includeGeolocation* | A flag indicating whether to include geolocation data in the results. |

**Returns**

An asynchronous task that returns a collection of CovidDataDTO objects representing total tests data.

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

### 6.7.3.23 UpdateDataAsync()

```
async Task CovidAPI.Services.Rest.CovidDataService.UpdateDataAsync (
            CovidDataDTO covidDataDTO )
```

Updates existing COVID-19 data in the database.

**Parameters**

| | |
|---|---|
| *covidDataDTO* | The COVID-19 data DTO with updated information. |

Implements **CovidAPI.Services.Rest.ICovidDataService** (p. **??**).

The documentation for this class was generated from the following file:

- Services/Rest/ **CovidDataService.cs**

## 6.8   CovidAPI.Models.ErrorResponse Class Reference

Represents an error response containing information about an error.

Collaboration diagram for CovidAPI.Models.ErrorResponse:



**Public Member Functions**

- override string **ToString** ()

     *Converts the object to its equivalent JSON representation.*

**Properties**

- int **ErrorCode**  `[get, set]`

     *Gets or sets the error code associated with the error.*
- string **Message**  `[get, set]`

     *Gets or sets the error message providing details about the encountered error.*

### 6.8.1   Detailed Description

Represents an error response containing information about an error.

## 6.8.2 Member Function Documentation

### 6.8.2.1 ToString()

```
override string CovidAPI.Models.ErrorResponse.ToString ( )
```

Converts the object to its equivalent JSON representation.

**Returns**

A JSON string representing the current object.

Here is the caller graph for this function:



## 6.8.3 Property Documentation

### 6.8.3.1 ErrorCode

```
int CovidAPI.Models.ErrorResponse.ErrorCode  [get], [set]
```

Gets or sets the error code associated with the error.

### 6.8.3.2 Message

```
string CovidAPI.Models.ErrorResponse.Message  [get], [set]
```

Gets or sets the error message providing details about the encountered error.

The documentation for this class was generated from the following file:

- Models/ **ErrorResponse.cs**

# 6.9 GeolocationApiResponse Class Reference

Represents the response from a geolocation API.

Collaboration diagram for GeolocationApiResponse:



**Properties**

- List< **GeolocationResult** > **Results**  `[get, set]`

  *Gets or sets the list of geolocation results.*

## 6.9.1 Detailed Description

Represents the response from a geolocation API.

## 6.9.2 Property Documentation

### 6.9.2.1 Results

List< **GeolocationResult**> GeolocationApiResponse.Results  `[get], [set]`

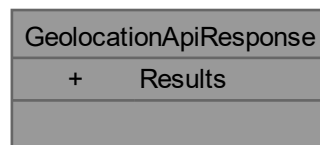Gets or sets the list of geolocation results.

The documentation for this class was generated from the following file:

- Models/ **GeolocationApiResponse.cs**

## 6.10 GeolocationCache Class Reference

Represents a cache for storing geolocation data to avoid redundant API calls.

Collaboration diagram for GeolocationCache:
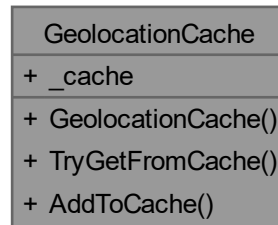


**Public Member Functions**

- **GeolocationCache** ()
- bool **TryGetFromCache** (string country, out **GeolocationApiResponse** geolocationResponse)

    *Tries to retrieve geolocation data from the cache for a specific country.*
- void **AddToCache** (string country, **GeolocationApiResponse** geolocationResponse)

    *Adds geolocation data to the cache for a specific country.*

### 6.10.1 Detailed Description

Represents a cache for storing geolocation data to avoid redundant API calls.

### 6.10.2 Constructor & Destructor Documentation

#### 6.10.2.1 GeolocationCache()

```
GeolocationCache.GeolocationCache ( )
```

### 6.10.3 Member Function Documentation

#### 6.10.3.1 AddToCache()

```
void GeolocationCache.AddToCache (
            string country,
            GeolocationApiResponse geolocationResponse )
```

Adds geolocation data to the cache for a specific country.

**Parameters**

| | |
|---|---|
| *country* | The country for which to add geolocation data to the cache. |
| *geolocationResponse* | The geolocation response to be added to the cache. |

### 6.10.3.2 TryGetFromCache()

```
bool GeolocationCache.TryGetFromCache (
            string country,
            out  GeolocationApiResponse geolocationResponse )
```

Tries to retrieve geolocation data from the cache for a specific country.

**Parameters**

| | |
|---|---|
| *country* | The country for which to retrieve geolocation data. |
| *geolocationResponse* | The retrieved geolocation response if successful. |

**Returns**

True if the data is successfully retrieved from the cache; otherwise, false.

The documentation for this class was generated from the following file:

- Services/Rest/ **GeolocationService.cs**

## 6.11   GeolocationComponents Class Reference

Represents the components of a geolocation.

Collaboration diagram for GeolocationComponents:
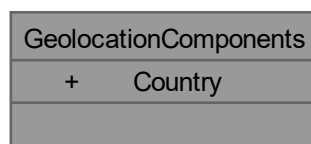


**Properties**

- string **Country** `[get, set]`

  *Gets or sets the country of the geolocation.*

### 6.11.1 Detailed Description

Represents the components of a geolocation.

### 6.11.2 Property Documentation

#### 6.11.2.1 Country

```
string GeolocationComponents.Country  [get], [set]
```

Gets or sets the country of the geolocation.

The documentation for this class was generated from the following file:

- Models/ **GeolocationApiResponse.cs**

## 6.12 GeolocationResult Class Reference

Represents a geolocation result.

Collaboration diagram for GeolocationResult:

| GeolocationResult |
|---|
| + Components |
| + Geometry |
| |
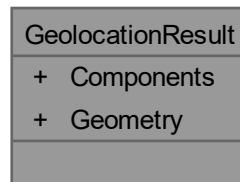
**Properties**

- **GeolocationComponents Components**  `[get, set]`
  *Gets or sets the components of the geolocation.*
- **Geometry Geometry**  `[get, set]`
  *Gets or sets the geometry information of the geolocation.*

### 6.12.1 Detailed Description

Represents a geolocation result.

### 6.12.2  Property Documentation

#### 6.12.2.1  Components

`GeolocationComponents` GeolocationResult.Components  `[get]`, `[set]`

Gets or sets the components of the geolocation.

#### 6.12.2.2  Geometry

`Geometry` GeolocationResult.Geometry  `[get]`, `[set]`

Gets or sets the geometry information of the geolocation.

The documentation for this class was generated from the following file:

- Models/ **GeolocationApiResponse.cs**

## 6.13  GeolocationService Class Reference

Represents a service for retrieving geolocation information for a specific country.

