cartpgraph.R

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```
library("maptools")
```

```
## Warning: package 'maptools' was built under R version 4.2.2
```

```
## Loading required package: sp
```

```
## Warning: package 'sp' was built under R version 4.2.2
```

```
## Checking rgeos availability: FALSE
## Please note that 'maptools' will be retired during 2023,
## plan transition at your earliest convenience;
## some functionality will be moved to 'sp'.
##      Note: when rgeos is not available, polygon geometry     computations in maptools depend on gpcli
##      which has a restricted licence. It is disabled by default;
##      to enable gpclib, type gpclibPermit()
```

```
library(sp)
library(shapefiles)
```

```
## Loading required package: foreign
```

```
##
## Attaching package: 'shapefiles'
```

```
## The following objects are masked from 'package:foreign':
##
##     read.dbf, write.dbf
```

```
fdc <- readShapePoly("Tunisie_snuts4")
```

```
## Warning: shapelib support is provided by GDAL through the sf and terra packages
## among others
```

```
donnees <- read.csv("tunisie_data_del_2011_2.csv", header = TRUE, sep = ";",dec = ",", encoding = "latin
dim(donnees)
```

```
## [1] 263  17
```

```
pt <- cbind(fdc@data[, "id"], as.data.frame(coordinates(fdc)))
colnames(pt) <- c("id", "x", "y")
i=match(pt[, "id"], donnees[, "del"])
pt <- data.frame(pt, donnees[i, ])
pt$var <- pt$IDRVA2011
x1 <- bbox(fdc)[1]
y1 <- bbox(fdc)[2]
x2 <- bbox(fdc)[3]
y2 <- bbox(fdc)[4]
sfdc <- (x2 - x1) * (y2 - y1)
sc <- sum(pt$var, na.rm = TRUE)
k <- 0.2
pt$size <- sqrt((pt$var*k*sfdc/sc)/pi)
plot(fdc, border = "white", col = "grey")
symbols(pt[, c("x","y")], circles = pt$size, add = TRUE, bg = "red", inches = FALSE)

LegTitle <- "Nombre \nd'habitants\n"
rLeg <- quantile(pt$size, c(1, 0.9, 0.25, 0), type = 1, na.rm = TRUE);rLeg
```

```
##     100%      90%      25%       0%
## 15073.28 10764.48  6535.62     0.00
```

```
rVal <- quantile(pt$var, c(1, 0.9, 0.25, 0), type = 1, na.rm = TRUE);rVal
```

```
##  100%   90%   25%    0%
## 1.000 0.510 0.188 0.000
```

```
l <- data.frame(x = x1, y = y1);head(l)
```

```
##         x        y
## 1 4089658 807127.5
```

```
xinit <- l$x + rLeg[1];xinit
```

```
##    100%
## 4104731
```

```
ypos <- l$y + rLeg;ypos
```

```
##     100%      90%      25%       0%
## 822200.8 817892.0 813663.1 807127.5
```

```
symbols(x = rep(xinit, 4), y = ypos, circles = rLeg, add = TRUE, bg = "red", inches = FALSE)
text(x = rep(xinit, 4) + rLeg[1] * 1.2, y = (l$y + (2 * rLeg)), rVal, cex = 0.3, srt = 0, adj = 0)
for (i in 1:4) {segments(xinit, (l$y + (2 * rLeg[i])), xinit + rLeg[1] * 1.1, (l$y + (2 * rLeg[i])))
}
text(x = xinit - rLeg[1], y = (l$y + (2 * rLeg[1])), LegTitle, adj = c(0, 0),cex = 0.7)
title(main = "Population, 2010",  cex.sub = 0.7)
xscale <- x2
```

```
yscale <- y1
sizescale <- 50000
labelscale <- "50km"
SpatialPolygonsRescale(layout.scale.bar(), offset = c(xscale, yscale), scale = sizescale,  fill = c("bla
text(xscale + sizescale/2, yscale, paste(labelscale, "\n\n", sep = ""), cex = 0.7)
xarrow <- x1
yarrow <- y2 - (y2 - y1)/10
SpatialPolygonsRescale(layout.north.arrow(2), offset = c(xarrow, yarrow), scale = 50000, plot.grid = F)
```

Population, 2010