Assignment 4

Ozone

February 6, 2018
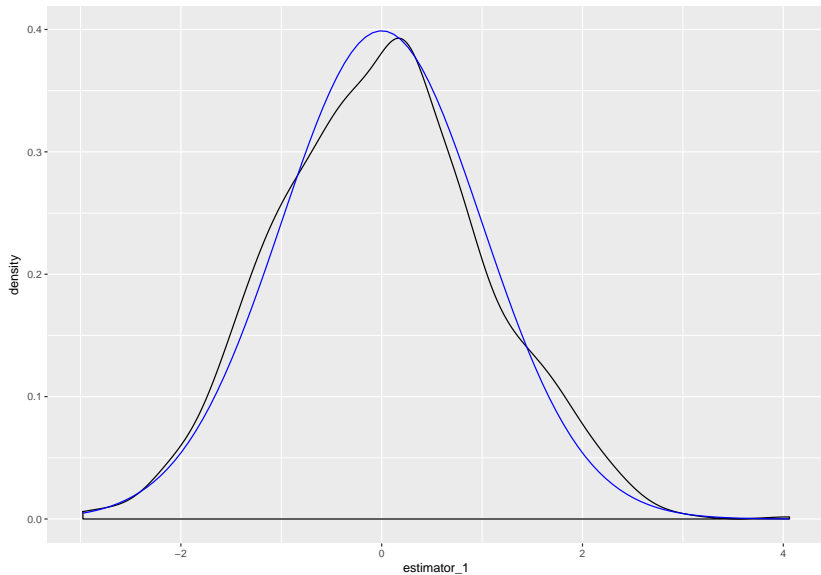
1. Explain to your students

$y = 3x + 2 + e$, where $x \sim N(1, 1)$, $e \sim \chi^2(2)$
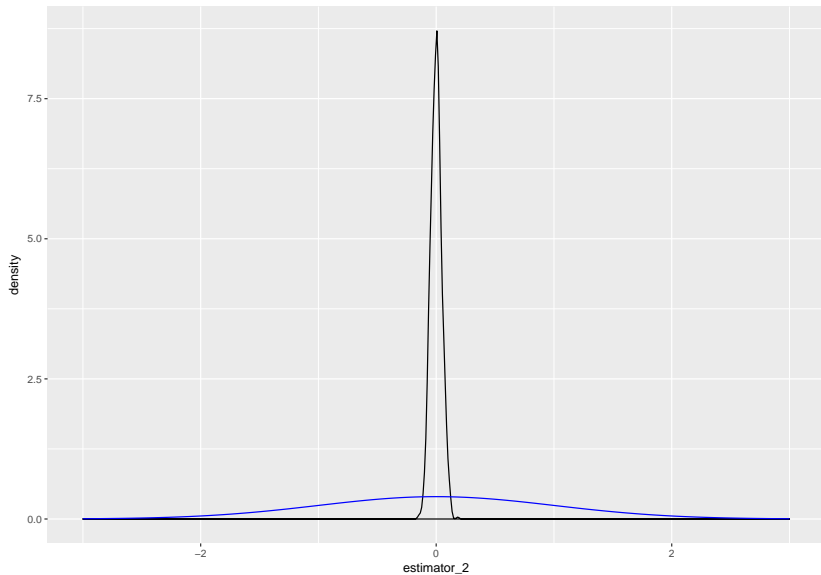
estimator_1 $= \frac{\hat{\beta} - \beta}{std.err(\hat{\beta})}$ is approximately $N(0, 1)$

estimator_2 $= \hat{\beta} - \beta$ converges to 0

OLS estimator converges to a distribution

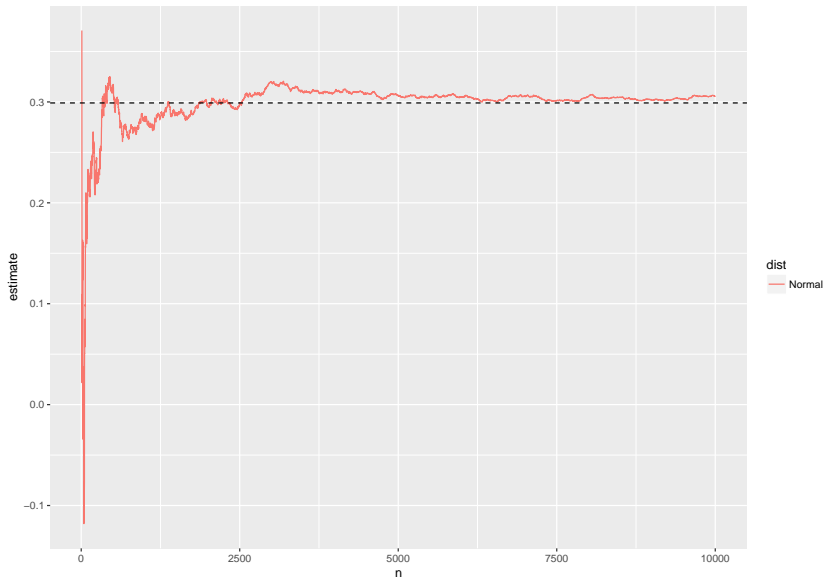# OLS estimator coverges to a constant

2. Augustin-Louis Cauchy

```
##
## \begin{table}[!htbp] \centering
##   \caption{Means and sd of the OLS coefficients}
##   \label{}
## \begin{tabular}{@{\extracolsep{5pt}} cccc}
## \\[-1.8ex]\hline
## \hline \\[-1.8ex]
##  & dist & means & sd \\
## \hline \\[-1.8ex]
## 1 & Normal & $0.299$ & $0.026$ \\
## 2 & Cauchy & $0.352$ & $0.314$ \\
## \hline \\[-1.8ex]
## \end{tabular}
## \end{table}
```

- In the Normal distribution case, With sample size n inceasing, $\hat{\beta}$ converges to the true value $\beta = 0.3$ as shown in the graph.
- The Cauchy distribution does not have finite moments of any

Normal

Cauchy