Inheritance diagram for GeolocationService:
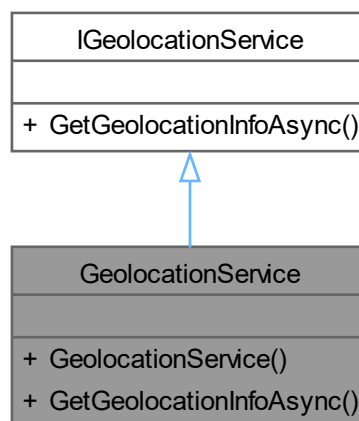
Collaboration diagram for GeolocationService:
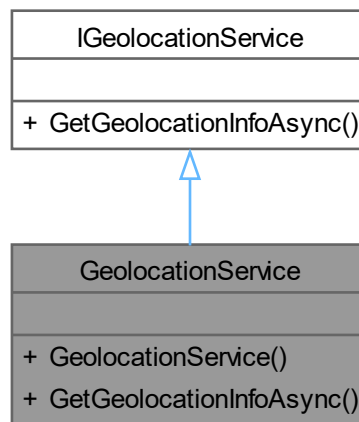


**Public Member Functions**

- **GeolocationService** (IHttpClientFactory httpClientFactory, IConfiguration configuration, ILogger< **GeolocationService** > logger, **GeolocationCache** geolocationCache, IDistributedCache distributed↩ Cache)
- async Task< **GeolocationApiResponse** > **GetGeolocationInfoAsync** (string country)
  
  *Retrieves geolocation information asynchronously for a specific country.*

## 6.13.1 Detailed Description

Represents a service for retrieving geolocation information for a specific country.

## 6.13.2 Constructor & Destructor Documentation

### 6.13.2.1 GeolocationService()

```
GeolocationService.GeolocationService (
          IHttpClientFactory httpClientFactory,
          IConfiguration configuration,
          ILogger< GeolocationService > logger,
           GeolocationCache geolocationCache,
          IDistributedCache distributedCache )
```

## 6.13.3 Member Function Documentation

### 6.13.3.1 GetGeolocationInfoAsync()

```
async Task< GeolocationApiResponse > GeolocationService.GetGeolocationInfoAsync (
          string country )
```

Retrieves geolocation information asynchronously for a specific country.

**Parameters**

| | |
|---|---|
| *country* | The country for which to retrieve geolocation information. |

**Returns**

An asynchronous task that returns the geolocation response.

Implements **IGeolocationService** (p. **??**).

The documentation for this class was generated from the following file:

- Services/Rest/ **GeolocationService.cs**

## 6.14  Geometry Class Reference

Represents the geometry information of a geolocation.

Collaboration diagram for Geometry:
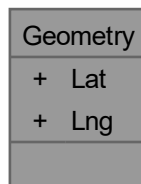


**Properties**

- double **Lat** `[get, set]`
  
  *Gets or sets the latitude of the geolocation.*
- double **Lng** `[get, set]`
  
  *Gets or sets the longitude of the geolocation.*

### 6.14.1  Detailed Description

Represents the geometry information of a geolocation.

### 6.14.2 Property Documentation

#### 6.14.2.1 Lat

```
double Geometry.Lat  [get], [set]
```

Gets or sets the latitude of the geolocation.

#### 6.14.2.2 Lng

```
double Geometry.Lng  [get], [set]
```

Gets or sets the longitude of the geolocation.

The documentation for this class was generated from the following file:

- Models/ **GeolocationApiResponse.cs**

## 6.15 IAuthService Interface Reference

Defines authentication service methods.

Inheritance diagram for IAuthService:
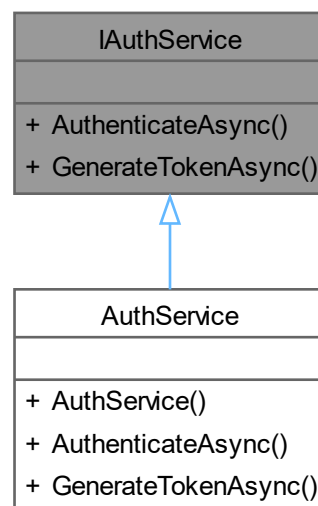
Collaboration diagram for IAuthService:
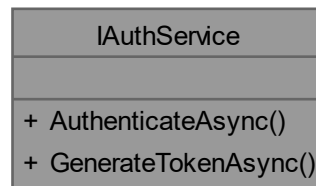


**Public Member Functions**

- Task< string > **AuthenticateAsync** (string username, string password)

  *Authenticates a user based on the provided username and password.*
- Task< string > **GenerateTokenAsync** ( **User** user)

  *Generates an authentication token for the specified user.*

## 6.15.1 Detailed Description

Defines authentication service methods.

## 6.15.2 Member Function Documentation

### 6.15.2.1 AuthenticateAsync()

```
Task< string > IAuthService.AuthenticateAsync (
            string username,
            string password )
```

Authenticates a user based on the provided username and password.

**Parameters**

| | |
|---|---|
| *username* | The username of the user. |
| *password* | The password of the user. |

**Returns**

A task that represents the asynchronous operation. The task result contains an authentication token.

Implemented in **AuthService** (p. **??**).

#### 6.15.2.2 GenerateTokenAsync()

```
Task< string > IAuthService.GenerateTokenAsync (
              User user )
```

Generates an authentication token for the specified user.

**Parameters**

| | |
|---|---|
| *user* | The user for whom the token should be generated. |

**Returns**

A task that represents the asynchronous operation. The task result contains an authentication token.

Implemented in **AuthService** (p. **??**).

The documentation for this interface was generated from the following file:

- Services/Rest/ **IAuthService.cs**

## 6.16 CovidAPI.Services.Rest.ICovidDataService Interface Reference

Defines methods for retrieving and managing COVID-19 data.

Inheritance diagram for CovidAPI.Services.Rest.ICovidDataService:

```
┌─────────────────────────────────┐
│  CovidAPI.Services.Rest.ICovid  │
│          DataService            │
├─────────────────────────────────┤
│                                 │
├─────────────────────────────────┤
│  +   GetAllDataAsync()          │
│  +   GetDataByIdAsync()         │
│  +   GetDataByYearAsync()       │
│  +   GetDataByWeekAsync()       │
│  +   GetTotalCasesAsync()       │
│  +   GetNewCasesAsync()         │
│  +   GetTotalTestsAsync()       │
│  +   GetTestingRateAsync()      │
│  +   GetPositivityRateAsync()   │
│  +   GetGeolocationAsync()      │
│      and 12 more...             │
└─────────────────────────────────┘
                 △
                 │
┌─────────────────────────────────┐
│  CovidAPI.Services.Rest.Covid   │
│          DataService            │
├─────────────────────────────────┤
│                                 │
├─────────────────────────────────┤
│  + CovidDataService()           │
│  + DataExistsForCountryAndWeek  │
│    Async()                      │
│  + GetDataByCountryAndWeekAsync()│
│  + GetAllDataAsync()            │
│  + GetDataByIdAsync()           │
│  + GetDataByYearAsync()         │
│  + GetDataByWeekAsync()         │
│  + AddDataAsync()               │
│  + UpdateDataAsync()            │
│  + DeleteDataAsync()            │
│    and 14 more...               │
└─────────────────────────────────┘
```

Collaboration diagram for CovidAPI.Services.Rest.ICovidDataService:

```
┌─────────────────────────────┐
│ CovidAPI.Services.Rest.ICovid │
│         DataService           │
├─────────────────────────────┤
│                               │
├─────────────────────────────┤
│  +  GetAllDataAsync()         │
│  +  GetDataByIdAsync()        │
│  +  GetDataByYearAsync()      │
│  +  GetDataByWeekAsync()      │
│  +  GetTotalCasesAsync()      │
│  +  GetNewCasesAsync()        │
│  +  GetTotalTestsAsync()      │
│  +  GetTestingRateAsync()     │
│  +  GetPositivityRateAsync()  │
│  +  GetGeolocationAsync()     │
│     and 12 more...            │
└─────────────────────────────┘
```

**Public Member Functions**

- Task< IEnumerable< **CovidDataDTO** > > **GetAllDataAsync** (bool includeGeolocation)

