

HW3 - SDS 315

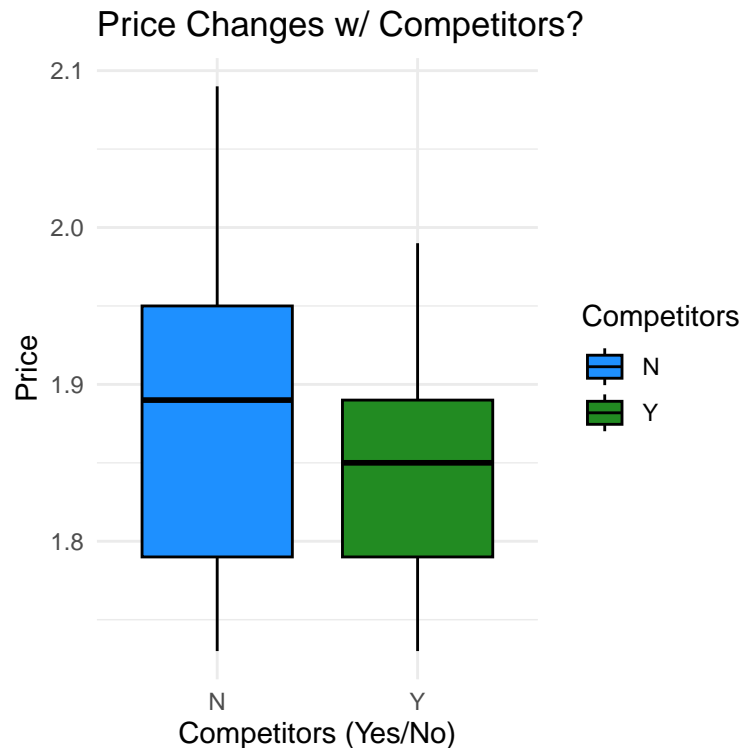
Ahantya Sharma

UT EID: as236366

Github Link: <https://github.com/Ahantya/SDS315/blob/main/HW3/HW3Markdown.Rmd>

Problem 1 - Gas Prices

A.



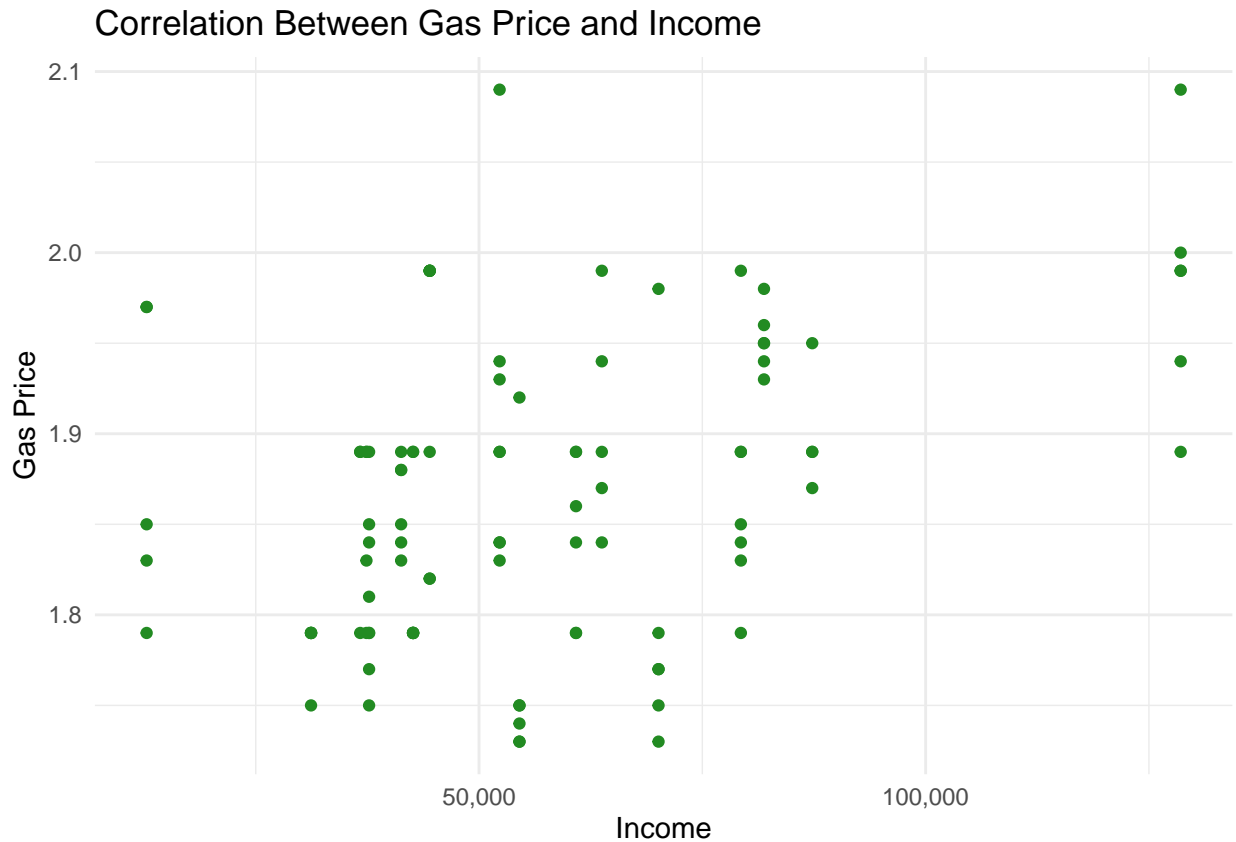
```
##      name      lower      upper level      method      estimate
## 1 diffmean -0.05491412 0.007604774 0.95 percentile -0.02348235
```

