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# geograpy3

Aug 20, 2021



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## 1.1 Submodules

## 1.2 geograpy.extraction module

**class** `geograpy.extraction.Extractor` (*text=None, url=None, debug=False*)

Bases: `object`

Extract geo context for text or from url

**find\_entities** (*labels=['GPE', 'GSP', 'PERSON', 'ORGANIZATION']*)

Find entities with the given labels set self.places and returns it :param labels: Labels: The labels to filter

**Returns** List of places

**Return type** list

**find\_geoEntities** ()

Find geographic entities

**Returns** List of places

**Return type** list

**set\_text** ()

Setter for text

**split** (*delimiter=', '*)

simpler regular expression splitter with not entity check

hat tip: <https://stackoverflow.com/a/1059601/1497139>

## 1.3 geograpy.labels module

@author: wf

```
class geograpy.labels.Labels
    Bases: object

    NLTK labels

    default = ['GPE', 'GSP', 'PERSON', 'ORGANIZATION']

    geo = ['GPE', 'GSP']
```

## 1.4 geograpy.locator module

The locator module allows to get detailed city information including the region and country of a city from a location string.

Examples for location strings are:

Amsterdam, Netherlands Vienna, Austria Vienna, IL Paris - Texas Paris TX

the locator will lookup the cities and try to disambiguate the result based on the country or region information found.

The results in string representationa are:

Amsterdam (NH(North Holland) - NL(Netherlands)) Vienna (9(Vienna) - AT(Austria)) Vienna (IL(Illinois) - US(United States)) Paris (TX(Texas) - US(United States)) Paris (TX(Texas) - US(United States))

Each city returned has a city.region and city.country attribute with the details of the city.

Created on 2020-09-18

@author: wf

```
class geograpy.locator.City(**kwargs)
    Bases: geograpy.locator.Location

    a single city as an object

    country

    static fromCityLookup (cityLookupRecord: dict)
        create a city from a cityLookupRecord and setting City, Region and Country while at it :param cityRecord:
        a map derived from the CityLookup view :type cityRecord: dict

    classmethod getSamples ()
```

**region**

**setValue** (name, record)

set a field value with the given name to the given record dicts corresponding entry or none

### Parameters

- **name** (*string*) – the name of the field
- **record** (*dict*) – the dict to get the value from

```
class geograpy.locator.CityManager(name: str = 'CityManager', config: lodstorage.storageconfig.StorageConfig = None, debug=False)
    Bases: geograpy.locator.LocationManager

    a list of cities
```

---

```

classmethod getJsonFiles (config: lodstorage.storageconfig.StorageConfig) → list
    get the list of the json files that have my data

    Returns a list of json file names

    Return type list

class geograpy.locator.Country (lookupSource='sqlDB', **kwargs)
    Bases: geograpy.locator.Location

    a country

    static fromCountryLookup (countryLookupRecord: dict)
        create a region from a regionLookupRecord and setting Region and Country while at it :param region-
        Record: a map derived from the CityLookup view :type regionRecord: dict

    classmethod getSamples ()

class geograpy.locator.CountryManager (name: str = 'CountryManager', config: lod-
                                         storage.storageconfig.StorageConfig = None, de-
                                         bug=False)
    Bases: geograpy.locator.LocationManager

    a list of countries

    classmethod fromErdem ()
        get country list provided by Erdem Ozkol https://github.com/erdem

class geograpy.locator.Earth
    Bases: object

    radius = 6371.0

class geograpy.locator.Location (**kwargs)
    Bases: lodstorage.jsonable.JSONAble

    Represents a Location

balltreeQueryResultToLocationManager (distances, indices, lookupListOfLocations)
    convert the given ballTree Query Result to a LocationManager

    Parameters

    • distances (list) – array of distances

    • indices (list) – array of indices

    • lookupListOfLocations (list) – a list of valid locations to use for lookup

    Returns a list of result Location/distance tuples

    Return type list

distance (other) → float
    calculate the distance to another Location

    Parameters other (Location) – the other location

    Returns the haversine distance in km

classmethod fromRecord (regionRecord: dict)
    create a location from a dict record

    Parameters regionRecord (dict) – the records as returned from a Query

    Returns the corresponding region information

    Return type Region