    *Gets all COVID-19 data.*
- Task< **CovidDataDTO** > **GetDataByIdAsync** (int id, bool includeGeolocation)

    *Gets COVID-19 data by identifier.*
- Task< IEnumerable< **CovidDataDTO** > > **GetDataByYearAsync** (int year, bool includeGeolocation)

    *Gets COVID-19 data for a specific year.*
- Task< IEnumerable< **CovidDataDTO** > > **GetDataByWeekAsync** (string week, bool includeGeolocation)

    *Gets COVID-19 data for a specific week.*
- Task< IEnumerable< **CovidDataDTO** > > **GetTotalCasesAsync** (bool includeGeolocation)

    *Gets the total COVID-19 cases.*
- Task< IEnumerable< **CovidDataDTO** > > **GetNewCasesAsync** (bool includeGeolocation)

    *Gets COVID-19 data for new cases.*
- Task< IEnumerable< **CovidDataDTO** > > **GetTotalTestsAsync** (bool includeGeolocation)

    *Gets the total COVID-19 tests.*
- Task< IEnumerable< **CovidDataDTO** > > **GetTestingRateAsync** (bool includeGeolocation)

    *Gets the COVID-19 testing rate.*
- Task< IEnumerable< **CovidDataDTO** > > **GetPositivityRateAsync** (bool includeGeolocation)

    *Gets the COVID-19 positivity rate.*
- Task< IEnumerable< **CovidDataDTO** > > **GetGeolocationAsync** (bool includeGeolocation)

    *Gets COVID-19 geolocation data.*
- Task< IEnumerable< **CovidDataDTO** > > **GetTestingSourceAsync** (bool includeGeolocation)

    *Gets COVID-19 testing source data.*

- Task< IEnumerable< **CovidDataDTO** > > **GetComparisonsAsync** (List< string > countries, bool includeGeolocation)

    *Gets COVID-19 data for specified countries and includes geolocation information if requested.*
- Task< IEnumerable< **CovidDataDTO** > > **GetPopulationDataAsync** (bool includeGeolocation)

    *Gets COVID-19 population data.*
- Task< IEnumerable< string > > **GetAllWeeksAsync** ()

    *Gets a collection of all distinct weeks for COVID-19 data.*
- Task< string > **GetTestingRateInfoAsync** ()

    *Gets information about COVID-19 testing rates.*
- Task< IEnumerable< string > > **GetAllCountriesAsync** ()

    *Gets a collection of all distinct countries for COVID-19 data.*
- Task< bool > **DataExistsForCountryAndWeekAsync** (string country, string week)

    *Checks whether COVID-19 data exists for a specific country and week.*
- Task< **CovidData** > **GetDataByCountryAndWeekAsync** (string country, string week)

    *Gets COVID-19 data for a specific country and week.*
- Task **AddDataAsync** ( **CovidDataDTO** covidDataDTO)

    *Adds new COVID-19 data using the provided data transfer object (DTO).*
- Task **UpdateDataAsync** ( **CovidDataDTO** covidDataDTO)

    *Updates existing COVID-19 data using the provided data transfer object (DTO).*
- Task **DeleteDataAsync** (int id)

    *Deletes COVID-19 data with the specified identifier.*
- Task< IEnumerable< **CovidDataDTO** > > **GetDataByCountryAsync** (string country, bool include↩ Geolocation)

    *Gets COVID-19 data for a specific country with an option to include geolocation information.*

## 6.16.1  Detailed Description

Defines methods for retrieving and managing COVID-19 data.

## 6.16.2  Member Function Documentation

### 6.16.2.1  AddDataAsync()

```
Task CovidAPI.Services.Rest.ICovidDataService.AddDataAsync (
            CovidDataDTO covidDataDTO )
```

Adds new COVID-19 data using the provided data transfer object (DTO).

**Parameters**

| covidDataDTO | The data transfer object containing COVID-19 data. |
|---|---|

**Returns**

A task that represents the asynchronous operation.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.2 DataExistsForCountryAndWeekAsync()

```
Task< bool > CovidAPI.Services.Rest.ICovidDataService.DataExistsForCountryAndWeekAsync (
            string country,
            string week )
```

Checks whether COVID-19 data exists for a specific country and week.

**Parameters**

| | |
|---|---|
| *country* | The name of the country. |
| *week* | The week for which data existence is checked. |

**Returns**

A task that represents the asynchronous operation. The task result is a boolean indicating whether data exists.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.3 DeleteDataAsync()

```
Task CovidAPI.Services.Rest.ICovidDataService.DeleteDataAsync (
            int id )
```

Deletes COVID-19 data with the specified identifier.

**Parameters**

| | |
|---|---|
| *id* | The unique identifier of the COVID-19 data. |

**Returns**

A task that represents the asynchronous operation.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.4 GetAllCountriesAsync()

```
Task< IEnumerable< string > > CovidAPI.Services.Rest.ICovidDataService.GetAllCountriesAsync (
)
```

Gets a collection of all distinct countries for COVID-19 data.

**Returns**

A task that represents the asynchronous operation. The task result contains a collection of strings representing distinct countries.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.5 GetAllDataAsync()

```
Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.ICovidDataService.GetAllDataAsync
(
            bool includeGeolocation )
```

Gets all COVID-19 data.

**Parameters**

| *includeGeolocation* | Indicates whether to include geolocation information. |
|---|---|

**Returns**

A task that represents the asynchronous operation. The task result contains a collection of COVID-19 data.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.6 GetAllWeeksAsync()

```
Task< IEnumerable< string > > CovidAPI.Services.Rest.ICovidDataService.GetAllWeeksAsync ( )
```

Gets a collection of all distinct weeks for COVID-19 data.

**Returns**

A task that represents the asynchronous operation. The task result contains a collection of strings representing distinct weeks.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.7 GetComparisonsAsync()

```
Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.ICovidDataService.GetComparisons←
Async (
            List< string > countries,
            bool includeGeolocation )
```

Gets COVID-19 data for specified countries and includes geolocation information if requested.

**Parameters**

| *countries* | A list of country names to retrieve data for. |
|---|---|
| *includeGeolocation* | Indicates whether to include geolocation information. |

**Returns**

A task that represents the asynchronous operation. The task result contains a collection of COVID-19 data for the specified countries.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.8 GetDataByCountryAndWeekAsync()

```
Task< CovidData > CovidAPI.Services.Rest.ICovidDataService.GetDataByCountryAndWeekAsync (
          string country,
          string week )
```

Gets COVID-19 data for a specific country and week.

**Parameters**

| | |
|---|---|
| *country* | The name of the country. |
| *week* | The week for which data is retrieved. |

**Returns**

A task that represents the asynchronous operation. The task result contains a CovidData object.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.9 GetDataByCountryAsync()

```
Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.ICovidDataService.GetDataBy←
CountryAsync (
          string country,
          bool includeGeolocation )
```

Gets COVID-19 data for a specific country with an option to include geolocation information.

**Parameters**

| | |
|---|---|
| *country* | The name of the country. |
| *includeGeolocation* | A flag indicating whether to include geolocation information. |

**Returns**

A task that represents the asynchronous operation. The task result is a collection of CovidDataDTO objects.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.10 GetDataByIdAsync()

```
Task< CovidDataDTO > CovidAPI.Services.Rest.ICovidDataService.GetDataByIdAsync (
          int id,
          bool includeGeolocation )
```

Gets COVID-19 data by identifier.