Claim: Gas stations charge more if they lack direct competition in sight.

Evidence: At a 95% confidence interval, the difference in mean prices between gas stations with competitors and gas stations without competitors is from -0.056 to 0.008. Because zero is contained within this confidence interval, there is no statistical significance (at the 5% level) to claim that gas stations charge more if they lack direct competition in sight.

Conclusion: The theory is unsupported by the evidence, as there is no data to support a statistically significant difference between prices and gas stations with / without competition in sight.

B.



```
## name lower upper level method estimate
## 1 cor -0.1937153 0.1934174 0.95 percentile 0.3961546
```

Claim: The richer the area, the higher the gas prices.

Evidence: At a 95% confidence interval, the correlation in prices between gas stations and the median household income in the surrounding of the gas station ranges from are -0.189 to 0.203. Because zero is contained within this confidence interval, there is no statistical significance (at the 5% level) to claim that gas stations charge more if they lack direct competition in sight.

Conclusion: The theory is unsupported by the evidence, as there is no data to support a statistically significant correlation between the median household income and the gas prices.

C.

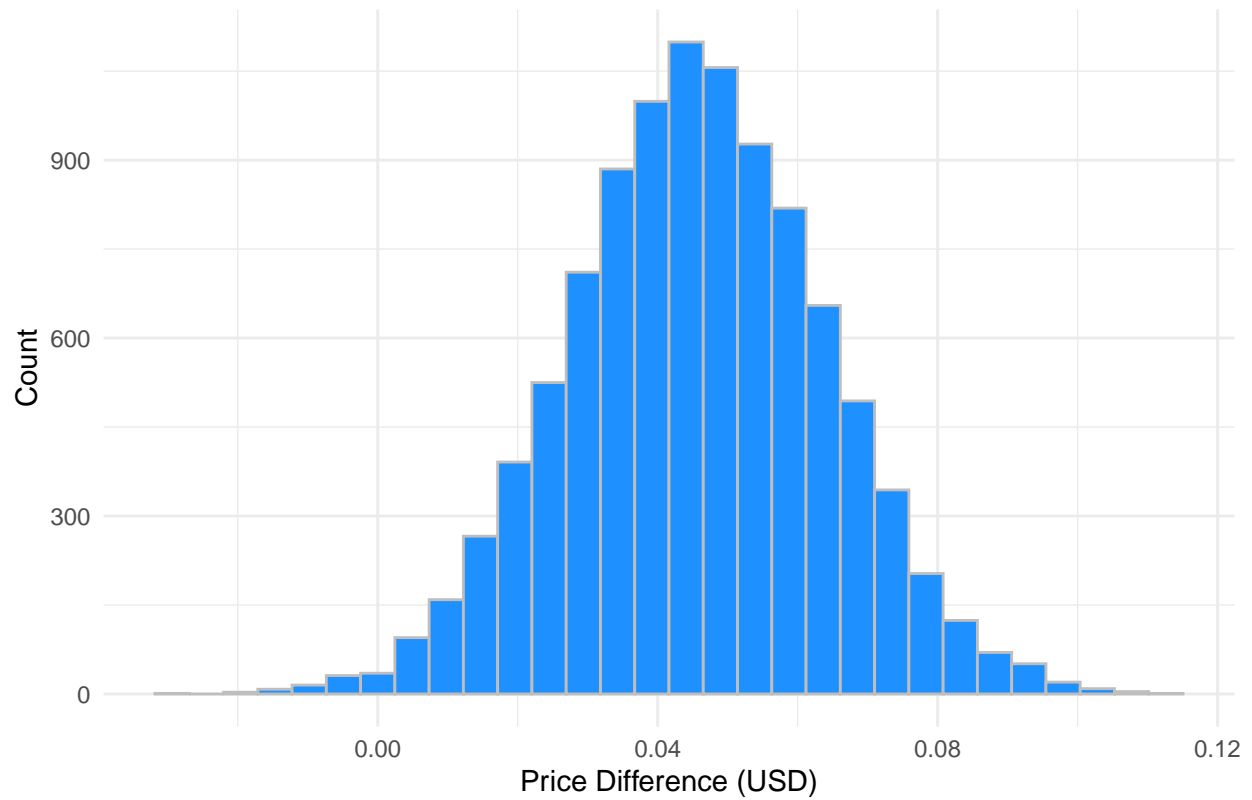
```
##      name      lower      upper level      method      estimate
## 1 diffmean -0.03946299 0.03029184 0.95 percentile -0.003299916
```

Claim: Gas stations at stoplights charge more.