```

**getLocationsWithinRadius** (*lookupLocationManager*, *radiusKm*: float)

Gives the n closest locations to me from the given `lookupListOfLocations`

**Parameters**

- **lookupLocationManager** (`LocationManager`) – a `LocationManager` object to use for lookup
- **radiusKm** (*float*) – the radius in which to check (in km)

**Returns** a list of result `Location/distance` tuples

**Return type** list

**getNClosestLocations** (*lookupLocationManager*, *n*: int)

Gives a list of up to n locations which have the shortest distance to me as calculated from the given `listOfLocations`

**Parameters**

- **lookupLocationManager** (`LocationManager`) – a `LocationManager` object to use for lookup
- **n** (*int*) – the maximum number of closest locations to return

**Returns** a list of result `Location/distance` tuples

**Return type** list

**classmethod** **getSamples** ()

**static** **haversine** (*lon1*, *lat1*, *lon2*, *lat2*)

Calculate the great circle distance between two points on the earth (specified in decimal degrees)

**isKnownAs** (*name*) → bool

Checks if this location is known under the given name

**Parameters** **name** (*str*) – name the location should be checked against

**Returns** True if the given name is either the name of the location or present in the labels of the location

**static** **mappedDict** (*record*, *keyMapList*: list)

**static** **partialDict** (*record*, *clazz*, *keys*=None)

```
class geograpy.locator.LocationContext (countryManager: geograpy.locator.CountryManager, regionManager: geograpy.locator.RegionManager, cityManager: geograpy.locator.CityManager, config: lodstorage.storageconfig.StorageConfig)
```

Bases: object

Holds `LocationManagers` of all hierarchy levels and provides methods to traverse through the levels

**cities**

**countries**

**db\_filename** = 'locations.db'

**classmethod** **fromCache** (*config*: lodstorage.storageconfig.StorageConfig = None)

Init's a `LocationContext` form `Cache` if existent otherwise init cache

**static** **getDefaultConfig** () → lodstorage.storageconfig.StorageConfig

Returns default `StorageConfig`



**interlinkLocations** (*warnOnDuplicates: bool = True, profile=True*)

Interlinks locations by adding the hierarchy references to the locations

**Parameters** **warnOnDuplicates** (*bool*) – if there are duplicates warn

**load** (*forceUpdate: bool = False, warnOnDuplicates: bool = False*)

load my data

**locateLocation** (*\*locations, verbose: bool = False*)

Get possible locations for the given location names. Current prioritization of the results is city(ordered by population)→region→country ToDo: Extend the ranking of the results e.g. matching of multiple location parts increase ranking :param \*locations: :param verbose: If True combinations of locations names are used to improve the search results. (Increases lookup time) :type verbose: bool

Returns:

**regions**

```
class geograpy.locator.LocationManager(name: str, entityName: str, entityPluralName: str,  
                                       listName: str = None, tableName: str = None,  
                                       clazz=None, primaryKey: str = None, config:  
                                       lodstorage.storageconfig.StorageConfig = None,  
                                       handleInvalidListTypes=True, filterInvalidList-  
                                       Types=False, debug=False)
```

Bases: lodstorage.entity.EntityManager

a list of locations

**add** (*location*)

add the given location to me

**Parameters** **location** (*object*) – the location to be added and put in my hash map

**static downloadBackupFile** (*url: str, fileName: str, targetDirectory: str = None, force: bool = False*)

Downloads from the given url the zip-file and extracts the file corresponding to the given fileName.