**Parameters**

| id | The identifier of the COVID-19 data. |
| --- | --- |
| *includeGeolocation* | Indicates whether to include geolocation information. |

**Returns**

A task that represents the asynchronous operation. The task result contains the COVID-19 data with the specified identifier.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.11 GetDataByWeekAsync()

```
Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.ICovidDataService.GetDataByWeek↩
Async (
            string week,
            bool includeGeolocation )
```

Gets COVID-19 data for a specific week.

**Parameters**

| week | The week for which to retrieve COVID-19 data. |
| --- | --- |
| *includeGeolocation* | Indicates whether to include geolocation information. |

**Returns**

A task that represents the asynchronous operation. The task result contains a collection of COVID-19 data for the specified week.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.12 GetDataByYearAsync()

```
Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.ICovidDataService.GetDataByYear↩
Async (
            int year,
            bool includeGeolocation )
```

Gets COVID-19 data for a specific year.

**Parameters**

| year | The year for which to retrieve COVID-19 data. |
| --- | --- |
| *includeGeolocation* | Indicates whether to include geolocation information. |

**Returns**

A task that represents the asynchronous operation. The task result contains a collection of COVID-19 data for the specified year.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.13 GetGeolocationAsync()

```
Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.ICovidDataService.GetGeolocation↩
Async (
            bool includeGeolocation )
```

Gets COVID-19 geolocation data.

**Parameters**

| | |
|---|---|
| *includeGeolocation* | Indicates whether to include geolocation information. |

**Returns**

A task that represents the asynchronous operation. The task result contains a collection of COVID-19 data with geolocation information.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.14 GetNewCasesAsync()

```
Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.ICovidDataService.GetNewCases↩
Async (
            bool includeGeolocation )
```

Gets COVID-19 data for new cases.

**Parameters**

| | |
|---|---|
| *includeGeolocation* | Indicates whether to include geolocation information. |

**Returns**

A task that represents the asynchronous operation. The task result contains a collection of COVID-19 data representing new cases.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.15 GetPopulationDataAsync()

```
Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.ICovidDataService.GetPopulation↩
DataAsync (
            bool includeGeolocation )
```

Gets COVID-19 population data.

**Parameters**

| | |
|---|---|
| *includeGeolocation* | Indicates whether to include geolocation information. |

**Returns**

A task that represents the asynchronous operation. The task result contains a collection of COVID-19 data with population information.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.16 GetPositivityRateAsync()

```
Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.ICovidDataService.GetPositivity↩
RateAsync (
            bool includeGeolocation )
```

Gets the COVID-19 positivity rate.

**Parameters**

| | |
|---|---|
| *includeGeolocation* | Indicates whether to include geolocation information. |

**Returns**

A task that represents the asynchronous operation. The task result contains a collection of COVID-19 data representing the positivity rate.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.17 GetTestingRateAsync()

```
Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.ICovidDataService.GetTesting↩
RateAsync (
            bool includeGeolocation )
```

Gets the COVID-19 testing rate.

**Parameters**

| | |
|---|---|
| *includeGeolocation* | Indicates whether to include geolocation information. |

**Returns**

A task that represents the asynchronous operation. The task result contains a collection of COVID-19 data representing the testing rate.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.18 GetTestingRateInfoAsync()

```
Task< string > CovidAPI.Services.Rest.ICovidDataService.GetTestingRateInfoAsync ( )
```

Gets information about COVID-19 testing rates.

**Returns**

A task that represents the asynchronous operation. The task result contains a string with information about testing rates.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.19 GetTestingSourceAsync()

```
Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.ICovidDataService.GetTesting↩
SourceAsync (
            bool includeGeolocation )
```

Gets COVID-19 testing source data.

**Parameters**

| | |
|---|---|
| *includeGeolocation* | Indicates whether to include geolocation information. |

**Returns**

A task that represents the asynchronous operation. The task result contains a collection of COVID-19 data with testing source information.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.20 GetTotalCasesAsync()

```
Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.ICovidDataService.GetTotalCases↩
Async (
            bool includeGeolocation )
```

Gets the total COVID-19 cases.

**Parameters**

| | |
|---|---|
| *includeGeolocation* | Indicates whether to include geolocation information. |

**Returns**

A task that represents the asynchronous operation. The task result contains a collection of COVID-19 data representing the total cases.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.21 GetTotalTestsAsync()

```
Task< IEnumerable< CovidDataDTO > > CovidAPI.Services.Rest.ICovidDataService.GetTotalTests↩
Async (
            bool includeGeolocation )
```

Gets the total COVID-19 tests.

**Parameters**

| | |
|---|---|
| *includeGeolocation* | Indicates whether to include geolocation information. |

**Returns**

A task that represents the asynchronous operation. The task result contains a collection of COVID-19 data representing the total tests.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

### 6.16.2.22 UpdateDataAsync()

```
Task CovidAPI.Services.Rest.ICovidDataService.UpdateDataAsync (
            CovidDataDTO covidDataDTO )
```

Updates existing COVID-19 data using the provided data transfer object (DTO).

**Parameters**

| | |
|---|---|
| *covidDataDTO* | The data transfer object containing updated COVID-19 data. |

**Returns**

A task that represents the asynchronous operation.

Implemented in **CovidAPI.Services.Rest.CovidDataService** (p. **??**).

The documentation for this interface was generated from the following file:

- Services/Rest/ **ICovidDataService.cs**

## 6.17 IGeolocationService Interface Reference

Represents a service for retrieving geolocation information related to COVID-19 data.

Inheritance diagram for IGeolocationService:
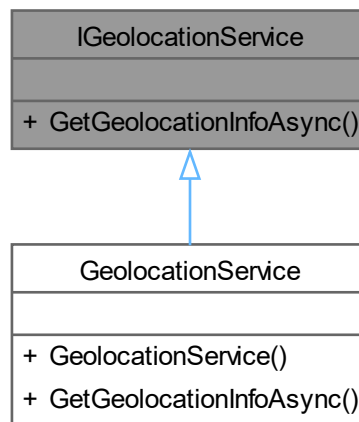


Collaboration diagram for IGeolocationService:



**Public Member Functions**

- Task< **GeolocationApiResponse** > **GetGeolocationInfoAsync** (string country)

  *Gets geolocation information asynchronously for the specified country.*

## 6.17.1 Detailed Description

Represents a service for retrieving geolocation information related to COVID-19 data.

## 6.17.2 Member Function Documentation

### 6.17.2.1 GetGeolocationInfoAsync()

```
Task< GeolocationApiResponse > IGeolocationService.GetGeolocationInfoAsync (
          string country )
```

Gets geolocation information asynchronously for the specified country.

**Parameters**

| | |
|---|---|
| *country* | The name of the country for which geolocation information is requested. |

**Returns**

A task that represents the asynchronous operation. The task result is a **GeolocationApiResponse** (p. **??**) object.

Implemented in **GeolocationService** (p. **??**).

The documentation for this interface was generated from the following file:
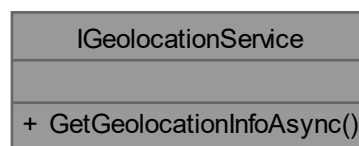
- Services/Rest/ **IGeolocationService.cs**

## 6.18 IPasswordService Interface Reference

Represents a service for hashing, verifying passwords, and generating password salts.

