Jackknife for $\bar{X}$

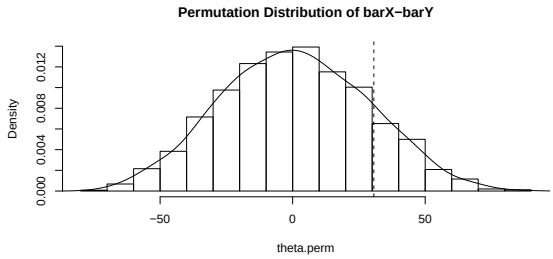
```
> x
 [1] 53 46 44 58 64 45 40 53 73 40 73 47 63 52 82
> theta.minusi <- numeric(0)
> n <- length(x)
> for (i in 1:n) {
+   theta.minusi[i] <- mean(x[-i])
+ }
> theta.minus <- mean(theta.minusi)
> theta <- mean(x)
> (n-1)*(theta.minus-theta)
[1] 0
> sqrt((n-1)/n*sum((theta.minusi-theta.minus)^2))
[1] 3.352137
> sd(x)/sqrt(n)
[1] 3.352137
>
```

Jackknife for $\bar{X}_\alpha$

```
> attach(cereal)
> theta.minusi <- numeric(0)
> n <- length(rating)
> for (i in 1:n) {
+   theta.minusi[i] <- mean(rating[-i],trim=.1)
+ }
> theta.minus <- mean(theta.minusi)  # *NOT* trimmed
> theta <- mean(rating,trim=.1)
> (n-1)*(theta.minus-theta)
[1] -0.5778958
> sqrt((n-1)/n*sum((theta.minusi-theta.minus)^2))
[1] 1.529543  # compared to SE_boot = 1.529365
>
```

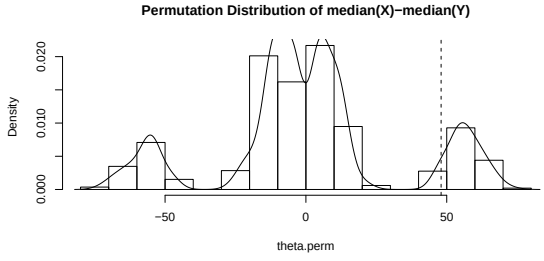

Permutation Test of Mice Means

```
> trt <- c(16,23,38,94,99,141,197)
> cntrl <- c(10,27,31,40,46,50,52,104,146)
> surv <- c(trt,cntrl)
> theta.perm <- numeric(2500)
> for (i in 1:2500) {
+   perm <- sample(surv)
+   trt.perm <- perm[1:7]
+   cntrl.perm <- perm[8:16]
+   theta.perm[i] <- mean(trt.perm)-mean(cntrl.perm)
+ }
> hist(theta.perm, main="Permutation Distribution of barX-barY", freq=F)
> lines(density(theta.perm, bw="sj"))
> (theta.observed <- mean(trt)-mean(cntrl))
[1] 30.63492
> abline(v=theta.observed, lty=2)
> sum(abs(theta.perm) > abs(theta.observed)
[1] 699
> sum(abs(theta.perm) > abs(theta.observed))/2500
[1] 0.2796
>
```



Permutation Test of Mice Medians

```
> theta.perm <- numeric(2500)
> for (i in 1:2500) {
+   perm <- sample(surv)
+   trt.perm <- perm[1:7]
+   cntrl.perm <- perm[8:16]
+   theta.perm[i] <- median(trt.perm)-median(cntrl.perm)
+ }
> hist(theta.perm, main="Permutation Distribution of median(X)-median(Y)",
       freq=F)
> lines(density(theta.perm))
> (theta.observed <- median(trt)-median(cntrl))
[1] 48
> sum(abs(theta.perm) > abs(theta.observed))
[1] 620
> sum(abs(theta.perm) > abs(theta.observed))/2500
[1] 0.248
>
```



Permutation Test of Paired Shoes

```
> theta.observed <- mean(A-B)
> theta.perm <- numeric(2500)
> for (i in 1:2500) {
+   flip <- (rbinom(10,1,.5)==1)
+   A.perm <- A
+   B.perm <- B
+   temp <- A.perm[flip]
+   A.perm[flip] <- B.perm[flip]
+   B.perm[flip] <- temp
+   theta.perm[i] <- mean(A.perm-B.perm)
+ }
> hist(theta.perm, main="Permutation Distribution of mean(A-B)", freq=F)
> lines(density(theta.perm))
> abline(v=theta.observed, lty=2)
> sum(abs(theta.perm)>abs(theta.observed))
[1] 20
> sum(abs(theta.perm)>abs(theta.observed))/2500
[1] 0.008
>
```