Package 'pct'

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Type Package

Title Propensity to Cycle Tool

Version 0.4.1

Description Functions and example data to teach and
increase the reproducibility of the methods and code underlying
the Propensity to Cycle Tool (PCT), a research project and web application
hosted at <https://www.pct.bike/>.
For an academic paper on the methods,
see Lovelace et al (2017) <doi:10.5198/jtlu.2016.862>.

Depends R (>= 3.5.0)

License GPL-3

URL <https://itsleeds.github.io/pct/>, <https://github.com/ITSLeeds/pct>

BugReports <https://github.com/ITSLeeds/pct/issues>

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R topics documented:

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desire_lines_leeds   *Cycle route desire lines for Leeds*

Description

Cycle route desire lines for Leeds

Examples

```
# see data-raw folder for generation code
desire_lines_leeds
```

---

get_centroids_ew   *Download MSOA centroids for England and Wales*

Description

Downloads and processes data on where people live in England and Wales. See geoportal.statistics.gov.uk.

Usage

```
get_centroids_ew()
```

Examples

```
pwc = get_centroids_ew()
plot(pwc[sample(nrow(pwc), 1000), ])
```

---

get_desire_lines   *Desire lines*

Description

This function generates "desire lines" from census 2011 data. By default gets all desire lines from census in region, but can get the top n.

Usage

```
get_desire_lines(region = NULL, n = NULL, omit_intrazonal = FALSE)
```

Arguments

region	The PCT region or local authority to download data from (e.g. `west-yorkshire` or `Leeds`). See `View(pct_regions_lookup)` for a full list of possible region names.
n	top n number of destinations with most trips in the 2011 census within the `region`.
omit_intrazonal	
	should intrazonal OD pairs be omited from result? `FALSE` by default.

Examples

```
desire_lines = get_desire_lines("wight")
plot(desire_lines)
intra_zonal = desire_lines$geo_code1 == desire_lines$geo_code2
plot(desire_lines[intra_zonal, ])
```

---

get_od   *Get origin destination data from the 2011 Census*

Description

This function downloads a .csv file representing movement between MSOA zones in England and
Wales. By default it returns national data, but region can be set to subset the output to a specific
local authority or region.

Usage

```
get_od(region = NULL, n = NULL, type = "within", omit_intrazonal = FALSE)
```

Arguments

region   The PCT region or local authority to download data from (e.g. west-yorkshire
                or Leeds). See View(pct_regions_lookup) for a full list of possible region
                names.

n   top n number of destinations with most trips in the 2011 census within the
                region.

type   the type of subsetting: one of from, to or within, specifying how the od dataset
                should be subset in relation to the region.

omit_intrazonal
                should intrazonal OD pairs be omited from result? FALSE by default.

Examples

```
get_od("wight", n = 3)
```

---

get_pct   *Generic function to get regional data from the PCT*

Description

This function gets data generated for the Propensity to Cycle Tool project and returns objects in the
modern sf class.

Usage

```
get_pct(
  base_url = "https://github.com/npct/pct-outputs-regional-notR/raw/master",
  purpose = "commute",
  geography = "msoa",
  region = NULL,
  layer = NULL,
  extension = ".geojson",
  national = FALSE
)
```

Arguments

base_url	Where the data is stored.
purpose	Trip purpose (typically `school` or `commute`)
geography	Geographic resolution of outputs (`msoa` or `lsoa`)
region	The PCT region or local authority to download data from (e.g. `west-yorkshire` or `Leeds`). See `View(pct_regions_lookup)` for a full list of possible region names.
layer	The PCT layer of interest, z, c, l, rf, rq or rnet for zones, centroids, desire lines, routes (fast or quiet) and route networks, respectively
extension	The type of file to download (only `.geojson` supported at present)
national	Download nationwide data? `FALSE` by default

Examples

```
rf = get_pct(region = "isle-of-wight", layer = "rf")
names(rf)[1:20]
vars_to_plot = 10:13
plot(rf[vars_to_plot])
z = get_pct(region = "isle-of-wight", layer = "z")

rf = get_pct(region = "west-yorkshire", layer = "rf")
z_all = get_pct(layer = "z", national = TRUE)
```

---

get_pct_centroids   *Get centroid results from the PCT*

Description

Wrapper around [get_pct()] that gets centroid data from the PCT.

Usage

```
get_pct_centroids(
  region = NULL,
  purpose = "commute",
  geography = "msoa",
  extension = ".geojson"
)
```

Arguments

region	The PCT region or local authority to download data from (e.g. `west-yorkshire` or `Leeds`). See `View(pct_regions_lookup)` for a full list of possible region names.
purpose	Trip purpose (typically `school` or `commute`)
geography	Geographic resolution of outputs (`msoa` or `lsoa`)
extension	The type of file to download (only `.geojson` supported at present)

Examples

```
z = get_pct_centroids("isle-of-wight")
plot(z)
```

---

get_pct_lines	*Get desire lines results from the PCT*

Description

Wrapper around [get_pct()] that gets l (lines) data from the PCT.

