a

```
sharks <- read.csv('sharks.csv',header=T)
pop <- list(pop1 = subset(sharks, sharks$Australia == 1), pop2 = subset(sharks,
    sharks$USA == 1))
mixRandomly <- function(pop) {
    pop1 <- pop$pop1
    n_pop1 <- nrow(pop1)

    pop2 <- pop$pop2
    n_pop2 <- nrow(pop2)

    mix <- rbind(pop1, pop2)
    select4pop1 <- sample(1:(n_pop1 + n_pop2), n_pop1, replace = FALSE)

    new_pop1 <- mix[select4pop1, ]
    new_pop2 <- mix[-select4pop1, ]
    list(pop1 = new_pop1, pop2 = new_pop2)
}
getAveDiffsFn <- function(variate) {
    function(pop) {
        mean(pop$pop1[, variate]) - mean(pop$pop2[, variate])
    }
}

getSDRatioFn <- function(variate) {
    function(pop) {
        sd(pop$pop1[, variate])/sd(pop$pop2[, variate])
    }
}
diffAveLengths <- getAveDiffsFn("Length")
ratioSDLengths <- getSDRatioFn("Length")
set.seed(341)
mixedPop <- mixRandomly(pop)

diffLengths <- sapply(1:5000, FUN = function(...) {
    diffAveLengths(mixRandomly(pop))
})
round(c(diffAveLengths(mixedPop), ratioSDLengths(mixedPop)), 3)
```

```
## [1] 8.528 0.969
```