Inheritance diagram for IPasswordService:
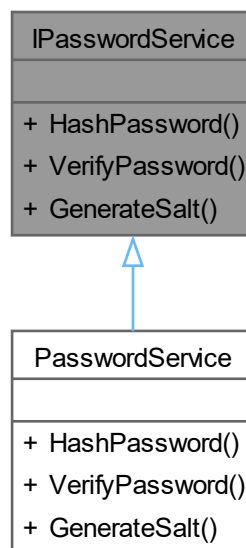
Collaboration diagram for IPasswordService:
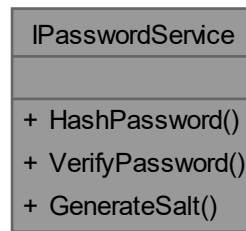
```
┌─────────────────────┐
│  IPasswordService   │
├─────────────────────┤
│                     │
├─────────────────────┤
│ + HashPassword()    │
│ + VerifyPassword()  │
│ + GenerateSalt()    │
└─────────────────────┘
```

**Public Member Functions**

- byte[] **HashPassword** (string password, out string salt)

  *Hashes the provided password and generates a salt.*
- bool **VerifyPassword** (string password, byte[] storedHash, string storedSalt)

  *Verifies if the provided password matches the stored hash and salt.*
- string **GenerateSalt** ()

  *Generates a random salt for password hashing.*

## 6.18.1 Detailed Description

Represents a service for hashing, verifying passwords, and generating password salts.

## 6.18.2 Member Function Documentation

### 6.18.2.1 GenerateSalt()

```
string IPasswordService.GenerateSalt ( )
```

Generates a random salt for password hashing.

**Returns**

The generated salt as a string.

Implemented in **PasswordService** (p. **??**).

### 6.18.2.2 HashPassword()

```
byte[] IPasswordService.HashPassword (
            string password,
            out string salt )
```

Hashes the provided password and generates a salt.

**Parameters**

| | |
|---|---|
| *password* | The password to be hashed. |
| *salt* | The generated salt used in the hashing process. |

**Returns**

The hashed password as a byte array.

Implemented in **PasswordService** (p. **??**).

### 6.18.2.3 VerifyPassword()

```
bool IPasswordService.VerifyPassword (
            string password,
            byte[] storedHash,
            string storedSalt )
```

Verifies if the provided password matches the stored hash and salt.

**Parameters**

| | |
|---|---|
| *password* | The password to be verified. |
| *storedHash* | The stored hashed password. |
| *storedSalt* | The stored salt used in the hashing process. |

**Returns**

True if the password is verified; otherwise, false.

Implemented in **PasswordService** (p. **??**).

The documentation for this interface was generated from the following file:

- Services/Rest/ **IPasswordService.cs**

## 6.19 IUserService Interface Reference

Represents a service for managing user-related operations.

Inheritance diagram for IUserService:
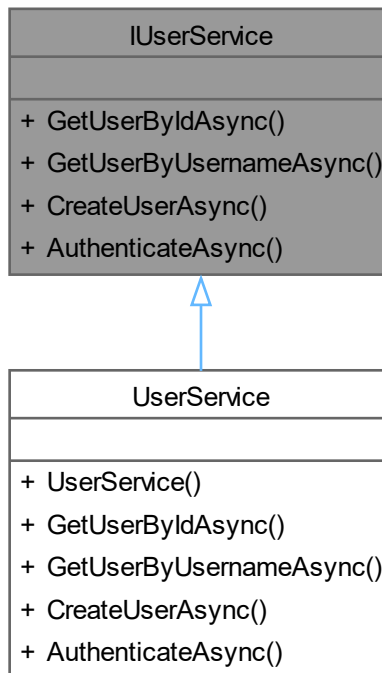


Collaboration diagram for IUserService:
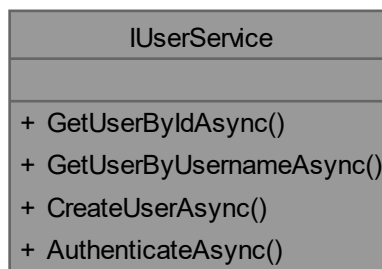


**Public Member Functions**

- Task< **User** > **GetUserByIdAsync** (int userId)

  *Retrieves a user by their unique identifier asynchronously.*
- Task< **User** > **GetUserByUsernameAsync** (string username)

*Retrieves a user by their username asynchronously.*
- Task< **User** > **CreateUserAsync** ( **User** user, string password)

  *Creates a new user asynchronously and associates the provided password.*
- Task< **User** > **AuthenticateAsync** (string username, string password)

  *Authenticates a user by verifying the provided username and password asynchronously.*

## 6.19.1 Detailed Description

Represents a service for managing user-related operations.

## 6.19.2 Member Function Documentation

### 6.19.2.1 AuthenticateAsync()

```
Task< User > IUserService.AuthenticateAsync (
            string username,
            string password )
```

Authenticates a user by verifying the provided username and password asynchronously.

**Parameters**

| | |
|---|---|
| *username* | The username of the user. |
| *password* | The password to be verified. |

**Returns**

A task that represents the asynchronous authentication operation. If authentication is successful, the task holds the authenticated user information; otherwise, it returns null.

Implemented in **UserService** (p. **??**).

### 6.19.2.2 CreateUserAsync()

```
Task< User > IUserService.CreateUserAsync (
            User user,
            string password )
```

Creates a new user asynchronously and associates the provided password.

**Parameters**

| | |
|---|---|
| *user* | The user information to be created. |
| *password* | The password to be associated with the user. |

**Returns**

A task that represents the asynchronous operation and holds the created user information.

Implemented in **UserService** (p. **??**).

### 6.19.2.3 GetUserByIdAsync()

```
Task< User > IUserService.GetUserByIdAsync (
            int userId )
```

Retrieves a user by their unique identifier asynchronously.

**Parameters**

| user↩<br>Id | The unique identifier of the user. |
|---|---|

**Returns**

A task that represents the asynchronous operation and holds the user information.

Implemented in **UserService** (p. **??**).

### 6.19.2.4 GetUserByUsernameAsync()

```
Task< User > IUserService.GetUserByUsernameAsync (
            string username )
```

Retrieves a user by their username asynchronously.

**Parameters**

| username | The username of the user. |
|---|---|

**Returns**

A task that represents the asynchronous operation and holds the user information.

Implemented in **UserService** (p. **??**).

The documentation for this interface was generated from the following file:

- Services/Rest/ **IUserService.cs**

## 6.20 CovidAPI.Models.JwtSettings Class Reference

Represents the settings for JSON Web Token (JWT) authentication.

Collaboration diagram for CovidAPI.Models.JwtSettings:



**Properties**

- string **Secret** `[get, set]`

  *Gets or sets the secret key used for signing and verifying JWT tokens.*
- string **Issuer** `[get, set]`

  *Gets or sets the issuer of the JWT token.*
- string **Audience** `[get, set]`

  *Gets or sets the audience of the JWT token.*

### 6.20.1 Detailed Description

Represents the settings for JSON Web Token (JWT) authentication.

### 6.20.2 Property Documentation

#### 6.20.2.1 Audience

```
string CovidAPI.Models.JwtSettings.Audience [get], [set]
```

Gets or sets the audience of the JWT token.

#### 6.20.2.2 Issuer

```
string CovidAPI.Models.JwtSettings.Issuer [get], [set]
```

Gets or sets the issuer of the JWT token.

**6.20.2.3 Secret**

`string CovidAPI.Models.JwtSettings.Secret [get], [set]`

Gets or sets the secret key used for signing and verifying JWT tokens.

The documentation for this class was generated from the following file:

- Models/ **JwtSettings.cs**

# 6.21 CovidAPI.Models.LoginRequestDTO Class Reference

Represents the data transfer object (DTO) for user login requests.

