

SAMPLING, WEIGHTING AND ESTIMATION

EXERCISE 2

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- 1 Load the `survey` package and the `api` datasets in it.
- 2 The dataset `apistrat` is a sample of schools from `apipop` stratified by `stype`. Assuming the selection within the strata was done by SRS, define a `svydesign` object that enables you to make unbiased point and variance estimates. Estimate the mean of `api00`.
- 3 Now you should try different allocations. Using `stype` again as a stratification variable calculate the allocation of a sample of 60 schools from `apipop`, using equal, proportional to the number of schools, and optimal with regard to `api99` allocation.
- 4 Select a StrSRS from `apipop` for each of your allocations.
- 5 Estimate again the mean of `api00` from your three different samples.

```
##### Input #####  
#strind: the stratification variable; a population length vector.  
#nh:      allocation; a vector with elements named after the strata.  
#replace: logical; sampling with or without replacement.  
##### Output #####  
#A numeric vector containing the sampled  
#rows of the population dataset.
```

```
strSR.sample <- function(strind, nh, replace=FALSE){  
  Nh <- table(strind)[names(nh)]  
  h.id <- split(1:sum(Nh), strind)[names(nh)]  
  sam <- mapply( function(x,y) sample(x, y, replace=replace)  
                , Nh, nh, SIMPLIFY = F)  
  unlist(mapply(function(x,y) x[y]  
                , h.id  
                , sam, SIMPLIFY = F)  
        ,use.names = FALSE)  
}
```