Usage

```
get_pct_lines(
  region = NULL,
  purpose = "commute",
  geography = "msoa",
  extension = ".geojson"
)
```

Arguments

region	The PCT region or local authority to download data from (e.g. `west-yorkshire` or `Leeds`). See `View(pct_regions_lookup)` for a full list of possible region names.
purpose	Trip purpose (typically `school` or `commute`)
geography	Geographic resolution of outputs (`msoa` or `lsoa`)
extension	The type of file to download (only `.geojson` supported at present)

Examples

```
z = get_pct_lines("isle-of-wight")
plot(z)
```

---

get_pct_rnet *Get road network results from the PCT*

Description

Wrapper around [get_pct()] that gets centroid data from the PCT.

Usage

```
get_pct_rnet(
  region = NULL,
  purpose = "commute",
  geography = "msoa",
  extension = ".geojson"
)
```

Arguments

region	The PCT region or local authority to download data from (e.g. west-yorkshire or Leeds). See View(pct_regions_lookup) for a full list of possible region names.
purpose	Trip purpose (typically school or commute)
geography	Geographic resolution of outputs (msoa or lsoa)
extension	The type of file to download (only .geojson supported at present)

Examples

```
rnet = get_pct_rnet("isle-of-wight")
plot(rnet)
```

---

get_pct_routes_fast *Get fast road network results from the PCT*

Description

Wrapper around [get_pct()] that gets rf data from the PCT.

Usage

```
get_pct_routes_fast(
  region = NULL,
  purpose = "commute",
  geography = "msoa",
  extension = ".geojson"
)
```

Arguments

region	The PCT region or local authority to download data from (e.g. `west-yorkshire` or `Leeds`). See `View(pct_regions_lookup)` for a full list of possible region names.
purpose	Trip purpose (typically `school` or `commute`)
geography	Geographic resolution of outputs (`msoa` or `lsoa`)
extension	The type of file to download (only `.geojson` supported at present)

Examples

```
z = get_pct_routes_fast("isle-of-wight")
plot(z)
```

---

get_pct_routes_quiet   *Get quiet road network results from the PCT*

Description

Wrapper around [get_pct()] that gets rq data from the PCT.

Usage

```
get_pct_routes_quiet(
  region = NULL,
  purpose = "commute",
  geography = "msoa",
  extension = ".geojson"
)
```

Arguments

region	The PCT region or local authority to download data from (e.g. `west-yorkshire` or `Leeds`). See `View(pct_regions_lookup)` for a full list of possible region names.
purpose	Trip purpose (typically `school` or `commute`)
geography	Geographic resolution of outputs (`msoa` or `lsoa`)
extension	The type of file to download (only `.geojson` supported at present)

Examples

```
z = get_pct_routes_quiet("isle-of-wight")
plot(z)
```

---

get_pct_zones   *Get zone results from the PCT*

Description

Wrapper around [get_pct()] that gets zone data from the PCT.

Usage

```
get_pct_zones(
  region = NULL,
  purpose = "commute",
  geography = "msoa",
  extension = ".geojson"
)
```

Arguments

region	The PCT region or local authority to download data from (e.g. `west-yorkshire` or `Leeds`). See `View(pct_regions_lookup)` for a full list of possible region names.
purpose	Trip purpose (typically `school` or `commute`)
geography	Geographic resolution of outputs (`msoa` or `lsoa`)
extension	The type of file to download (only `.geojson` supported at present)

Examples

```
z = get_pct_zones("isle-of-wight")
plot(z)
```

---

leeds_uber_sample   *Top 15 min mean journy times within Leeds from Uber*

Description

Data downloaded 4th March 2019. According to Uber, the dataset is from: 1/1/2018 - 1/31/2018 (Every day, Daily Average)

Examples

```
# see data-raw folder for generation code
leeds_uber_sample
```

---

mode_names   *Mode names in the Census*

Description

And conversion into R-friendly versions

Examples

```
mode_names
```

---

od_leeds   *Example OD data for Leeds*

Description

od_leeds contains the 100 most travelled work desire lines in Leeds, according to the 2011 Census.

Examples

```
# see data-raw folder for generation code
od_leeds
```

---

pct_regions   *PCT regions from www.pct.bike*

Description

See data-raw folder for generation code

Examples

```
pct_regions
```

---

pct_regions_lookup   *Lookup table matching PCT regions to local authorities*

Description

For matching pct_regions object with local authority names in England and Wales.