Collaboration diagram for CovidAPI.Models.LoginRequestDTO:



**Properties**

- string **Username** `[get, set]`

  *Gets or sets the username for the login request.*
- string **Password** `[get, set]`

  *Gets or sets the password for the login request.*

## 6.21.1 Detailed Description

Represents the data transfer object (DTO) for user login requests.

## 6.21.2 Property Documentation

### 6.21.2.1 Password

`string CovidAPI.Models.LoginRequestDTO.Password [get], [set]`

Gets or sets the password for the login request.

**6.21.2.2 Username**

`string CovidAPI.Models.LoginRequestDTO.Username [get], [set]`

Gets or sets the username for the login request.

The documentation for this class was generated from the following file:

- Models/ **LoginRequestDTO.cs**

## 6.22 PasswordService Class Reference

Service for hashing, verifying passwords, and generating salts using BCrypt.

Inheritance diagram for PasswordService:
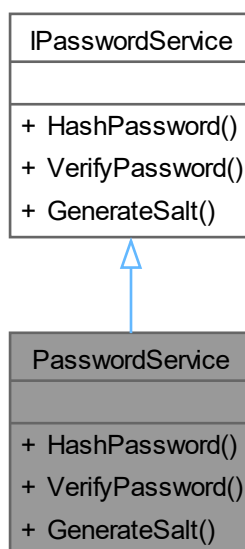
Collaboration diagram for PasswordService:
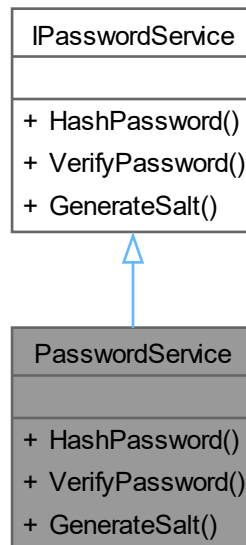
```
           ┌─────────────────────┐
           │   IPasswordService  │
           ├─────────────────────┤
           │                     │
           ├─────────────────────┤
           │ + HashPassword()    │
           │ + VerifyPassword()  │
           │ + GenerateSalt()    │
           └─────────────────────┘
                      △
                      │
           ┌─────────────────────┐
           │   PasswordService   │
           ├─────────────────────┤
           │                     │
           ├─────────────────────┤
           │ + HashPassword()    │
           │ + VerifyPassword()  │
           │ + GenerateSalt()    │
           └─────────────────────┘
```

**Public Member Functions**

- byte[] **HashPassword** (string password, out string salt)

    *Hashes the provided password and generates a salt using BCrypt.*
- bool **VerifyPassword** (string password, byte[] storedHash, string storedSalt)

    *Verifies the provided password against the stored hash and salt using BCrypt.*
- string **GenerateSalt** ()

    *Generates a new salt using BCrypt.*

## 6.22.1 Detailed Description

Service for hashing, verifying passwords, and generating salts using BCrypt.

## 6.22.2 Member Function Documentation

### 6.22.2.1 GenerateSalt()

```
string PasswordService.GenerateSalt ( )
```

Generates a new salt using BCrypt.

**Returns**

    The generated salt in BCrypt format.

Implements **IPasswordService** (p. **??**).

**6.22.2.2 HashPassword()**

```
byte[] PasswordService.HashPassword (
            string password,
            out string salt )
```

Hashes the provided password and generates a salt using BCrypt.

**Parameters**

| | |
|---|---|
| *password* | The password to be hashed. |
| *salt* | The generated salt in BCrypt format. |

**Returns**

The hashed password as a byte array.

Implements **IPasswordService** (p. **??**).

**6.22.2.3 VerifyPassword()**

```
bool PasswordService.VerifyPassword (
            string password,
            byte[] storedHash,
            string storedSalt )
```

Verifies the provided password against the stored hash and salt using BCrypt.

**Parameters**

| | |
|---|---|
| *password* | The password to be verified. |
| *storedHash* | The stored hashed password as a byte array. |
| *storedSalt* | The stored salt in BCrypt format. |

**Returns**

True if the password is verified; otherwise, false.

Implements **IPasswordService** (p. **??**).

The documentation for this class was generated from the following file:

- Services/Rest/ **PasswordService.cs**

## 6.23 Program Class Reference

The entry point class for the application.

Collaboration diagram for Program:

```
┌─────────────────────────────┐
│          Program            │
├─────────────────────────────┤
│                             │
├─────────────────────────────┤
│ + Main()                    │
│ + CreateHostBuilder()       │
└─────────────────────────────┘
```
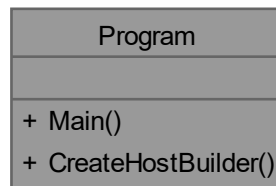
**Static Public Member Functions**

- static void **Main** (string[ ] args)

  *The main entry point for the application.*
- static IHostBuilder **CreateHostBuilder** (string[ ] args)

  *Creates the default host builder for the application.*

## 6.23.1 Detailed Description

The entry point class for the application.

## 6.23.2 Member Function Documentation

### 6.23.2.1 CreateHostBuilder()

```
static IHostBuilder Program.CreateHostBuilder (
            string[] args ) [static]
```

Creates the default host builder for the application.

**Parameters**

| | |
|---|---|
| *args* | Command-line arguments passed to the application. |

**Returns**

The configured host builder.

Here is the caller graph for this function:

| Program.Main | → | Program.CreateHostBuilder |

**6.23.2.2 Main()**

```
static void Program.Main (
            string[] args )  [static]
```

The main entry point for the application.

**Parameters**

| *args* | Command-line arguments passed to the application. |

Here is the call graph for this function:

| Program.Main | → | Program.CreateHostBuilder |

The documentation for this class was generated from the following file:

- **Program.cs**

## 6.24 CovidAPI.Models.RegisterRequestDTO Class Reference

Represents the data transfer object (DTO) for user registration requests.

Collaboration diagram for CovidAPI.Models.RegisterRequestDTO:
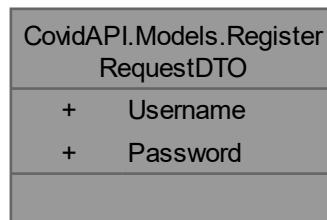


**Properties**

- string **Username** `[get, set]`

  *Gets or sets the username for the registration request.*
- string **Password** `[get, set]`

  *Gets or sets the password for the registration request.*

### 6.24.1 Detailed Description

Represents the data transfer object (DTO) for user registration requests.

### 6.24.2 Property Documentation

#### 6.24.2.1 Password

```
string CovidAPI.Models.RegisterRequestDTO.Password  [get], [set]
```

Gets or sets the password for the registration request.

#### 6.24.2.2 Username

```
string CovidAPI.Models.RegisterRequestDTO.Username  [get], [set]
```

Gets or sets the username for the registration request.

The documentation for this class was generated from the following file:

- Models/ **RegisterRequestDTO.cs**

## 6.25 CovidAPI.Startup Class Reference

Configures the application services and requests during startup.