Evidence: At a 95% confidence interval, -0.039 to 0.306

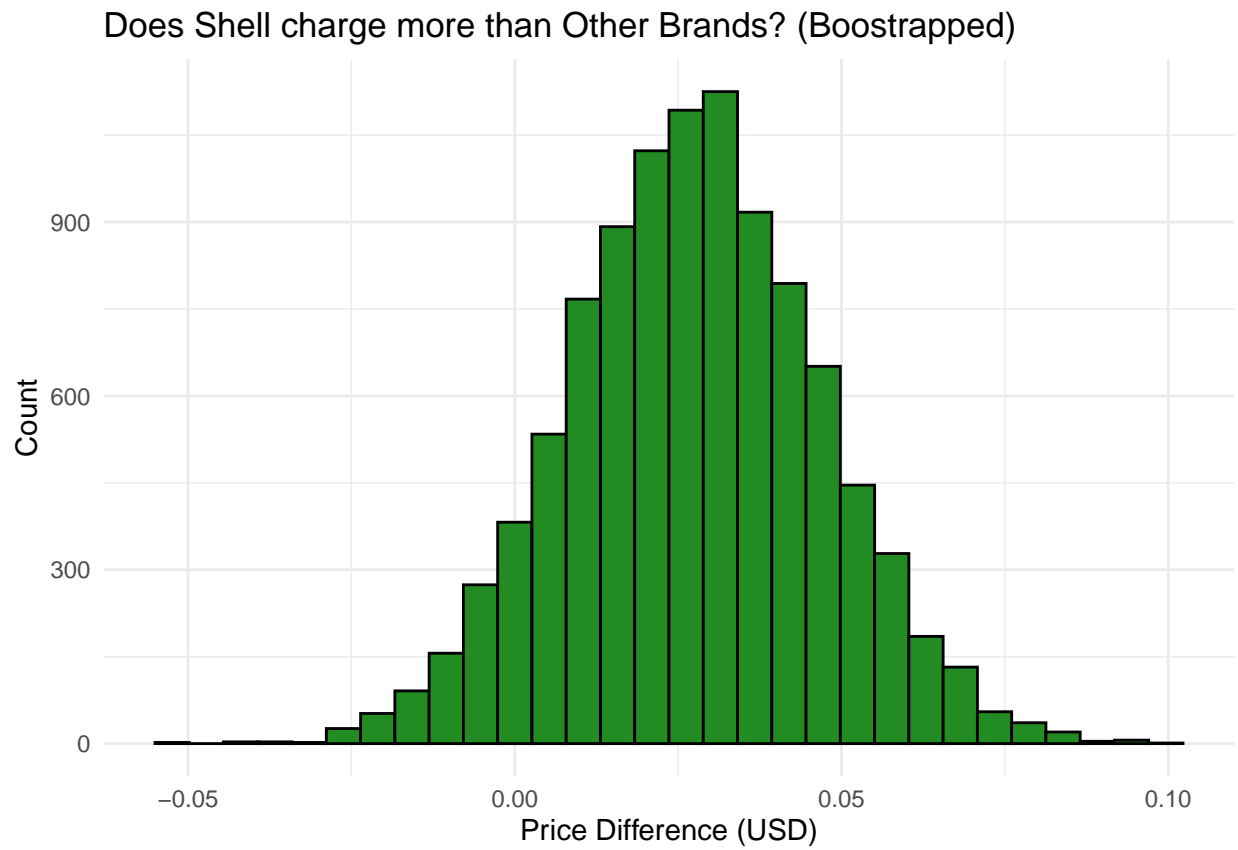
D.

Does Direct Highway Access increase Gas Prices? (Boostrapped)



Claim: Gas stations with direct highway access charge more.

E.

