

STAT 217: In Class 8/28

```
set.seed(21)
mt <- rnorm(20, 105, 20)
id <- rnorm(20, 100, 20)

iq <- data.frame(c(mt, id), c(rep("mt", 20), rep("id", 20)))
names(iq) <- c("iq", "state")
```

iq

##		iq	state
##	1	120.9	mt
##	2	115.4	mt
##	3	139.9	mt
##	4	79.6	mt
##	5	148.9	mt
##	6	113.7	mt
##	7	73.6	mt
##	8	86.3	mt
##	9	106.3	mt
##	10	105.0	mt
##	11	59.5	mt
##	12	120.1	mt
##	13	94.0	mt
##	14	108.5	mt
##	15	116.3	mt
##	16	135.2	mt
##	17	118.2	mt
##	18	127.4	mt
##	19	89.3	mt
##	20	96.5	mt
##	21	107.9	id
##	22	100.7	id
##	23	79.4	id
##	24	74.7	id
##	25	95.5	id
##	26	114.9	id
##	27	106.7	id
##	28	77.5	id
##	29	85.9	id
##	30	85.4	id
##	31	63.3	id
##	32	91.8	id
##	33	100.5	id
##	34	118.2	id
##	35	132.7	id
##	36	101.2	id
##	37	137.0	id
##	38	101.6	id
##	39	128.4	id
##	40	129.2	id

```

require(mosaic)

mean(mt)

## [1] 108

mean(id)

## [1] 102

Tobs <- diffmean(iq ~ state, data = iq) ## this is the observed diff in means
Tobs

## diffmean
##      6.1

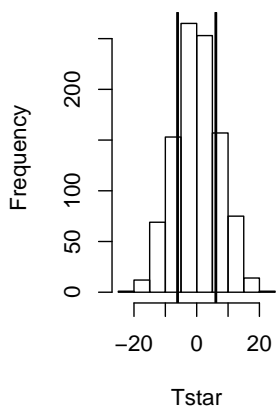
B <- 1000 ## this is how many permutations you want
Tstar <- matrix(NA, nrow = B) ## setting up empty slots to put our permutation statistics in
for (b in 1:B) {
  Tstar[b] <- diffmean(iq ~ shuffle(state), data = iq) ## the bth permutation stat
  ## the text uses compareMean, but that is an outdated function
}
Tstar[1:10,]

## [1] -5.45 11.42 -6.49 13.98 -5.46 -13.86 -12.92 -2.22 2.12
## [10] 14.41

par(mfrow = c(1, 2)) ## telling R to put the two plots side by side
hist(Tstar)
abline(v = Tobs, lwd = 2) ## adding a line for the observed statistic
abline(v = -Tobs, lwd = 2)
plot(density(Tstar), main = "Density Plot of Tstar", xlab = "")
abline(v = Tobs, lwd = 2)
abline(v = -Tobs, lwd = 2)

```

Histogram of Tstar



Density Plot of Tstar