**Parameters**

- **url** – url linking to a downloadable gzip file
- **fileName** – Name of the file that should be extracted from gzip file
- **targetDirectory** (*str*) – download the file this directory
- **force** (*bool*) – True if the download should be forced

**Returns** Name of the extracted file with path to the backup directory

**classmethod downloadBackupFileFromGitHub** (*fileName: str, targetDirectory: str = None*)

download the given fileName from the github data directory

**Parameters**

- **fileName** (*str*) – the filename to download
- **targetDirectory** (*str*) – download the file this directory

**Returns** the local file

**Return type** str

**fromCache** (*force=False, getListOfDicts=None, sampleRecordCount=-1*)

get me from the cache

**static getBackupDirectory** ()

**getBallTuple** (*cache: bool = True*)

get the BallTuple=BallTree,validList of this location list

**Parameters**

- **cache** (*bool*) – if True calculate and use a cached version otherwise recalculate on
- **call of this function** (*every*) –

**Returns** a sklearn.neighbors.BallTree for the given list of locations, list: the valid list of locations list: valid list of locations

**Return type** BallTree,list

**getByName** (*\*names*)

Get locations matching given names :param name: Name of the location

**Returns** Returns locations that match the given name

**getLocationByID** (*wikidataID: str*)

Returns the location object that corresponds to the given location

**Parameters** **wikidataID** – wikidataid of the location that should be returned

**Returns** Location object

**getLocationByIsoCode** (*isoCode: str*)

Get possible locations matching the given isoCode :param isoCode: isoCode of possible Locations

**Returns** List of wikidata ids of locations matching the given isoCode

**getLocationsByWikidataId** (*\*wikidataId*)

Returns Location objects for the given wikidataids :param \*wikidataId: wikidataIds of the locations that should be returned :type \*wikidataId: str

**Returns** Location objects matching the given wikidataids

**class** geograpy.locator.**Locator** (*db\_file=None, correctMisspelling=False, storageConfig: lod-storage.storageconfig.StorageConfig = None, debug=False*)

Bases: object

location handling

**cities\_for\_name** (*cityName*)

find cities with the given cityName

**Parameters** **cityName** (*string*) – the potential name of a city

**Returns** a list of city records

**correct\_country\_misspelling** (*name*)

correct potential misspellings :param name: the name of the country potentially misspelled :type name: string

**Returns** correct name of unchanged

**Return type** string

**createViews** (*sqlDB*)

**db\_has\_data** ()

check whether the database has data / is populated

**Returns** True if the cities table exists and has more than one record

**Return type** boolean

**db\_recordCount** (*tableList, tableName*)

count the number of records for the given tableName

**Parameters**

- **tableList** (*list*) – the list of table to check
- **tableName** (*str*) – the name of the table to check

**Returns** int: the number of records found for the table

**disambiguate** (*country, regions, cities, byPopulation=True*)

try determining country, regions and city from the potential choices

**Parameters**

- **country** (*Country*) – a matching country found
- **regions** (*list*) – a list of matching Regions found
- **cities** (*list*) – a list of matching cities found

**Returns** the found city or None

**Return type** *City*

**downloadDB** ()

download my database

**getAliases** ()

get the aliases hashTable

**getCountry** (*name*)

get the country for the given name :param name: the name of the country to lookup :type name: string

**Returns** the country if one was found or None if not

**Return type** country

**static getInstance** (*correctMisspelling=False, debug=False*)

get the singleton instance of the Locator. If parameters are changed on further calls the initial parameters will still be in effect since the original instance will be returned!

**Parameters**

- **correctMisspelling** (*bool*) – if True correct typical misspellings
- **debug** (*bool*) – if True show debug information

**getView** ()

get the view to be used

**Returns** the SQL view to be used for CityLookups e.g. CityLookup

**Return type** str

**static isISO** (*s*)

check if the given string is an ISO code (ISO 3166-2 code) see <https://www.wikidata.org/wiki/Property:P300>

**Returns** True if the string might be an ISO Code as per a regexp check

**Return type** bool

**is\_a\_country** (*name*)

check if the given string name is a country

**Parameters** **name** (*string*) – the string to check

**Returns** if pycountry thinks the string is a country

**Return type** `True`

**locateCity** (*places: list*)

locate a city, region country combination based on the given wordtoken information

**Parameters**

- **places** (*list*) – a list of places derived by splitting a locality e.g. “San Francisco, CA”
- **to** “**San Francisco**”, “**CA**” (*leads*) –