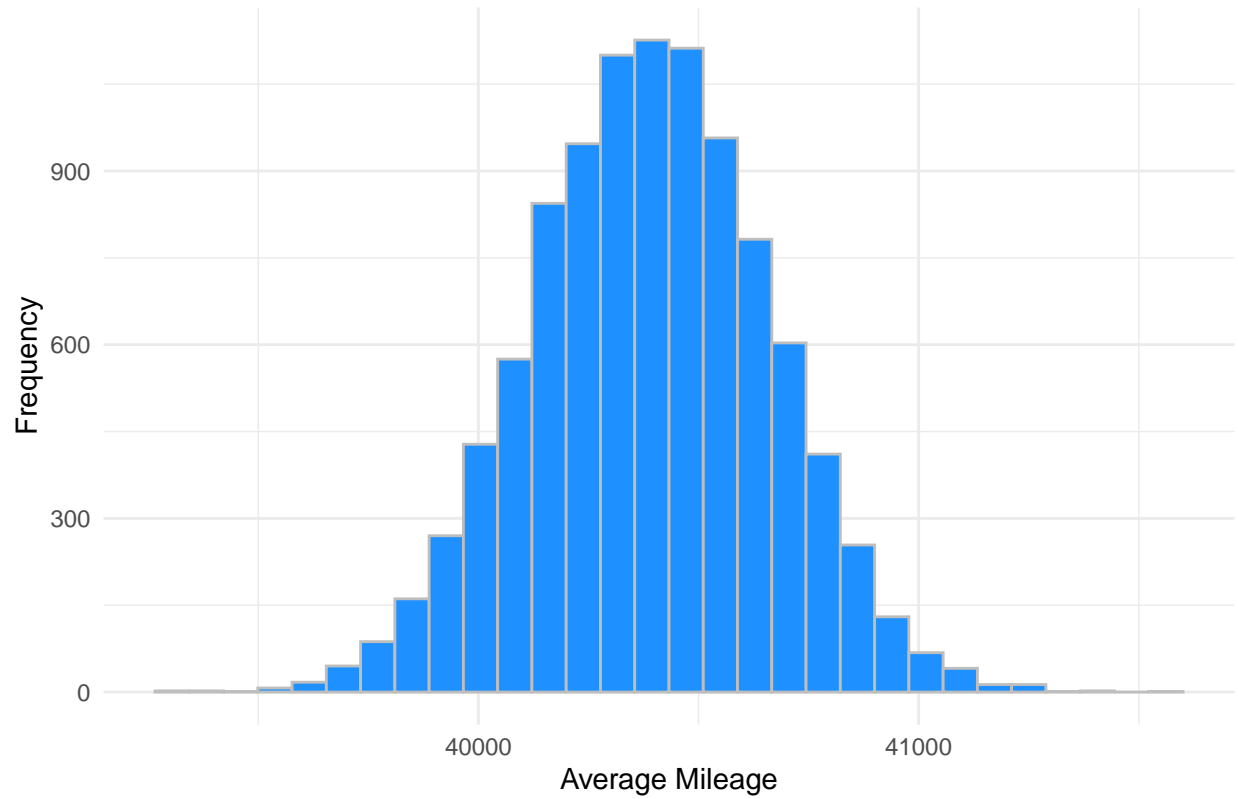


Claim: Shell charges more than all other non-Shell brands.

