

# 006-Sensitivity Analysis of One Paramter

## Central Limit Theorem

May 27, 2015

### Abstract

Often in statistics, we are required to perform sensitivity analyses to see the effect of parameters on inference. Here I provide a simple illustration of performing such a task in an efficient and reproducible way using the function `knitr::knit_expand` (Xie, 2015, 2013, 2014). We use the demonstration of the Central Limit Theorem (CLT) in action (Joseph, 2010) as an example.

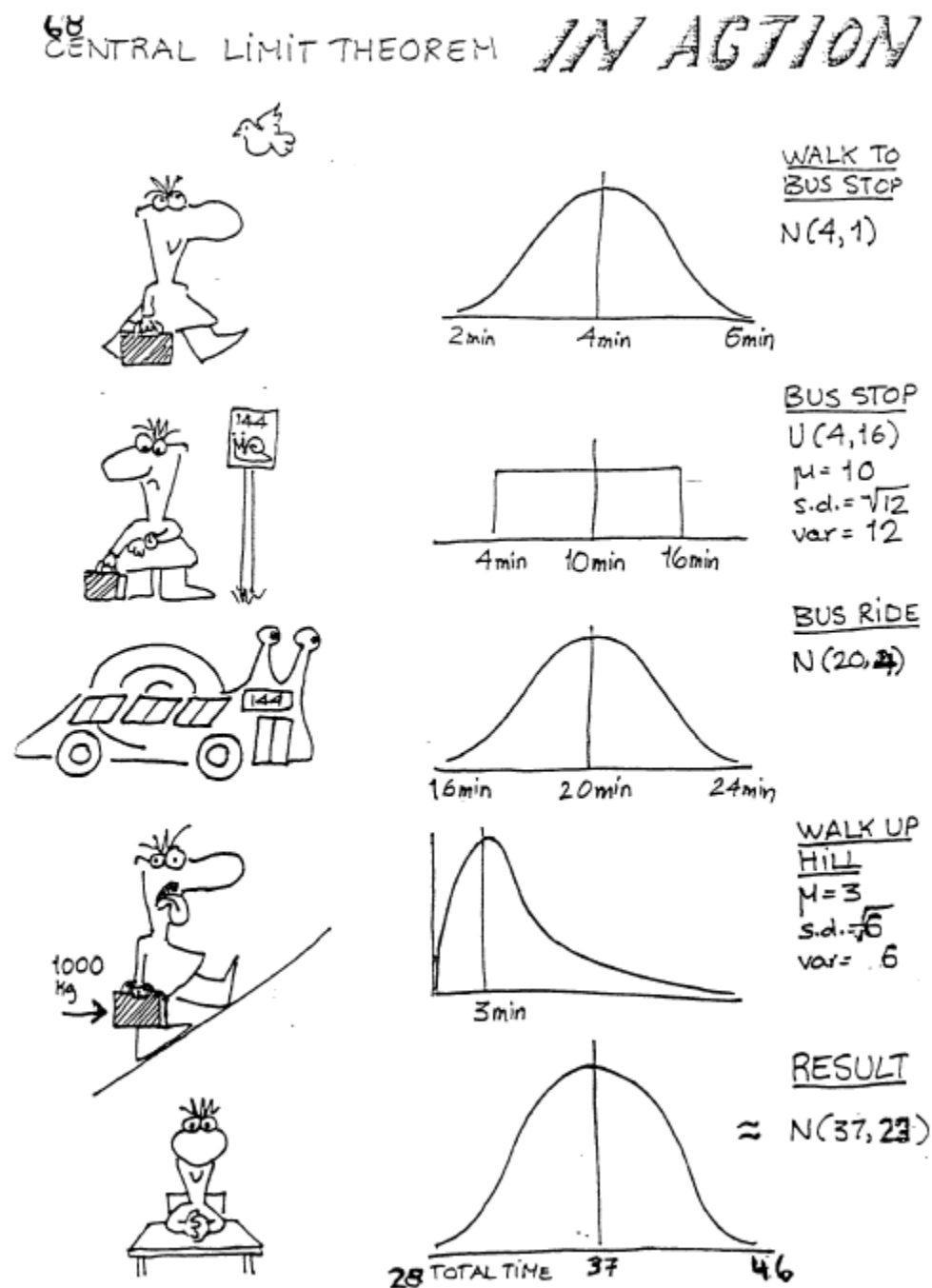
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