Warsaw University of Technology

Faculty of Mathematics and Information Science

Spatial Data in R

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```
map <- openmap(upperLeft = c(lat= 54.8, lon= 18.2), lowerRight
= c(lat= 53.9, lon= 19.8), type="osm")
```

```
plot(map)
```

Data structure in OpenStreetMap:

- nodes
- ways
- relations

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```r
library("osmar")
pl <- get_osm(relation(49715), osmsource_api())
```

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## [1] "osmar" "list"
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names(pl)

## [1] "nodes"      "ways"       "relations"
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```

```
unclass(pl$nodes)

## $attrs
## [1] id        visible    timestamp version    changeset user
## [8] lat       lon
## <0 rows> (or 0-length row.names)
##
## $tags
## [1] id k   v
## <0 rows> (or 0-length row.names)
```

```
unclass(pl$ways)

## $attrs
## [1] id        visible   timestamp version   changeset user
## <0 rows> (or 0-length row.names)
##
## $tags
## [1] id k   v
## <0 rows> (or 0-length row.names)
##
## $refs
## [1] id   ref
## <0 rows> (or 0-length row.names)
```

```
names(pl$relations)

## [1] "attrs" "tags"  "refs"
```

```
unclass(pl$ways)

## $attrs
## [1] id        visible   timestamp version   changeset user
## <0 rows> (or 0-length row.names)
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```
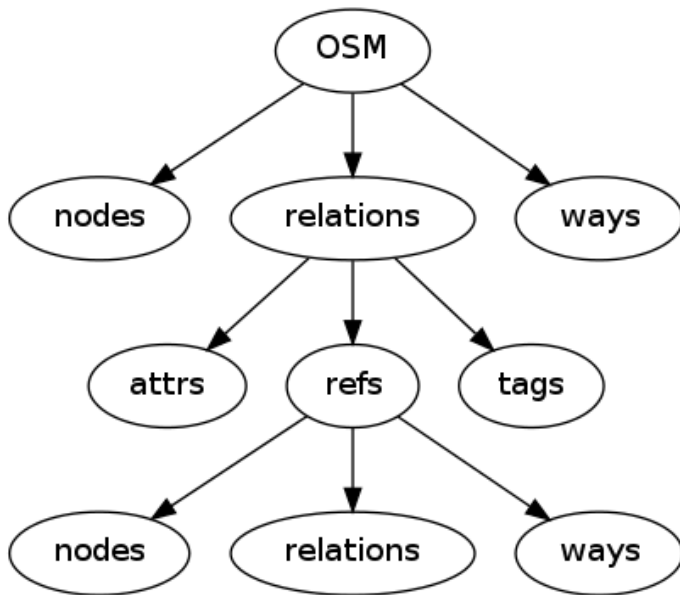
```
names(pl$relations)

## [1] "attrs" "tags"  "refs"
```

```
pl$relations$refs[c(1:3, 745:754),]

##         id     type        ref          role
## 1    49715      way 148670385         outer
## 2    49715      way  51639986         outer
## 3    49715      way 224697877         outer
## 745  49715      way  51639997         outer
## 746  49715      way 148831864         outer
## 747  49715      way  51640019         outer
## 748  49715      way 148669779         outer
## 749  49715     node 428339515  admin_centre
## 750  49715 relation    936128     land_area
## 751  49715 relation    224457       subarea
## 752  49715 relation    223407       subarea
## 753  49715 relation    130969       subarea
## 754  49715 relation    224458       subarea
```
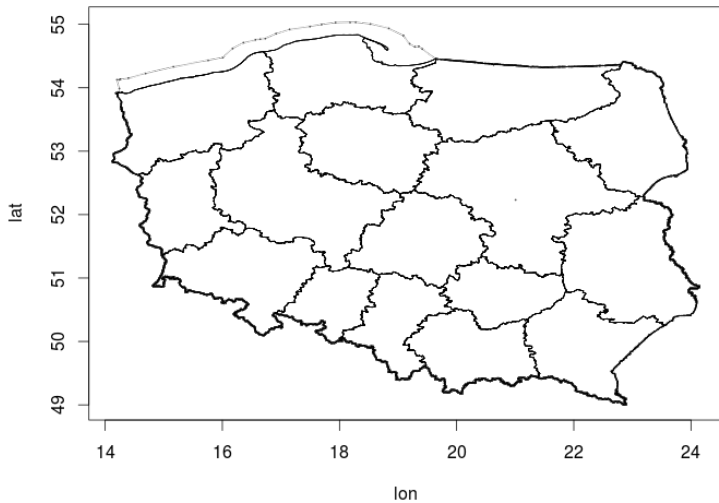
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pl <- get_osm(relation(49715), osmsource_api(), full=T)
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```r
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plot(pl)


subareas <- pl$relations$refs$ref[
                    pl$relations$refs$role=="subarea"]


for (i in subareas) {
    tmp <- get_osm(relation(i), osmsource_api(), full=TRUE)
    tmpsp <- as_sp(tmp, what="lines")
    lines(tmpsp)
}
```

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```
warsaw <- get_osm(relation(336074), osmsource_api(), full=T)
plot(warsaw)
l_184 <- get_osm(relation(3073087), osmsource_api(), full=T)
l_sp <- as_sp(l_184, what="lines")
lines(l_sp, col="red")
```