Problem 2 - Mercedes S-Class Vehicles

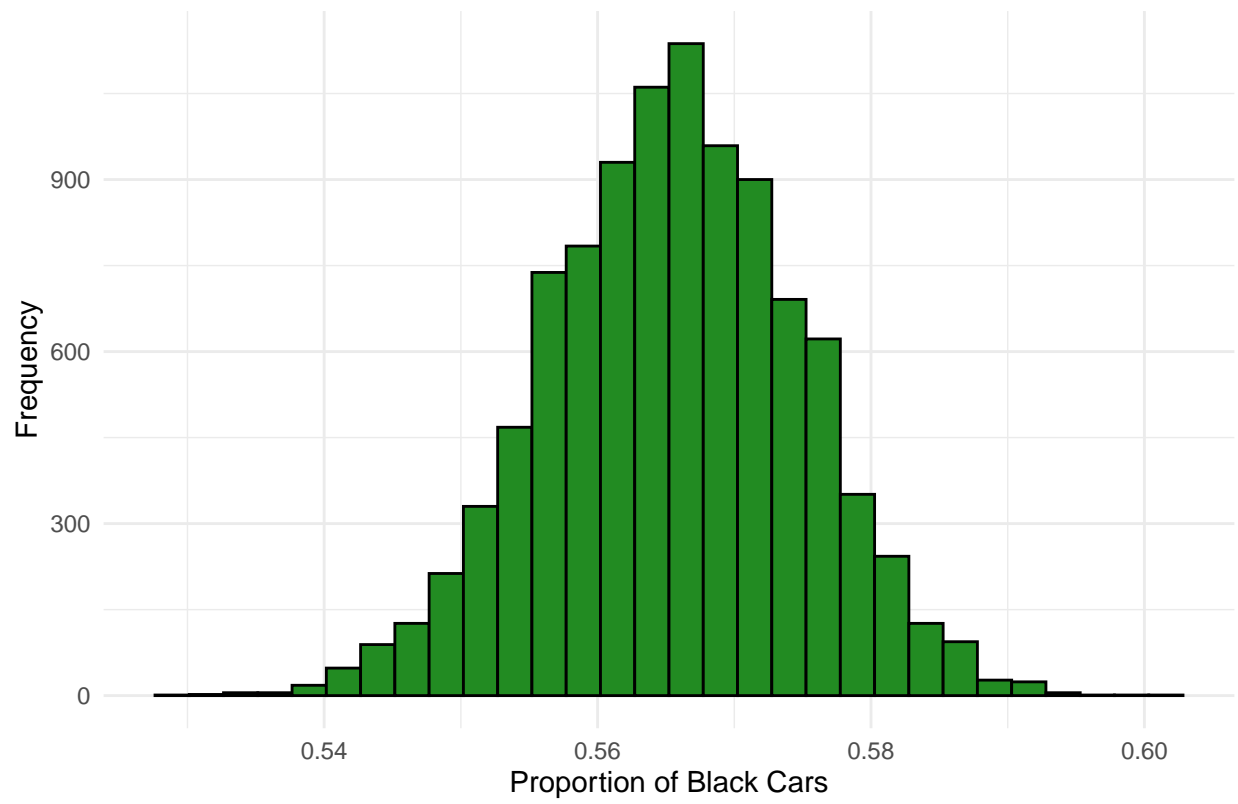
Part A - 2011 S-Class 63 AMGs

Boostrapped Average Mileage (2011 63 AMG)