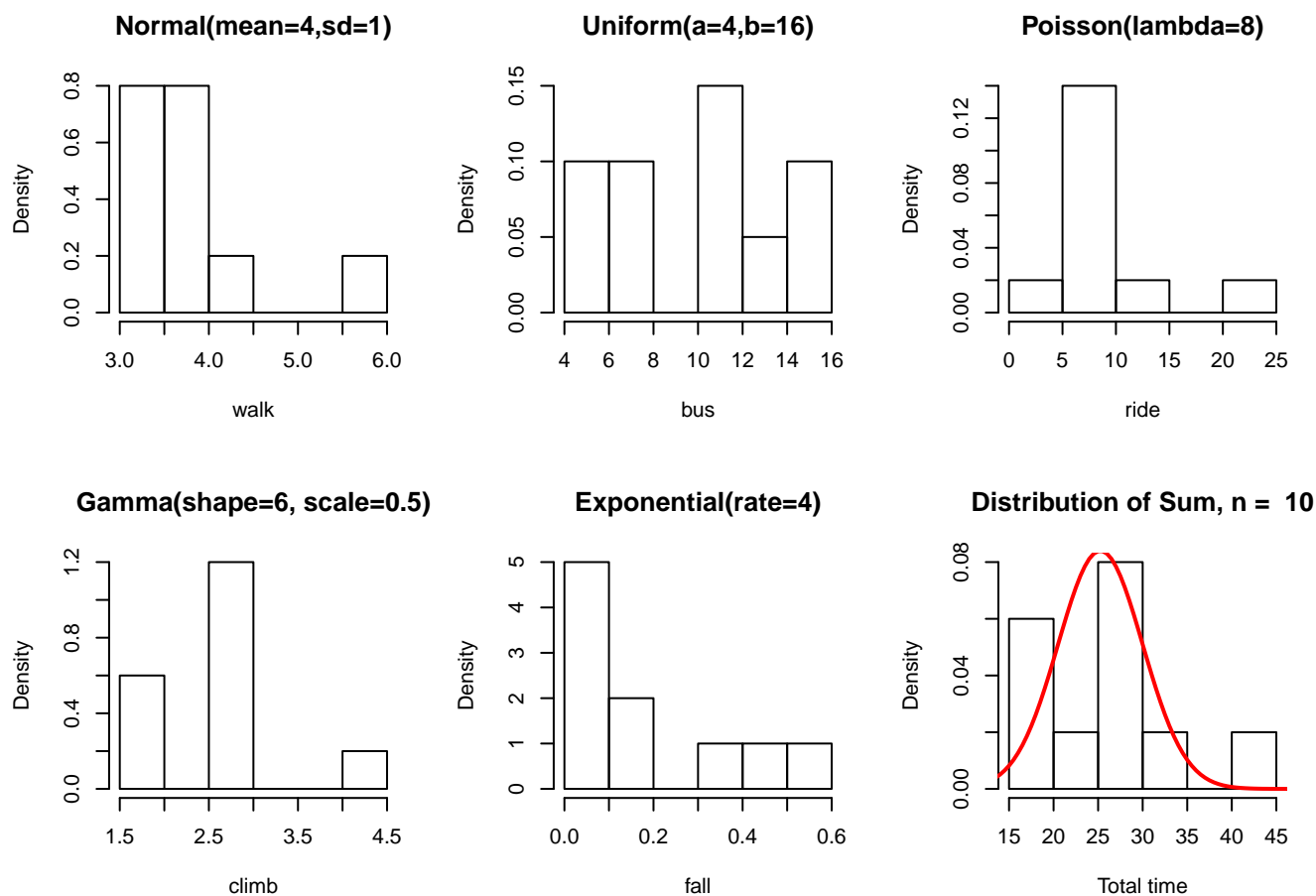
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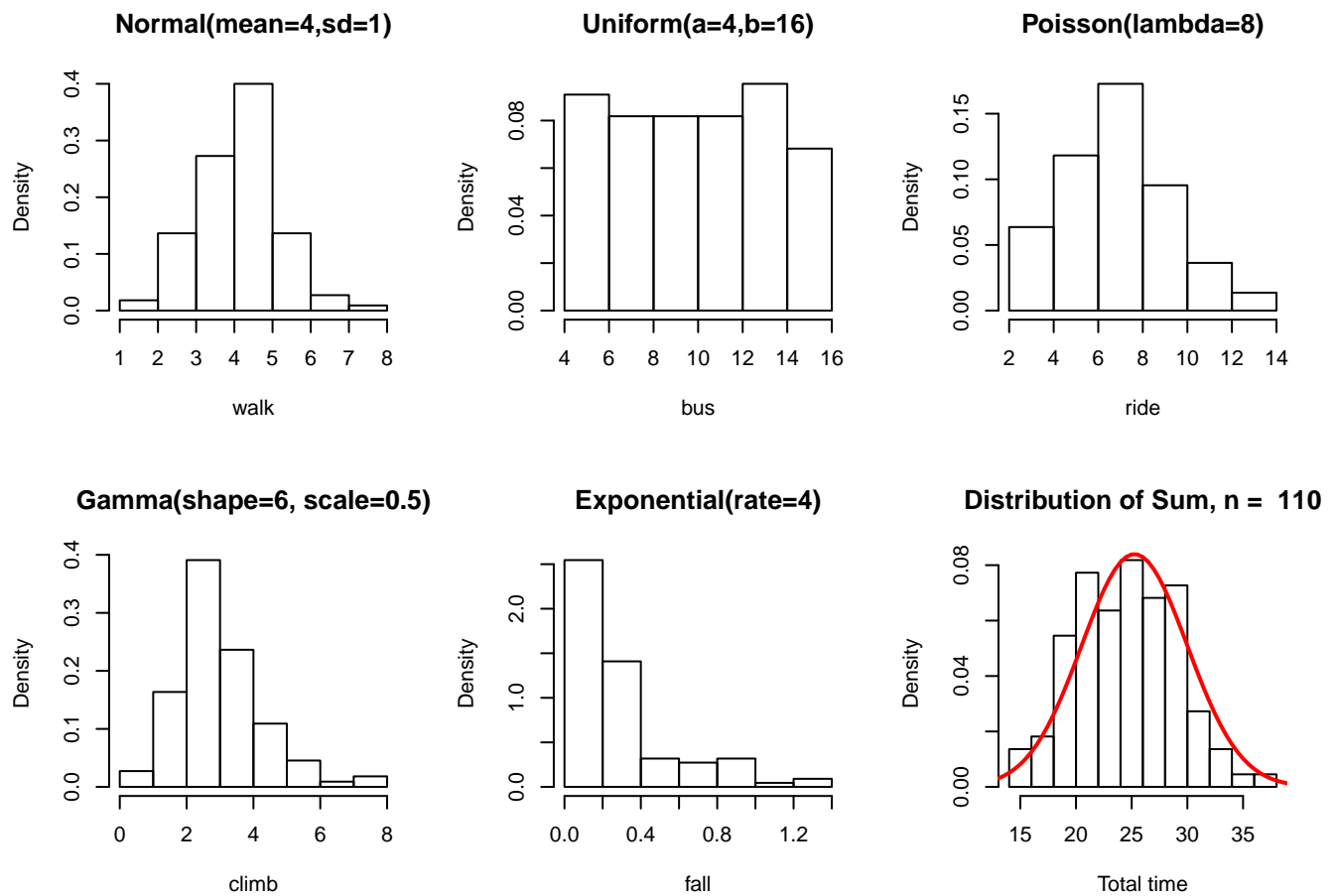
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