Why BLB is fast

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```
n <- 100000
b <- 100
N <- rnorm(n)
B <- sample(N,b)

mean0 <- function(N,n){
  X <- sample(N, n, replace = TRUE)
  return(mean(X))
}

mean1 <- function(B,n){
X <- sample(B, n, replace = TRUE)
return(mean(X))
}

mean2 <- function(B,n,b){
  X <- as.numeric( rmultinom(1,n,rep(1/b,b)) )
  return(sum(X*B)/n)
}

mean0(N,n)
```

```
## [1] 0.0001172181
```

```
mean1(B,n)
```

```
## [1] 0.1169493
```

```
mean2(B,n,b)
```

```
## [1] 0.1211508
```

```
microbenchmark::microbenchmark(mean0(N,n),mean1(B,n), mean2(B,n,b))
```

```
## Unit: microseconds
##            expr      min       lq       mean    median        uq       max
##     mean0(N, n) 1955.048 2096.614 3192.13140 2447.9895 2911.3800 40233.297
##     mean1(B, n) 1848.265 1870.685 2787.35440 2020.5600 2565.5080 34120.396
##  mean2(B, n, b)   16.077   20.072   33.19767   34.9485   42.2525    55.461
##  neval
##    100
##    100
##    100
```