Collaboration diagram for CovidAPI.Startup:

| CovidAPI.Startup |
| --- |
| + Configuration |
| + Startup() |
| + ConfigureServices() |
| + Configure() |
| + ConfigureLogging() |
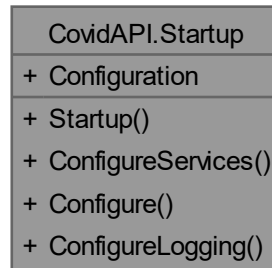
**Public Member Functions**

- **Startup** (IConfiguration configuration)

  *Initializes a new instance of the Startup class.*
- void **ConfigureServices** (IServiceCollection services)

  *Configures the services used by the application.*
- void **Configure** (IApplicationBuilder app, IWebHostEnvironment env)

  *Configures the HTTP request pipeline.*
- void **ConfigureLogging** (IServiceCollection services)

  *Configures logging services for the application.*

**Properties**

- IConfiguration **Configuration**  `[get]`

  *Gets the configuration settings.*

### 6.25.1 Detailed Description

Configures the application services and requests during startup.

### 6.25.2 Constructor & Destructor Documentation

#### 6.25.2.1 Startup()

```
CovidAPI.Startup.Startup (
            IConfiguration configuration )
```

Initializes a new instance of the Startup class.

**Parameters**

| | |
|---|---|
| *configuration* | The configuration settings. |

### 6.25.3 Member Function Documentation

#### 6.25.3.1 Configure()

```
void CovidAPI.Startup.Configure (
            IApplicationBuilder app,
            IWebHostEnvironment env )
```

Configures the HTTP request pipeline.

**Parameters**

| | |
|---|---|
| *app* | The application builder. |
| *env* | The hosting environment. |

Here is the call graph for this function:
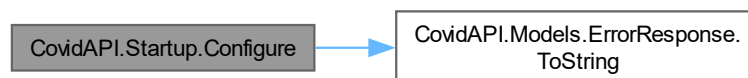


#### 6.25.3.2 ConfigureLogging()

```
void CovidAPI.Startup.ConfigureLogging (
            IServiceCollection services )
```

Configures logging services for the application.

**Parameters**

| | |
|---|---|
| *services* | The service collection. |

#### 6.25.3.3 ConfigureServices()

```
void CovidAPI.Startup.ConfigureServices (
            IServiceCollection services )
```

Configures the services used by the application.

**Parameters**

| | |
|---|---|
| *services* | The service collection. |

### 6.25.4 Property Documentation

#### 6.25.4.1 Configuration

```
IConfiguration CovidAPI.Startup.Configuration  [get]
```

Gets the configuration settings.

The documentation for this class was generated from the following file:

- **Startup.cs**

## 6.26 CovidAPI.Models.User Class Reference

Represents a user entity.

Collaboration diagram for CovidAPI.Models.User:

| CovidAPI.Models.User |
|---|
| + Id |
| + Username |
| + PasswordHash |
| + PasswordSalt |
| |
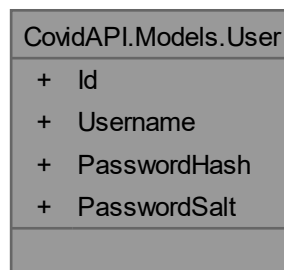
**Properties**

- int **Id** `[get, set]`
  - *Gets or sets the unique identifier for the user.*
- string **Username** `[get, set]`
  - *Gets or sets the username of the user.*
- byte[] **PasswordHash** `[get, set]`
  - *Gets or sets the hash of the user's password.*
- string **PasswordSalt** `[get, set]`
  - *Gets or sets the salt used for password hashing.*

## 6.26.1 Detailed Description

Represents a user entity.

## 6.26.2 Property Documentation

### 6.26.2.1 Id

```
int CovidAPI.Models.User.Id  [get], [set]
```

Gets or sets the unique identifier for the user.

### 6.26.2.2 PasswordHash

```
byte [] CovidAPI.Models.User.PasswordHash  [get], [set]
```

Gets or sets the hash of the user's password.

### 6.26.2.3 PasswordSalt

```
string CovidAPI.Models.User.PasswordSalt  [get], [set]
```

Gets or sets the salt used for password hashing.

### 6.26.2.4 Username

```
string CovidAPI.Models.User.Username  [get], [set]
```

Gets or sets the username of the user.

The documentation for this class was generated from the following file:

- Models/ **User.cs**

## 6.27   UserService Class Reference

Service for user-related operations, including authentication and user retrieval.

Inheritance diagram for UserService:

```
                        ┌─────────────────────────────────┐
                        │           IUserService          │
                        ├─────────────────────────────────┤
                        │                                 │
                        ├─────────────────────────────────┤
                        │ + GetUserByIdAsync()            │
                        │ + GetUserByUsernameAsync()      │
                        │ + CreateUserAsync()             │
                        │ + AuthenticateAsync()           │
                        └─────────────────────────────────┘
                                        △
                                        │
                        ┌─────────────────────────────────┐
                        │           UserService           │
                        ├─────────────────────────────────┤
                        │                                 │
                        ├─────────────────────────────────┤
                        │ + UserService()                 │
                        │ + GetUserByIdAsync()            │
                        │ + GetUserByUsernameAsync()      │
                        │ + CreateUserAsync()             │
                        │ + AuthenticateAsync()           │
                        └─────────────────────────────────┘
```

Collaboration diagram for UserService:

```
┌─────────────────────────────────┐
│           IUserService          │
├─────────────────────────────────┤
│                                 │
├─────────────────────────────────┤
│ + GetUserByIdAsync()            │
│ + GetUserByUsernameAsync()      │
│ + CreateUserAsync()             │
│ + AuthenticateAsync()           │
└─────────────────────────────────┘
                 △
                 │
┌─────────────────────────────────┐
│            UserService          │
├─────────────────────────────────┤
│                                 │
├─────────────────────────────────┤
│ + UserService()                 │
│ + GetUserByIdAsync()            │
│ + GetUserByUsernameAsync()      │
│ + CreateUserAsync()             │
│ + AuthenticateAsync()           │
└─────────────────────────────────┘
```

**Public Member Functions**

- **UserService** ( **ApplicationDbContext** dbContext, **IPasswordService** passwordService)

    *Initializes a new instance of the **UserService** (p. **??**) class.*
- async Task< **User** > **GetUserByIdAsync** (int userId)

    *Gets a user by their unique identifier.*
- async Task< **User** > **GetUserByUsernameAsync** (string username)

    *Gets a user by their username.*
- async Task< **User** > **CreateUserAsync** ( **User** user, string password)

    *Creates a new user with the provided information, including password hashing and salting.*
- async Task< **User** > **AuthenticateAsync** (string username, string password)

    *Authenticates a user based on the provided username and password.*

## 6.27.1   Detailed Description

Service for user-related operations, including authentication and user retrieval.

### 6.27.2 Constructor & Destructor Documentation

#### 6.27.2.1 UserService()

```
UserService.UserService (
            ApplicationDbContext dbContext,
            IPasswordService passwordService )
```

Initializes a new instance of the **UserService** (p. **??**) class.

**Parameters**

| *dbContext* | The application database context. |
| --- | --- |
| *passwordService* | The password service for hashing and verification. |

### 6.27.3 Member Function Documentation

#### 6.27.3.1 AuthenticateAsync()

```
async Task<  User > UserService.AuthenticateAsync (
            string username,
            string password )
```

Authenticates a user based on the provided username and password.

**Parameters**

| *username* | The username of the user. |
| --- | --- |
| *password* | The password to be verified. |

**Returns**

A task representing the asynchronous operation, returning the authenticated user if successful; otherwise, null.

Implements **IUserService** (p. **??**).

Here is the call graph for this function:

### 6.27.3.2 CreateUserAsync()

```
async Task<  User > UserService.CreateUserAsync (
             User user,
            string password )
```

Creates a new user with the provided information, including password hashing and salting.