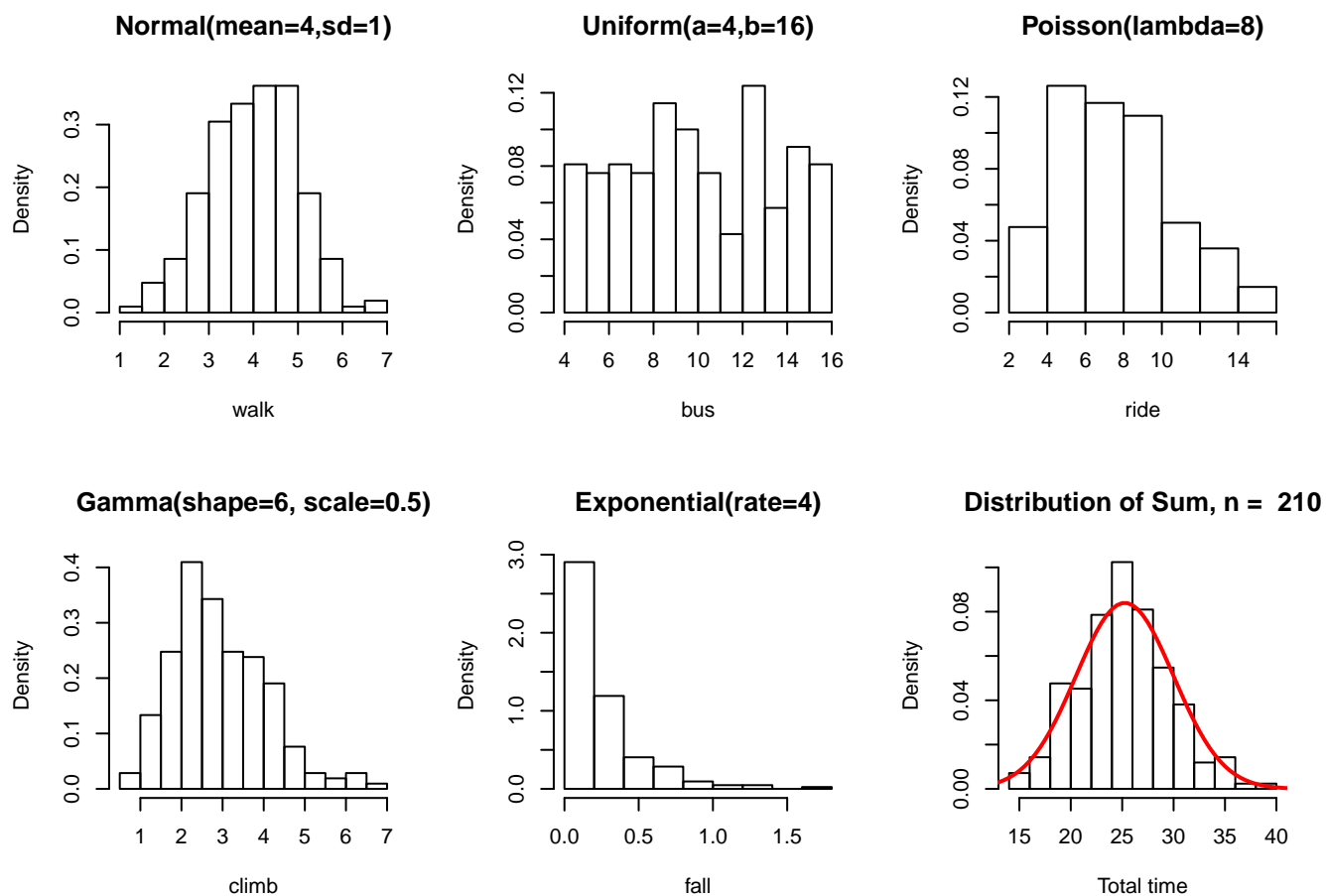
### 1 Lawrence Joseph's Trip to Purvis Hall

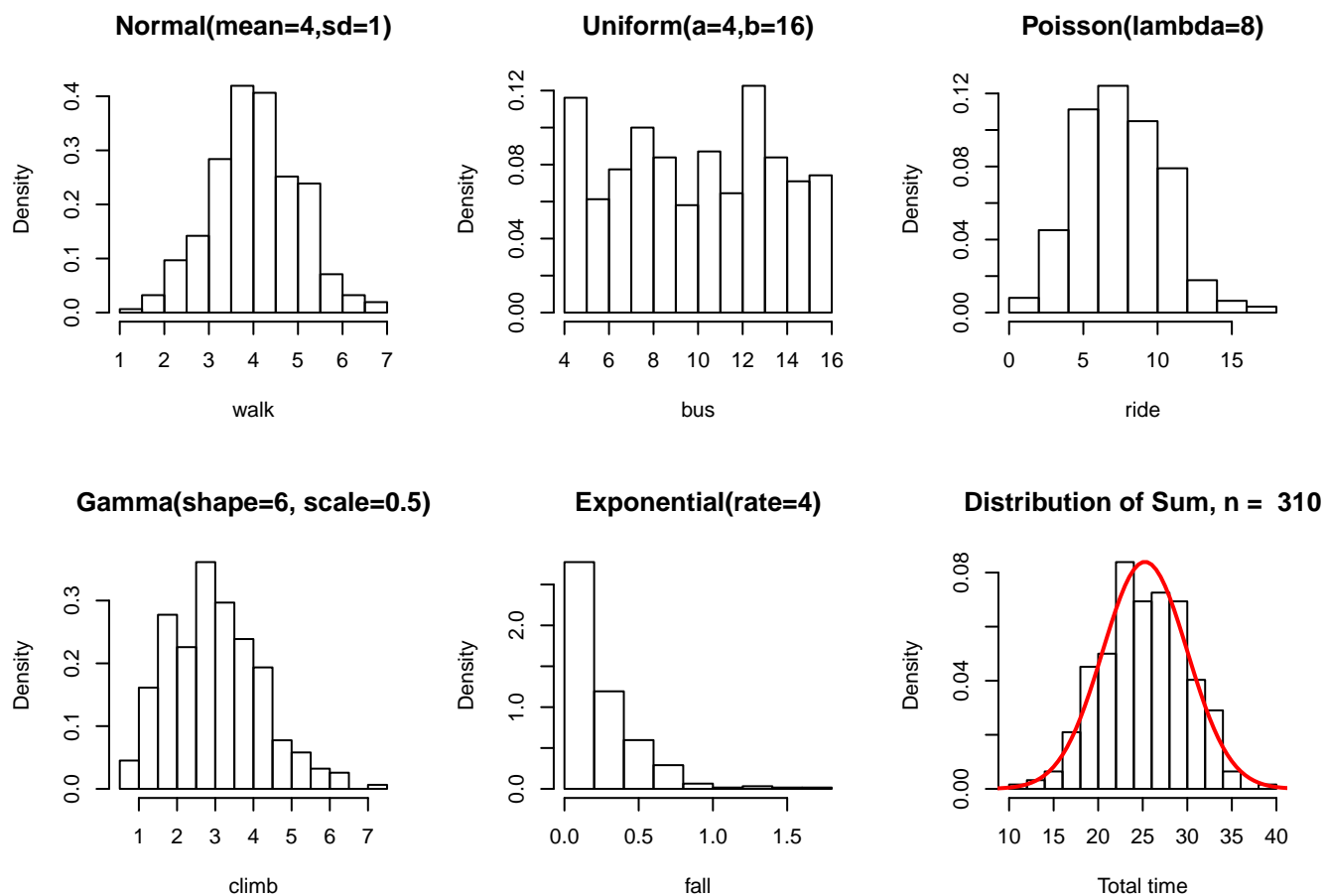


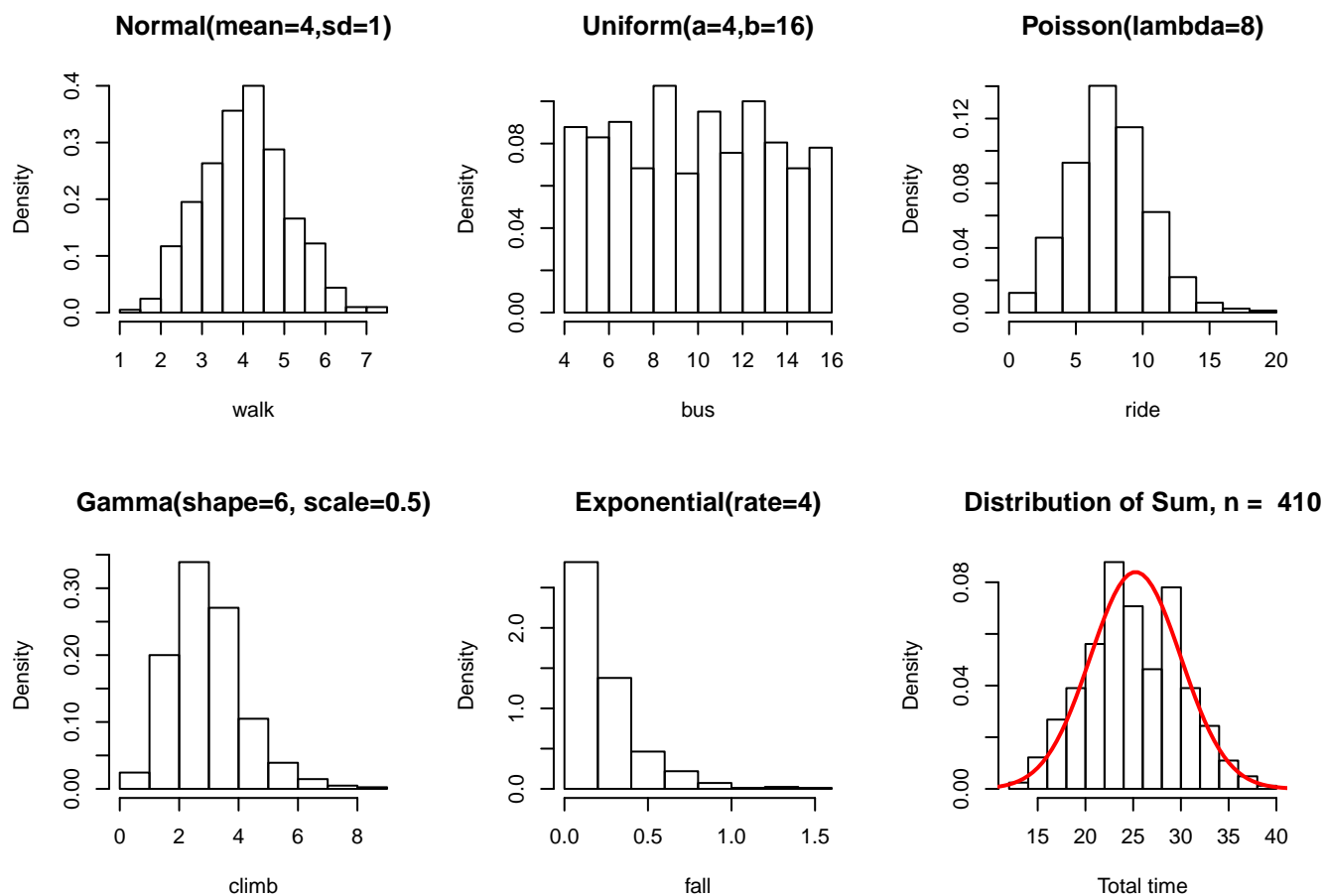