**Returns** a city with country and region details

**Return type** *City*

**locator** = `None`

**normalizePlaces** (*places: list*)

normalize places

**Parameters** **places** (*list*) –

**Returns** stripped and aliased list of places

**Return type** `list`

**places\_by\_name** (*placeName, columnName*)

get places by name and column :param placeName: the name of the place :type placeName: `string` :param columnName: the column to look at :type columnName: `string`

**populate\_Cities** (*sqlDB*)

populate the given sqlDB with the Wikidata Cities

**Parameters** **sqlDB** (*SQLDB*) – target SQL database

**populate\_Countries** (*sqlDB*)

populate database with countries from wikiData

**Parameters** **sqlDB** (*SQLDB*) – target SQL database

**populate\_Regions** (*sqlDB*)

populate database with regions from wikiData

**Parameters** **sqlDB** (*SQLDB*) – target SQL database

**populate\_Version** (*sqlDB*)

populate the version table

**Parameters** **sqlDB** (*SQLDB*) – target SQL database

**populate\_db** (*force=False*)

populate the cities SQL database which caches the information from the GeoLite2-City-Locations.csv file

**Parameters** **force** (*bool*) – if True force a recreation of the database

**readCSV** (*fileName: str*)

read the given CSV file

**Parameters** **fileName** (*str*) – the filename to read

**recreateDatabase** ()

recreate my lookup database

```

regions_for_name (region_name)
    get the regions for the given region_name (which might be an ISO code)

    Parameters region_name (string) – region name

    Returns the list of cities for this region

    Return type list

static resetInstance ()

class geograpy.locator.Region (**kwargs)
    Bases: geograpy.locator.Location
    a Region (Subdivision)

    country

    static fromRegionLookup (regionLookupRecord: dict)
        create a region from a regionLookupRecord and setting Region and Country while at it :param region-
        Record: a map derived from the CityLookup view :type regionRecord: dict

    classmethod getSamples ()

class geograpy.locator.RegionManager (name: str = 'RegionManager', config: lodstorage.storageconfig.StorageConfig = None, debug=False)
    Bases: geograpy.locator.LocationManager
    a list of regions

geograpy.locator.main (argv=None)
    main program.

```

## 1.5 geograpy.places module

```

class geograpy.places.PlaceContext (place_names: list, setAll: bool = True, correctMisspelling: bool = False)
    Bases: geograpy.locator.Locator
    Adds context information to a place name

    getRegions (countryName: str) → list
        get a list of regions for the given countryName
        countryName(str): the countryName to check

    get_region_names (countryName: str) → list
        get region names for the given country
        Parameters countryName (str) – the name of the country

    setAll ()
        Set all context information

    set_cities ()
        set the cities information

    set_countries ()
        get the country information from my places

    set_other ()

```

```
set_regions()
```

get the region information from my places (limited to the already identified countries)

## 1.6 geograpy.prefixtree module

## 1.7 geograpy.utils module

```
class geograpy.utils.Download
```

Bases: object

Utility functions for downloading data

```
static getFileContent (path: str)
```

```
static getURLContent (url: str)
```

```
static needsDownload (filePath: str, force: bool = False) → bool
```

check if a download of the given filePath is necessary that is the file does not exist has a size of zero or the download should be forced

### Parameters

- **filePath** (*str*) – the path of the file to be checked
- **force** (*bool*) – True if the result should be forced to True

**Returns** True if a download for this file needed

**Return type** bool

```
class geograpy.utils.Profiler (msg, profile=True)
```

Bases: object

simple profiler

```
time (extraMsg="")
```

time the action and print if profile is active

```
geograpy.utils.fuzzy_match (s1, s2, max_dist=0.8)
```

Fuzzy match the given two strings with the given maximum distance jellyfish jaro\_winkler\_similarity based on [https://en.wikipedia.org/wiki/Jaro-Winkler\\_distance](https://en.wikipedia.org/wiki/Jaro-Winkler_distance) :param s1: string: First string :param s2: string: Second string :param max\_dist: float: The distance - default: 0.8

**Returns** True if the match is greater equals max\_dist. Otherwise false

```
geograpy.utils.remove_non_ascii (s)
```

Remove non ascii chars from the given string :param s: string: The string to remove chars from

