

```

trees
#help(trees)
trees$Volume
N <- 31
y <- trees$Volume
#hist(y, freq = F, xlim=c(10,80) )
mean(y)
sd(y)

#
p <- trees$Girth
p
sum(p)
p <- p/sum(p)
p
sum(p)

#
n <- 10

#
ybar <- numeric(0)
b <- 10000
for (k in 1:b)
{s <- sample(1:N,n,repl=T,prob=p); ybar[k] <- mean(y[s])}
mean(ybar)
sd(ybar)
hist(ybar, freq= F, xlim=c(10,80), ylim=c(0,0.15))

#
ybarSRS <- numeric(0)
for (k in 1:b)
{s <- sample(1:N,n,repl=T); ybarSRS[k] <- mean(y[s])}
mean(ybarSRS)
sd(ybarSRS)
hist(ybarSRS, freq = F, xlim=c(10,80), ylim=c(0,0.15), add = T, col = "yellow")

#
hh <- numeric(0)
hh <- mean(y[s]/p[s])/N
for (k in 1:b)
{s <- sample(1:N,n,repl=T,prob=p); hh[k] <- mean(y[s]/p[s])/N}
mean(hh)
sd(hh)

```

```
hist(hh, freq = F, xlim=c(10,80), ylim=c(0,0.15), add = T, col = "blue")
```

```
#
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```
pii <- 1-(1-p)^n
```

```
pii
```

```
ht <- numeric(0)
```

```
for (k in 1:b)
```

```
{s <- sample(1:N,n,repl=T,prob=p); su <- unique(s);
```

```
ht[k] <- sum(y[su]/pii[su])/N}
```

```
mean(ht)
```

```
sd(ht)
```

```
hist(ht, freq = F, xlim=c(10,80), ylim=c(0,0.15), add = T, col = "red")
```