## 2 Proof of CLT in Action with R and knitr::knit\_expand

2.1  $n = 10$ Figure 1: CLT in Action with  $n = 10$

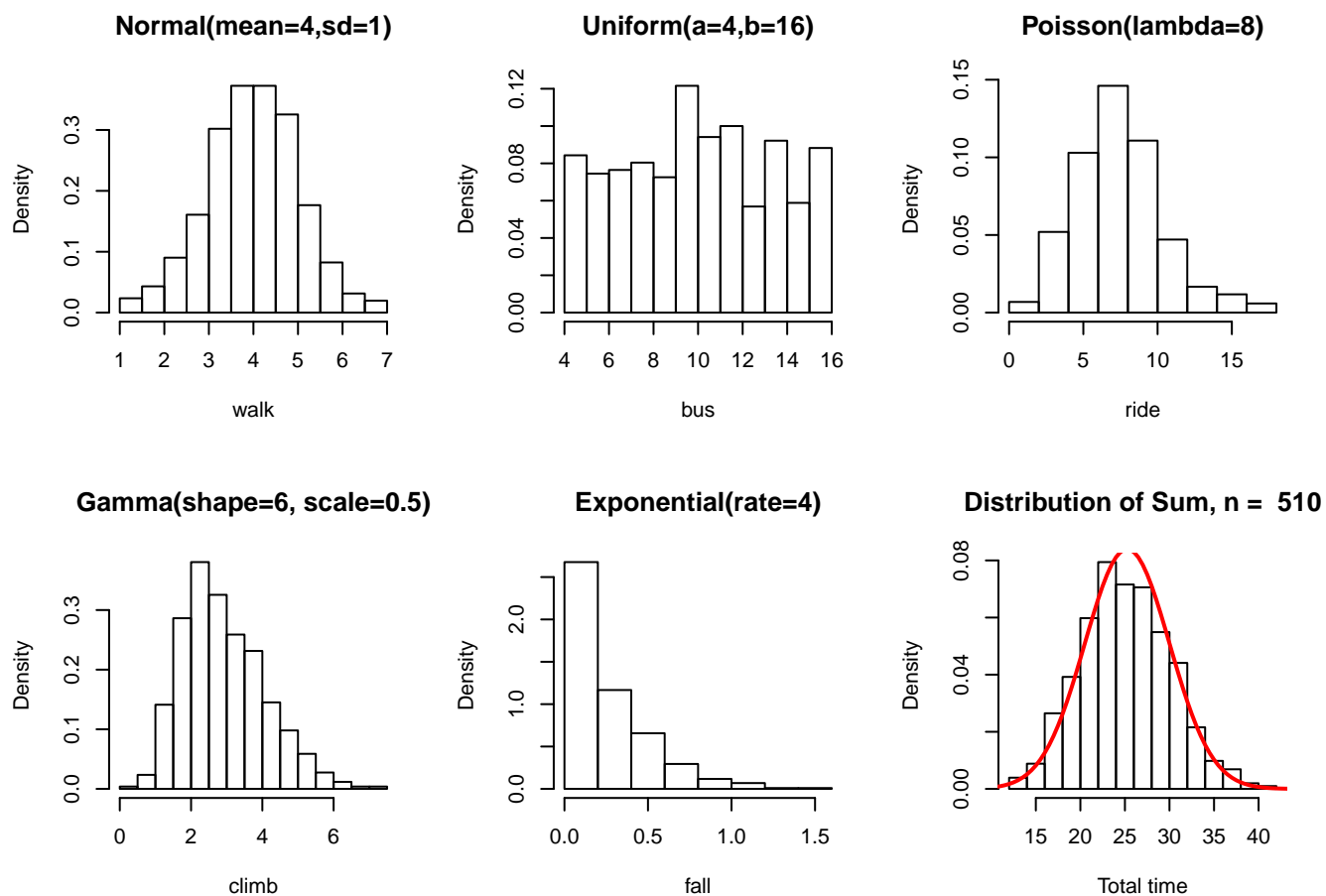