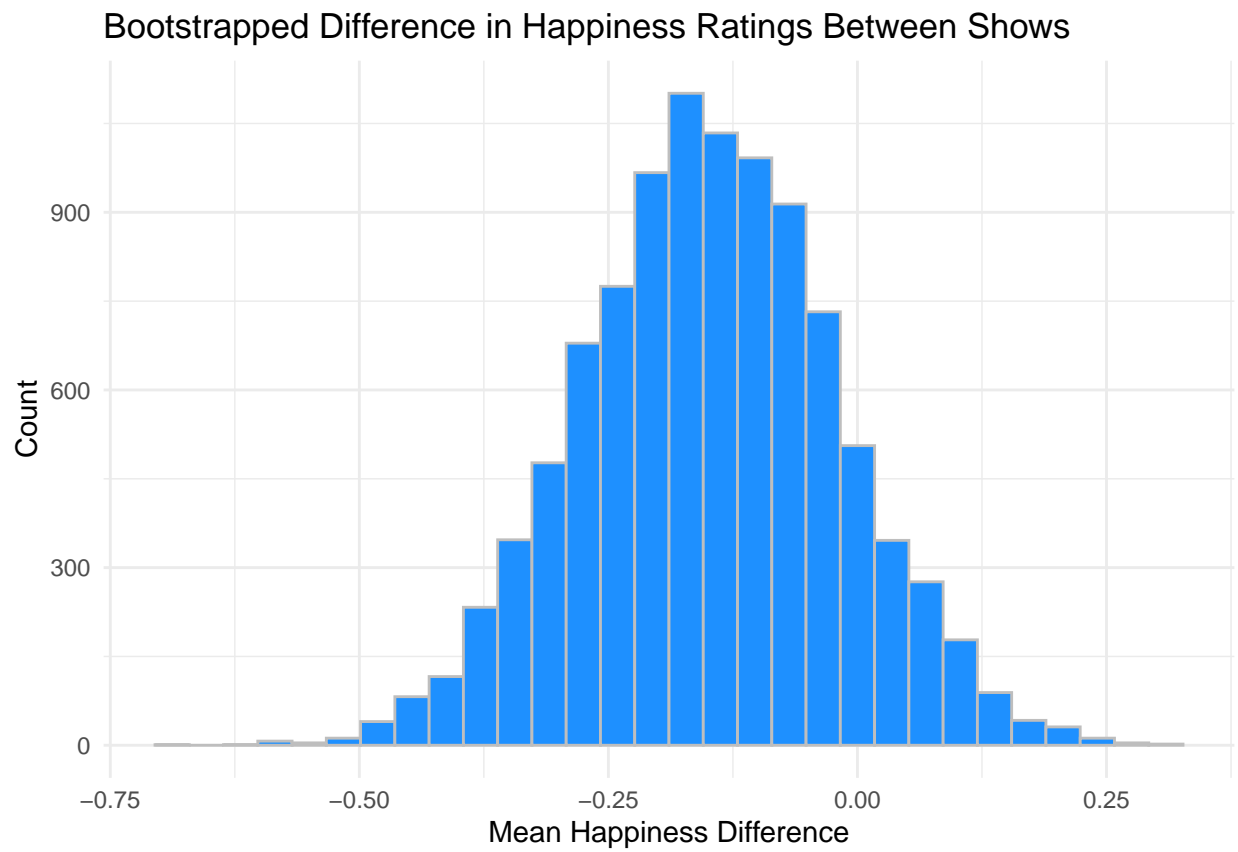
Part B - 2014 S-Class 550s

Boostrapped Proportion of Black 550s in 2014

