Begin with the following definitions:

* : count of people of type x in area i
* : count of people of type y in area i, where y is mutually exclusive with x
* : total population of area i
* : total number of areas
* : total count of x in all areas
* : total count of y in all areas

Further, define:

and

where indicates that areas indexed j be sorted according to an additional area level attribute. In the case of RCI this sorting is by distance in ascending order; in the case of RDI this sorting is by density in descending order.

Given the above both RCI and RDI can be defined as

R code below:

RCI <- function(povvec, popvec, order)

{

#Storage vectors for X = ordered vector of people "in poverty"; Y = "not in pov"

X <- 1:length(povvec)

Y <- X

#povvec[i] is the number of people in poverty (on JSA, Income Support or whatever) in area i

#X[i] is total number of people in poverty in the i units closest to city centre,

#divided by overall number of people in poverty.

for(i in 1:length(X))

{

X[i] <- sum(povvec[order[1:i]])/sum(povvec)

Y[i] <- sum(popvec[order[1:i]] - povvec[order[1:i]])/sum(popvec - povvec)

}

#Variable to hold result

res.rce = 0

for(i in 2:length(X))

{

res.rce <- res.rce + X[i-1] \* Y[i] - X[i] \* Y[i-1]

}

return(res.rce)

}