2.2  $n = 110$ Figure 2: CLT in Action with  $n = 110$

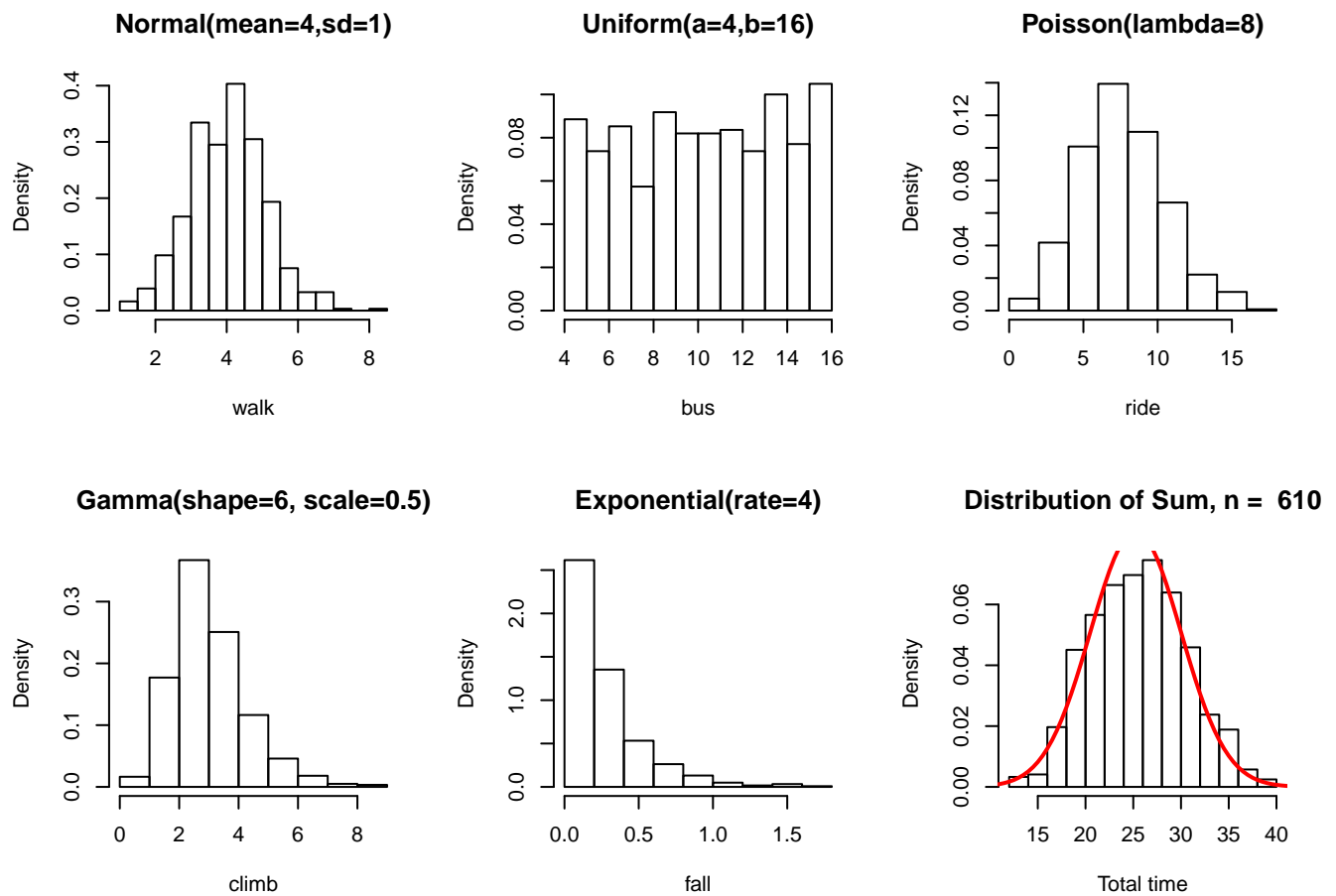
2.3  $n = 210$ Figure 3: CLT in Action with  $n = 210$

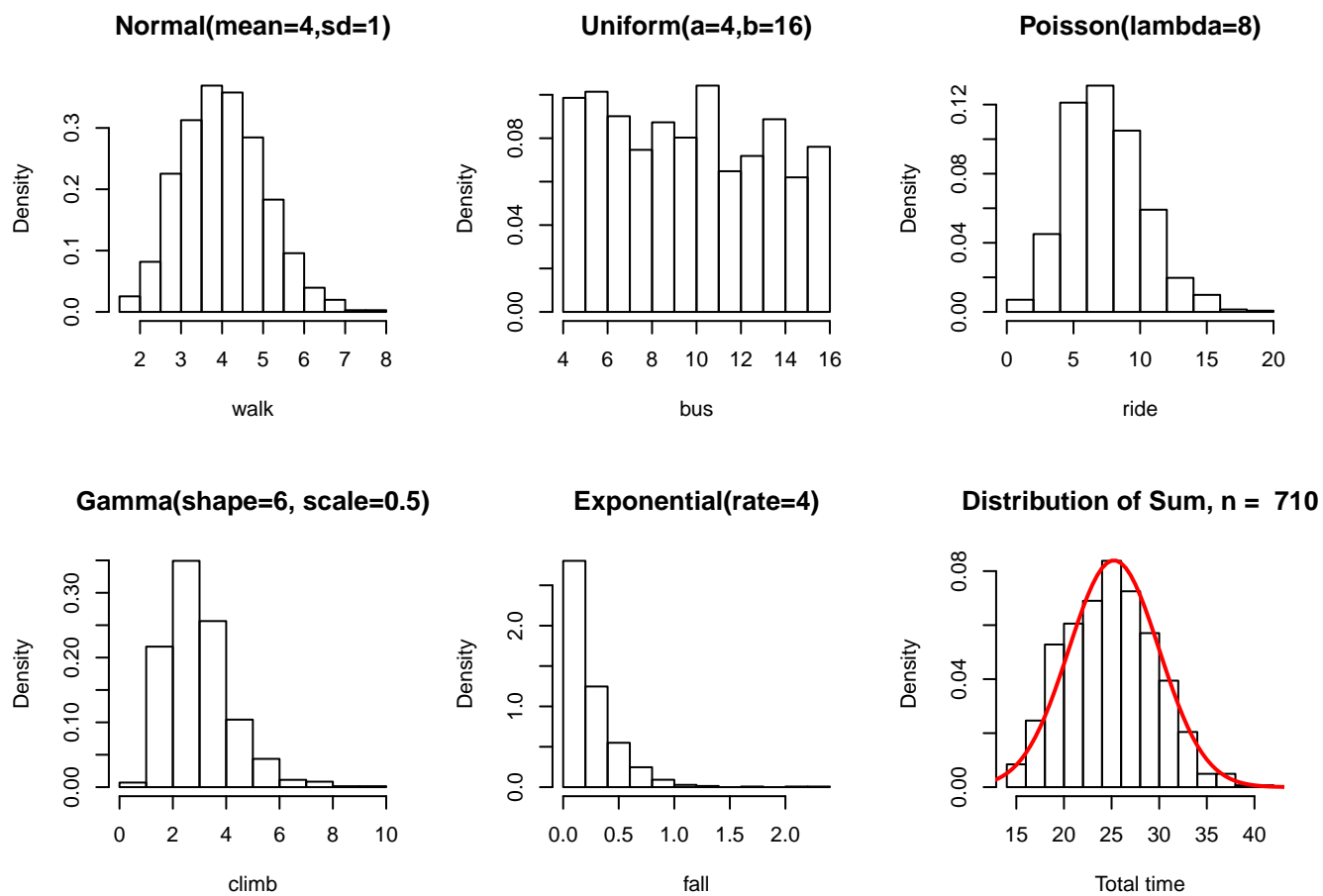
