rnet

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CHAPTER

ONE

DATA

1.1 Classes

1.1.1 The MapData Class

class rnet.**MapData**(*vertices*, *links*, ***, *crs*, *name*)

Bases: rnet.data.classes.Data

Class for representing map data.

Parameters

- **vertices** (pandas.DataFrame) – Frame containing vertex data.
- **links** (pandas.DataFrame) – Frame containing link data.

Keyword Arguments

- **crs** (int) – EPSG code of the CRS in which vertex coordinates are represented.
- **name** (str) – Data source name.

bounds()

Return the coordinates that define the bounding box for the set of vertices.

Return type Tuple[float]

classmethod from_osm(*path_to_osm*, ***kwargs*)

Instantiate class from an OSM file.

Parameters

- **path_to_osm** (str) – Path to OSM file.
- **name** (str, optional) – Data source name. If unspecified, then the OSM file name is used.

Keyword Arguments

- **include** (List[str], optional) – List of tags to include. All tags are included by default.
- **exclude** (List[str], optional) – List of tags to exclude. No tags are excluded by default.

Note: If required, either the *include* or *exclude* keyword should be given, not both. In the case that both are given, *include* takes precedence and *exclude* is ignored.

out(**, crs=None, include='all', exclude=None*)

Export vertex and link data frames.

Keyword Arguments

- **crs** (`int`, optional) – EPSG code of CRS for vertex coordinates. If different from `.crs`, coordinates are transformed to *crs*. If None, coordinates are not transformed. Default: None.
- **include** (*'all'* or `List[str]`, optional) – List of tags to include. If 'all', all tags are included. Default: 'all'.
- **exclude** (`List[str]`, optional) – List of tags to exclude. If None, no tags are excluded. Default: None.

Returns 2-tuple containing `.vertices` and `.links` frames with links filtered and vertices transformed.

Return type Tuple[pandas.DataFrame, pandas.DataFrame]

Note: The keyword *include* takes precedence over *exclude*.

1.1.2 The ElevationData Class

class rnet.**ElevationData**(*df, *, crs, name*)

Bases: `rnet.data.classes.Data`

Class for representing elevation data.

get_elev(*x, y, *, r=50, p=2*)

Returns elevation at a single point. The elevation is computed via inverse distance weighting (IDW) interpolation.

Parameters

- **x** (`float`) – *x*-coordinate.
- **y** (`float`) – *y*-coordinate.

Keyword Arguments

- **r** (`float`, optional) – Radius for neighbor search. Default: 50.
- **p** (`int`, optional) – Power setting. Default: 2.

Return type float

See also:

`get_elevs()` Returns elevations at multiple points.

get_elevs(*points, *, r=50, p=2*)

Returns elevations at multiple points. The elevations are computed via inverse distance weighting (IDW) interpolation.

Parameters **points** (`numpy.ndarray`, shape(N,2)) – The N points at which to compute elevations.

Keyword Arguments

- **r** (`float`, optional) – Radius for neighbor search. Default: 50.
- **p** (`int`, optional) – Power setting. Default: 2.

Return type List[float]

> **Warning:** Points that are outside of the data bounds will return a corresponding elevation value of `numpy.nan`.

See also:

`get_elev()` Returns elevation at a single point.

`out`(***, *crs=None*)

Exports point data frame.

Keyword Arguments **`crs`** (`int`, optional) – EPSG code of CRS for point coordinates. If different from `.crs`, coordinates are transformed to *crs*. If None, coordinates are not transformed. Default: None.

Returns `.df` frame with coordinates transformed.

Return type pandas.DataFrame

1.2 Containers

1.2.1 The MapDataContainer Class

`class rnet.`**`MapDataContainer`**(*name=None*)

Bases: `rnet.data.containers.DataContainer`

Container for map data.

`add`(*source*, *crs=None*)

Adds map data to the container.

Parameters

- **`source`** (`str` or `MapData`) – Either (1) path to OSM file, (2) path to directory containing `vertices.csv` and `links.csv` pair, or (3) `MapData` instance.
- **`crs`** (`int`, optional) – EPSG code of the CRS in which vertex coordinates are represented. Required only if *source* is of type (2).

`out`(***, *assume_unique=False*, *crs=4326*, *include='all'*, *exclude=None*)

Creates a `MapData` instance containing concatenated frames.

Keyword Arguments

- **`assume_unique`** (`bool`, optional) – If True, vertices and links in all data sources are assumed to be unique. If False, data sources are checked for uniqueness and only unique features are retained. Default: False.
- **`crs`** (`int`, optional) – EPSG code of CRS for vertex coordinates. Default: 4326.
- **`include`** (*‘all’* or `List[str]`, optional) – List of tags to include. If ‘all’, all tags are included. Default: ‘all’.

- **exclude** (List[str], optional) – List of tags to exclude. If None, no tags are excluded. Default: None.

Returns MapData instance.

Return type *MapData*

See also:

MapData Class for representing map data.

1.2.2 The ElevaitonDataContainer Class

class rnet.**ElevationDataContainer**(*name=None*)

Bases: rnet.data.containers.DataContainer

Container for elevation data.

add(*source*, *crs=None*)

Adds elevation data to the container.

Parameters

- **source** (str or ElevationData) – Either (1) path to TIF file, (2) path to CSV file, or (3) ElevationData instance.
- **crs** (int, optional) – EPSG code of the CRS in which point coordinates are represented. Required only if *source* is of type (2).

out(**, *assume_unique=False*, *crs=4326*)

Creates an ElevationData instance containing concatenated frames.

Keyword Arguments

- **assume_unique** (bool, optional) – If True, points in all data sources are assumed to be unique. If False, data sources are checked for uniqueness and only unique features are retained. Default: False.
- **crs** (int, optional) – EPSG code of CRS for (x, y) coordinates. Default: 4326.

Returns ElevationData instance.

Return type *ElevationData*

See also:

ElevationData Class for representing elevation data.