**Parameters**

| | |
|---|---|
| *user* | The user information. |
| *password* | The plaintext password to be hashed. |

**Returns**

A task representing the asynchronous operation, returning the created user.

Implements **IUserService** (p. **??**).

### 6.27.3.3 GetUserByIdAsync()

```
async Task<  User > UserService.GetUserByIdAsync (
            int userId )
```

Gets a user by their unique identifier.

**Parameters**

| | |
|---|---|
| *user↩ Id* | The user's unique identifier. |

**Returns**

A task representing the asynchronous operation, returning the user if found; otherwise, null.

Implements **IUserService** (p. **??**).

### 6.27.3.4 GetUserByUsernameAsync()

```
async Task<  User > UserService.GetUserByUsernameAsync (
            string username )
```
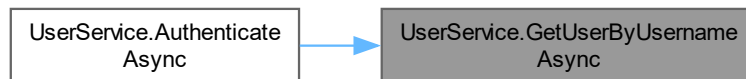
Gets a user by their username.

**Parameters**

| | |
|---|---|
| *username* | The username of the user to retrieve. |

**Returns**

A task representing the asynchronous operation, returning the user if found; otherwise, null.

Implements **IUserService** (p. **??**).

Here is the caller graph for this function:



The documentation for this class was generated from the following file:

- Services/Rest/ **UserService.cs**

# Chapter 7

# File Documentation

## 7.1 Controllers/AuthController.cs File Reference

**Classes**

- class **AuthController**

  *Controller for authentication-related operations.*

## 7.2 Controllers/CovidDataController.cs File Reference

**Classes**

- class **CovidDataController**

  *Controller for COVID-19 data-related operations.*

## 7.3 Data/ApplicationDbContext.cs File Reference

**Classes**

- class **ApplicationDbContext**

  *Represents the database context for the application, providing access to data entities.*

## 7.4 Models/CovidData.cs File Reference

**Classes**

- class **CovidAPI.Models.CovidData**

  *Represents the Covid-19 data stored in the database.*

**Namespaces**

- namespace **CovidAPI**
- namespace **CovidAPI.Models**

## 7.5 Models/CovidDataDTO.cs File Reference

**Classes**

- class **CovidAPI.Models.CovidDataDTO**

    *Represents a Data Transfer Object (DTO) for presenting Covid-19 data.*

**Namespaces**

- namespace **CovidAPI**
- namespace **CovidAPI.Models**

## 7.6 Models/ErrorResponse.cs File Reference

**Classes**

- class **CovidAPI.Models.ErrorResponse**

    *Represents an error response containing information about an error.*

**Namespaces**

- namespace **CovidAPI**
- namespace **CovidAPI.Models**

## 7.7 Models/GeolocationApiResponse.cs File Reference

**Classes**

- class **GeolocationApiResponse**

    *Represents the response from a geolocation API.*
- class **GeolocationResult**

    *Represents a geolocation result.*
- class **GeolocationComponents**

    *Represents the components of a geolocation.*
- class **Geometry**

    *Represents the geometry information of a geolocation.*

## 7.8 Models/JwtSettings.cs File Reference

**Classes**

- class **CovidAPI.Models.JwtSettings**

  *Represents the settings for JSON Web Token (JWT) authentication.*

**Namespaces**

- namespace **CovidAPI**
- namespace **CovidAPI.Models**

## 7.9 Models/LoginRequestDTO.cs File Reference

**Classes**

- class **CovidAPI.Models.LoginRequestDTO**

  *Represents the data transfer object (DTO) for user login requests.*

**Namespaces**

- namespace **CovidAPI**
- namespace **CovidAPI.Models**

## 7.10 Models/RegisterRequestDTO.cs File Reference

**Classes**

- class **CovidAPI.Models.RegisterRequestDTO**

  *Represents the data transfer object (DTO) for user registration requests.*

**Namespaces**

- namespace **CovidAPI**
- namespace **CovidAPI.Models**

## 7.11 Models/User.cs File Reference

**Classes**

- class **CovidAPI.Models.User**

  *Represents a user entity.*

**Namespaces**

- namespace **CovidAPI**
- namespace **CovidAPI.Models**

## 7.12   obj/Debug/net6.0/.NETCoreApp,Version=v6.0.AssemblyAttributes.↵ cs File Reference

## 7.13   obj/Release/net6.0/.NETCoreApp,Version=v6.0.Assembly↵ Attributes.cs File Reference

## 7.14   obj/Debug/net6.0/CovidAPI.AssemblyInfo.cs File Reference

## 7.15   obj/Release/net6.0/CovidAPI.AssemblyInfo.cs File Reference

## 7.16   obj/Debug/net6.0/CovidAPI.GlobalUsings.g.cs File Reference

## 7.17   obj/Release/net6.0/CovidAPI.GlobalUsings.g.cs File Reference

## 7.18   obj/Debug/net6.0/CovidAPI.MvcApplicationPartsAssemblyInfo.cs File Reference

## 7.19   obj/Release/net6.0/CovidAPI.MvcApplicationPartsAssemblyInfo.cs File Reference

## 7.20   Program.cs File Reference

**Classes**

- class **Program**

  *The entry point class for the application.*

## 7.21   Services/Rest/AuthService.cs File Reference

**Classes**

- class **AuthService**

  *Service responsible for user authentication and JWT token generation.*

## 7.22 Services/Rest/CovidDataService.cs File Reference

**Classes**

- class **CovidAPI.Services.Rest.CovidDataService**

    *Service responsible for handling COVID-19 data operations, including fetching, updating, and deleting data.*

**Namespaces**

- namespace **CovidAPI**
- namespace **CovidAPI.Services**
- namespace **CovidAPI.Services.Rest**

## 7.23 Services/Rest/GeolocationService.cs File Reference

**Classes**

- class **GeolocationCache**

    *Represents a cache for storing geolocation data to avoid redundant API calls.*
- class **GeolocationService**

    *Represents a service for retrieving geolocation information for a specific country.*

## 7.24 Services/Rest/IAuthService.cs File Reference

**Classes**

- interface **IAuthService**

    *Defines authentication service methods.*

## 7.25 Services/Rest/ICovidDataService.cs File Reference

**Classes**

- interface **CovidAPI.Services.Rest.ICovidDataService**

    *Defines methods for retrieving and managing COVID-19 data.*

**Namespaces**

- namespace **CovidAPI**
- namespace **CovidAPI.Services**
- namespace **CovidAPI.Services.Rest**

## 7.26   Services/Rest/IGeolocationService.cs File Reference

**Classes**

- interface  **IGeolocationService**

  *Represents a service for retrieving geolocation information related to COVID-19 data.*

## 7.27   Services/Rest/IPasswordService.cs File Reference

**Classes**

- interface  **IPasswordService**

  *Represents a service for hashing, verifying passwords, and generating password salts.*

## 7.28   Services/Rest/IUserService.cs File Reference

**Classes**

- interface  **IUserService**

  *Represents a service for managing user-related operations.*

## 7.29   Services/Rest/PasswordService.cs File Reference

**Classes**

- class  **PasswordService**

  *Service for hashing, verifying passwords, and generating salts using BCrypt.*

## 7.30   Services/Rest/UserService.cs File Reference

**Classes**

- class  **UserService**

  *Service for user-related operations, including authentication and user retrieval.*

## 7.31   Startup.cs File Reference

**Classes**

- class  **CovidAPI.Startup**

  *Configures the application services and requests during startup.*

**Namespaces**

- namespace  **CovidAPI**