Examples

```
names(pct_regions_lookup)
head(pct_regions_lookup)
```

---

rnet_leeds *Route network for Leeds*

Description

Route network for Leeds

Examples

```
# see data-raw folder for generation code
rnet_leeds
```

---

routes_fast_leeds *Fastest cycle routes for the desire_lines_leeds*

Description

Fastest cycle routes for the desire_lines_leeds

Examples

```
# see data-raw folder for generation code
routes_fast_leeds
```

---

santiago_lines *Desire lines in central Santiago*

Description

See https://github.com/pedalea/pctSantiago folder for generation code

Examples

```
# u = "https://github.com/pedalea/pctSantiago/releases/download/0.0.1/od_agg_zone_sub.Rds"
# download.file(u, destfile = "od_agg_zone_sub.Rds")
# desire_lines = readRDS("od_agg_zone_sub.Rds")
santiago_zones
```

---

santiago_od   *OD data in central Santiago*

Description

See https://github.com/pedalea/pctSantiago folder for generation code

Examples

```
# u = "https://github.com/pedalea/pctSantiago/releases/download/0.0.1/santiago_od.Rds"
# download.file(u, destfile = "santiago_od.Rds", mode = "wb")
# santiago_od = readRDS("santiago_od.Rds")
santiago_od
```

---

santiago_routes_cs   *200 cycle routes in central Santiago, Chile*

Description

This data was obtained using code shown in the International application of the PCT methods [vignette](#).

Examples

```
names(santiago_routes_cs)
head(santiago_routes_cs)
plot(santiago_routes_cs)
```

---

santiago_zones   *Zones in central Santiago*

Description

See https://github.com/pedalea/pctSantiago folder for generation code

Examples

```
# u = "https://github.com/pedalea/pctSantiago/releases/download/0.0.1/z_centre.Rds"
# download.file(u, destfile = "z_centre.Rds", mode = "wb")
# santiago_zones = readRDS("z_centre.Rds")
santiago_zones
```

uptake_pct_godutch   *Calculate cycling uptake for UK 'Go Dutch' scenario*

Description

See uptake_pct_govtarget().

Usage

```
uptake_pct_godutch(
  distance,
  gradient,
  alpha = -3.959,
  d1 = -0.5963,
  d2 = 1.832,
  d3 = 0.007956,
  h1 = -0.2872,
  i1 = 0.01784,
  i2 = -0.0977
)
```

Arguments

distance	Vector distance numeric values of routes.
gradient	Vector gradient numeric values of routes.
alpha	The intercept
d1	Distance term 1
d2	Distance term 2
d3	Distance term 3
h1	Hilliness term 1
i1	document!
i2	document!

Examples

```
l = routes_fast_leeds
pcycle_scenario = uptake_pct_godutch(l$length, l$av_incline)
plot(l$length, pcycle_scenario)
```

---

uptake_pct_govtarget   *Calculate cycling uptake for UK 'Government Target' scenario*

Description

Uptake model that takes distance and hilliness and returns a percentage of people likely to cycle along a desire line. Source: appendix of pct paper, hosted at: www.jtlu.org which states that:

Usage

```
uptake_pct_govtarget(
  distance,
  gradient,
  alpha = -3.959,
  d1 = -0.5963,
  d2 = 1.866,
  d3 = 0.00805,
  h1 = -0.271,
  i1 = 0.009394,
  i2 = -0.05135
)
```

Arguments

distance	Vector distance numeric values of routes.
gradient	Vector gradient numeric values of routes.
alpha	The intercept
d1	Distance term 1
d2	Distance term 2
d3	Distance term 3
h1	Hilliness term 1
i1	document!
i2	document!

Details

```
logit (pcycle) = -3.959 +   # alpha
  (-0.5963 * distance) +    # d1
  (1.866 * distancesqrt) +  # d2
  (0.008050 * distancesq) + # d3
  (-0.2710 * gradient) +    # h1
  (0.009394 * distance * gradient) +  # i1
  (-0.05135 * distancesqrt *gradient) # i2

pcycle = exp ([logit (pcycle)]) / (1 + (exp([logit(pcycle)])
```

Examples

```
l = routes_fast_leeds
pcycle_scenario = uptake_pct_govtarget(l$length, l$av_incline)
plot(l$length, pcycle_scenario)
```

---

wight_lines_30	*Desire lines from the PCT for the Isle of Wight*

Description

This data was obtained using code shown in the introductory [pct package vignette.](#)

Examples

```
names(wight_lines_30)
plot(wight_lines_30)
```

---

wight_od	*Official origin-destination data for the Isle of Wight*

Description

This data was obtained using code shown in the introductory [pct package vignette.](#)

Examples

```
names(wight_od)
head(wight_od)
```

---

wight_routes_30	*Cycle route data for the Isle of Wight*

Description

This data was obtained using code shown in the introductory [pct package vignette.](#)

Examples

```
names(wight_routes_30)
head(wight_routes_30)
plot(wight_routes_30)
```

---

wight_zones   *Zones and centroid data from the PCT for the Isle of Wight*

Description

This data was obtained using code shown in the introductory pct package vignette.

Examples

```
names(wight_lines_30)
plot(wight_lines_30)
```

---

zones_leeds   *Zone data for Leeds*

Description

Zones in Leeds

Examples

```
# see data-raw folder for generation code
zones_leeds
```

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