**Returns** The result string with non-ascii chars removed

**Return type** string

Hat tip: <http://stackoverflow.com/a/1342373/2367526>

## 1.8 geograpy.wikidata module

Created on 2020-09-23

@author: wf

---

```

class geograpy.wikidata.Wikidata (endpoint='https://query.wikidata.org/sparql', profile: bool =
                                True)
    Bases: object
    Wikidata access

    getCities (limit=1000000)
        get all human settlements as list of dict with duplicates for label, region, country ...

    getCitiesForRegion (regionId, msg)
        get the cities for the given Region

    getCityStates (limit=None)
        get Regions from Wikidata

    try query

    static getCoordinateComponents (coordinate: str) -> (<class 'float'>, <class 'float'>)
        Converts the wikidata coordinate representation into its subcomponents longitude and latitude Example:
        'Point(-118.25 35.05694444)' results in ('-118.25' '35.05694444')

        Parameters coordinate – coordinate value in the format as returned by wikidata queries

        Returns Returns the longitude and latitude of the given coordinate as separate values

    getCountries (limit=None)
        get a list of countries

    try query

    getRegions (limit=None)
        get Regions from Wikidata

    try query

    static getValuesClause (varName: str, values, wikidataEntities: bool = True)
        generates the SPARQL value clause for the given variable name containing the given values :param var-
        Name: variable name for the ValuesClause :param values: values for the clause :param wikidataEntities:
        if true the wikidata prefix is added to the values otherwise it is expected taht the given values are proper
        IRIs :type wikidataEntities: bool

        Returns str

    static getWikidataId (wikidataURL: str)
        Extracts the wikidata id from the given wikidata URL

        Parameters wikidataURL – wikidata URL the id should be extracted from

        Returns The wikidata id if present in the given wikidata URL otherwise None

    query (msg, queryString: str, limit=None) → list
        get the query result

        Parameters

        • msg (str) – the profile message to display

        • queryString (str) – the query to execute

        Returns the list of dicts with the result

        Return type list

    store2DB (lod, tableName: str, primaryKey: str = None, sqlDB=None)
        store the given list of dicts to the database

        Parameters

```

- **lod** (*list*) – the list of dicts
- **tableName** (*str*) – the table name to use
- **primaryKey** (*str*) – primary key (if any)
- **sqlDB** (*SQLDB*) – target SQL database

## 1.9 Module contents

main geograpy 3 module

`geograpy.get_geoPlace_context (url=None, text=None, debug=False)`

Get a place context for a given text with information about country, region, city and other based on NLTK Named Entities having the Geographic(GPE) label.

### Parameters

- **url** (*String*) – the url to read text from (if any)
- **text** (*String*) – the text to analyze
- **debug** (*boolean*) – if True show debug information

**Returns** PlaceContext: the place context

**Return type** places

`geograpy.get_place_context (url=None, text=None, labels=['GPE', 'GSP', 'PERSON', 'ORGANIZATION'], debug=False)`

Get a place context for a given text with information about country, region, city and other based on NLTK Named Entities in the label set Geographic(GPE), Person(PERSON) and Organization(ORGANIZATION).

### Parameters

- **url** (*String*) – the url to read text from (if any)
- **text** (*String*) – the text to analyze
- **debug** (*boolean*) – if True show debug information

**Returns** PlaceContext: the place context

**Return type** pc

`geograpy.locateCity (location, correctMisspelling=False, debug=False)`

locate the given location string :param location: the description of the location :type location: string