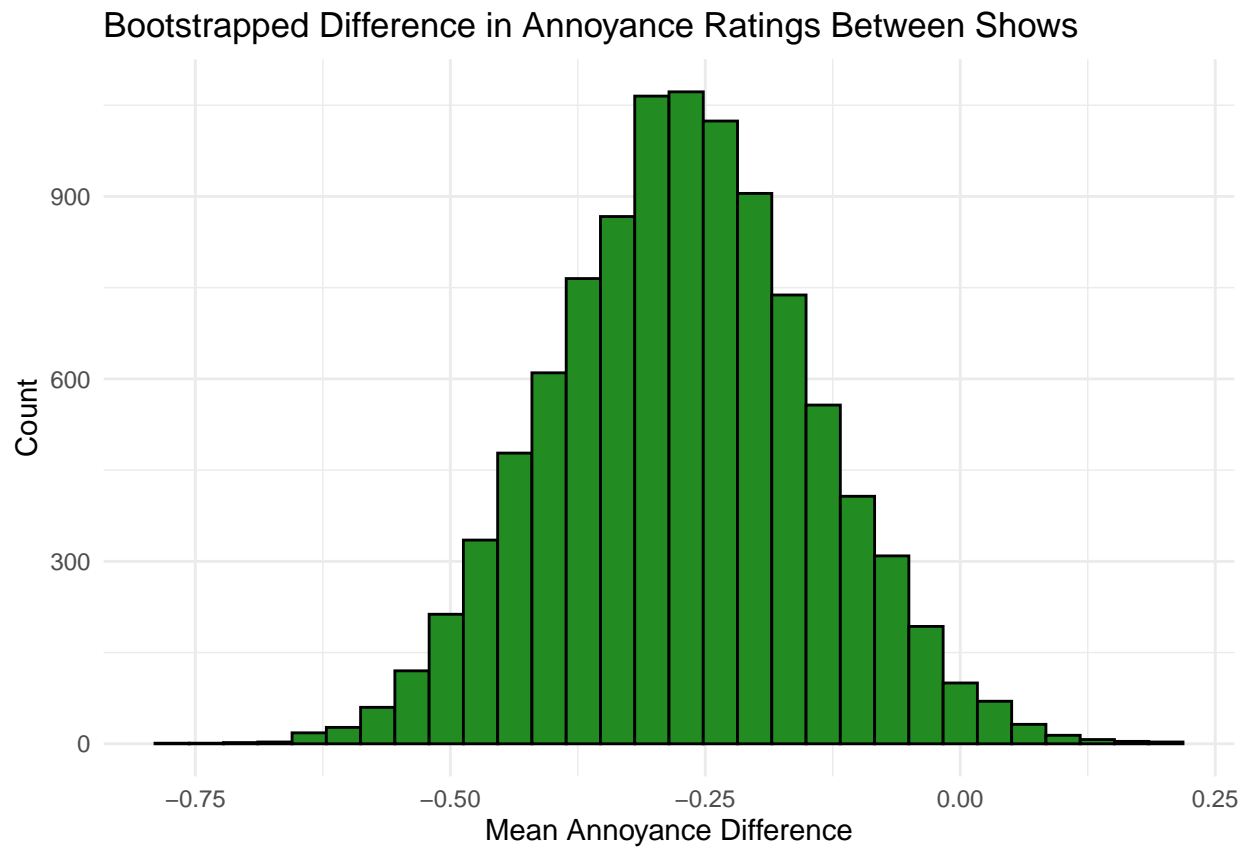


Question 3 - NBC Pilot Surveys

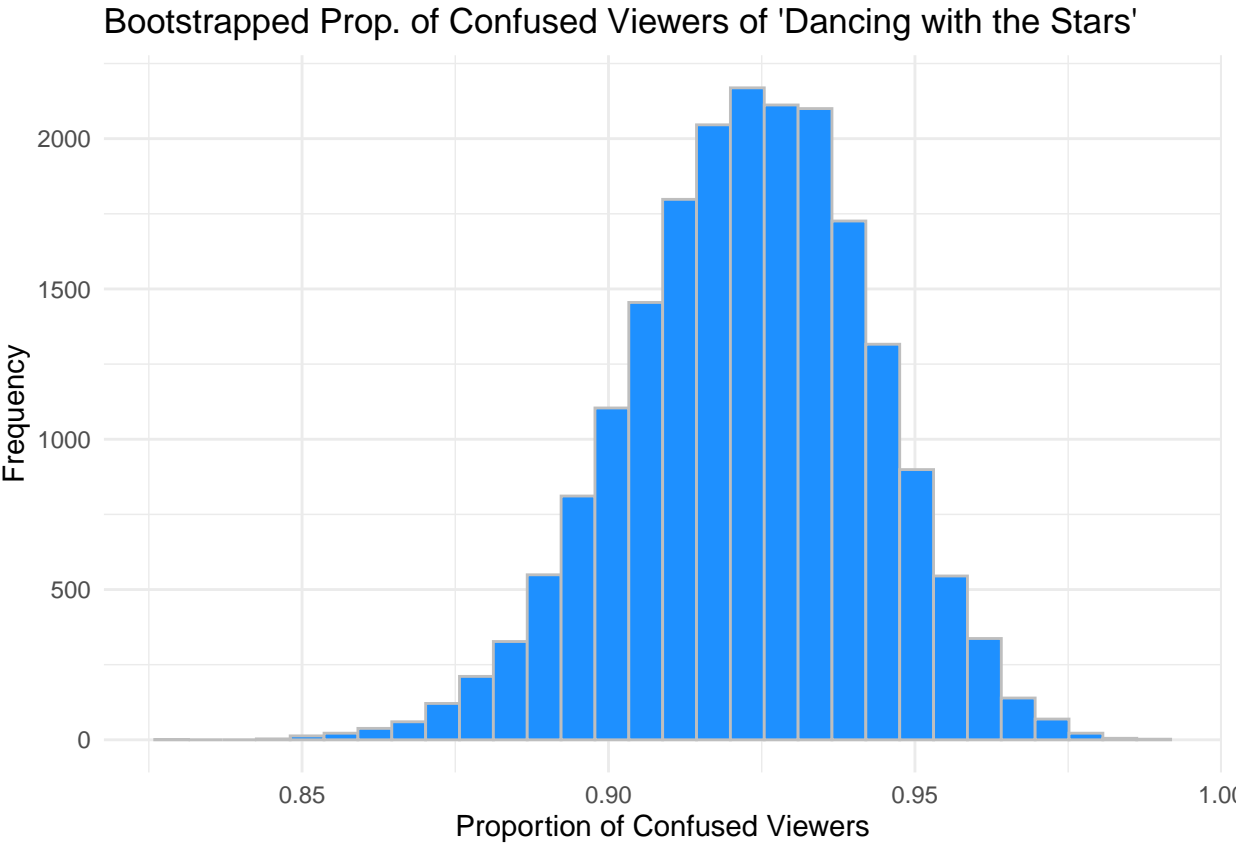
Part A - Difference of Means in Happiness



Part B - Difference of Means in Annoyingness



Part C - Proportion of Confusion in Dancing with the Stars



Problem 4 - EBay