**Returns** the location

**Return type** *Locator*



## CHAPTER 2

---

setup module

---



## 3.1 Submodules

## 3.2 tests.test\_extractor module

```
class tests.test_extractor.TestExtractor (methodName='runTest')
    Bases: tests.basetest.Geograpy3Test
    test Extractor

    check (places, expectedList)
        check the places for begin non empty and having at least the expected List of elements

        Parameters
        • places (Places) – the places to check
        • expectedList (list) – the list of elements to check

    testExtractorFromText ()
        test different texts for getting geo context information

    testExtractorFromUrl ()
        test the extractor

    testGeograpyIssue32 ()
        test https://github.com/ushahidi/geograpy/issues/32

    testGetGeoPlace ()
        test geo place handling

    testIssue10 ()
        test https://github.com/somnathrakshit/geograpy3/issues/10 Add ISO country code

    testIssue7 ()
        test https://github.com/somnathrakshit/geograpy3/issues/7 disambiguating countries
```

```
testIssue9 ()
    test https://github.com/somnathrakshit/geograpy3/issues/9 [BUG]AttributeError: 'NoneType' object has
    no attribute 'name' on "Pristina, Kosovo"

testStackoverflow54721435 ()
    see https://stackoverflow.com/questions/54721435/unable-to-extract-city-names-from-a-text-using-geograpypython

testStackoverflow43322567 ()
    see https://stackoverflow.com/questions/43322567

testStackoverflow54077973 ()
    see https://stackoverflow.com/questions/54077973/geograpy3-library-for-extracting-the-locations-in-the-text-gives-unicode

testStackoverflow54712198 ()
    see https://stackoverflow.com/questions/54712198/not-only-extracting-places-from-a-text-but-also-other-names-in-geograp

testStackoverflow55548116 ()
    see https://stackoverflow.com/questions/55548116/geograpy3-library-is-not-working-properly-and-give-traceback-error

testStackoverflow62152428 ()
    see https://stackoverflow.com/questions/62152428/extracting-country-information-from-description-using-geograpy?noredirect=1#comment112899776\_62152428
```

### 3.3 tests.test\_locator module

Created on 2020-09-19

@author: wf

```
class tests.test_locator.TestLocator (methodName='runTest')
    Bases: tests.basetest.Geograpy3Test

    test the Locator class from the location module

    checkExamples (examples, countries, debug=False, check=True)
        check that the given example give results in the given countries :param examples: a list of example location
        strings :type examples: list :param countries: a list of expected country iso codes :type countries: list

    checkExpected (lod, expected)

    lookupQuery (viewName, whereClause)

    testCityLookup ()
        test the cityLookup to city/region/country object cluster

    testCountryLookup ()
        test country Lookup

    testDelimiters ()
        test the delimiter statistics for names

    testExamples ()
        test examples

    testGetCountry ()
        test getting a country by name or ISO

    testHasViews ()
        test that the views are available

    testIsoRegexp ()
        test regular expression for iso codes
```

```

testIssue15 ()
    https://github.com/somnathrakshit/geograpy3/issues/15 test Issue 15 Disambiguate via population, gdp
    data

testIssue17 ()
    test issue 17:

    https://github.com/somnathrakshit/geograpy3/issues/17

    [BUG] San Francisco, USA and Auckland, New Zealand should be locatable #17

testIssue19 ()
    test issue 19

testIssue22 ()
    https://github.com/somnathrakshit/geograpy3/issues/22

testIssue41_CountriesFromErdem ()
    test getting Country list from Erdem

testIssue_42_distance ()
    test haversine and location

testProceedingsExample ()
    test a proceedings title Example

testRegionLookup ()
    test region Lookup

testStackOverflow64379688 ()
    compare old and new geograpy interface

testStackOverflow64418919 ()
    https://stackoverflow.com/questions/64418919/problem-retrieving-region-in-us-with-geograpy3

testUML ()
    test adding population data from wikidata to GeoLite2 information

testWordCount ()
    test the word count

```

### 3.4 tests.test\_places module

```

class tests.test_places.TestPlaces (methodName='runTest')
    Bases: tests.basetest.Geograpy3Test

    test Places

    setUp ()
        setUp test environment

    testGetRegionNames ()
        test getting region names

    testIssue25 ()
        https://github.com/somnathrakshit/geograpy3/issues/25

    testIssue49 ()
        country recognition

    testPlaces ()
        test places

```

## 3.5 tests.test\_prefixtree module

## 3.6 tests.test\_wikidata module

Created on 2020-09-23

@author: wf

```
class tests.test_wikidata.TestWikidata (methodName='runTest')
    Bases: tests.basetest.Geograpy3Test

    test the wikidata access for cities

    testGetCoordinateComponents ()
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