2.4  $n = 310$ Figure 4: CLT in Action with  $n = 310$

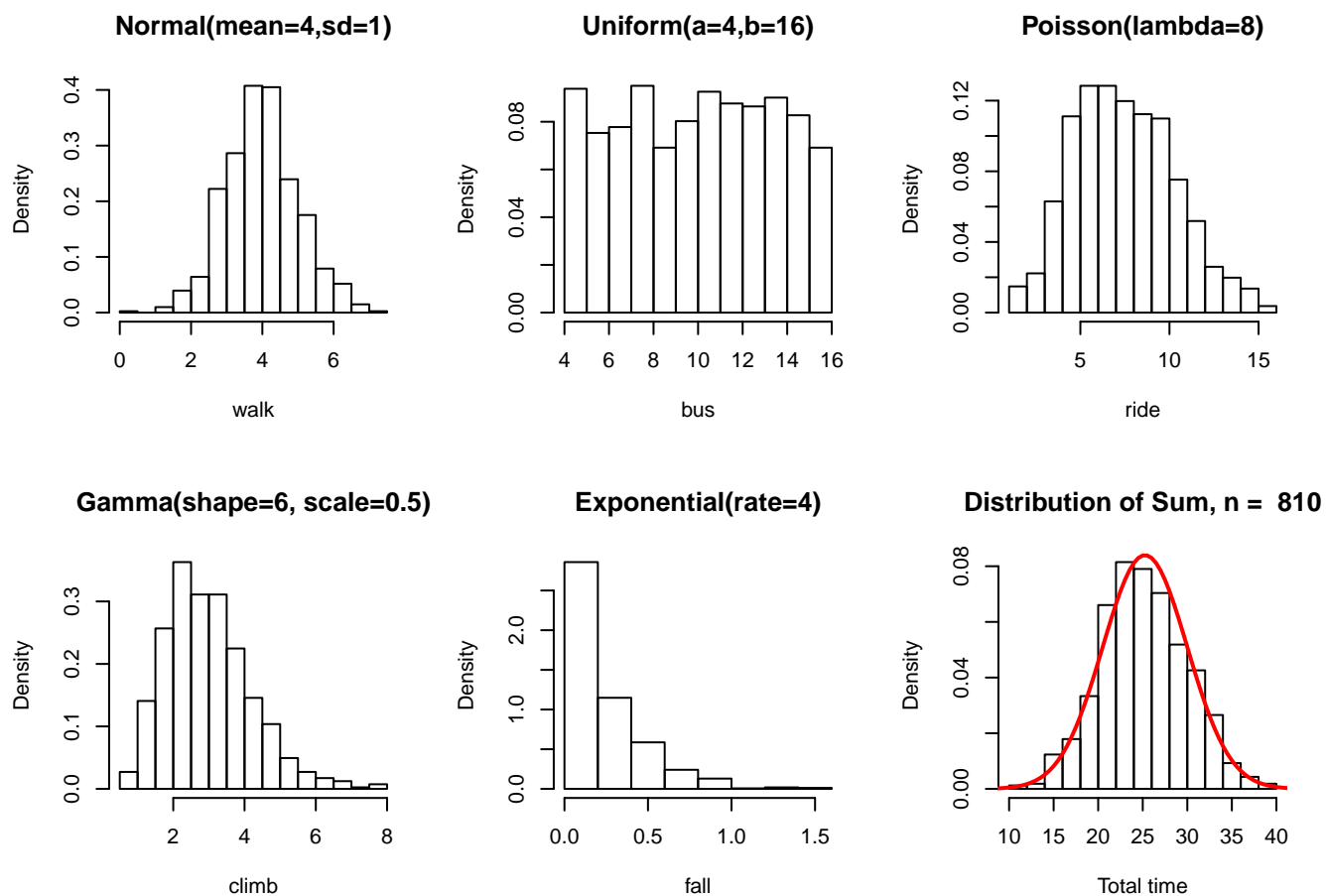
2.5  $n = 410$ Figure 5: CLT in Action with  $n = 410$

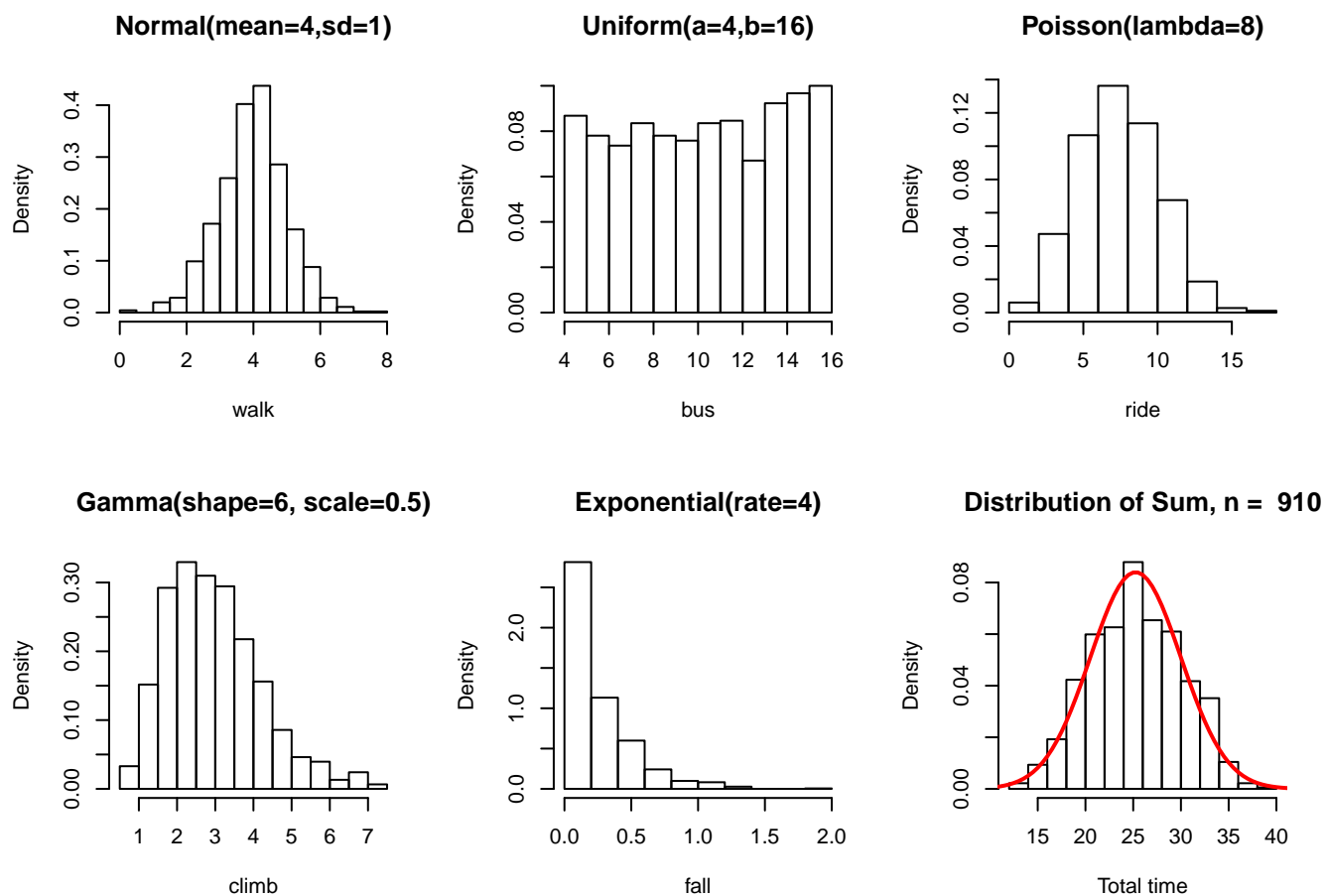


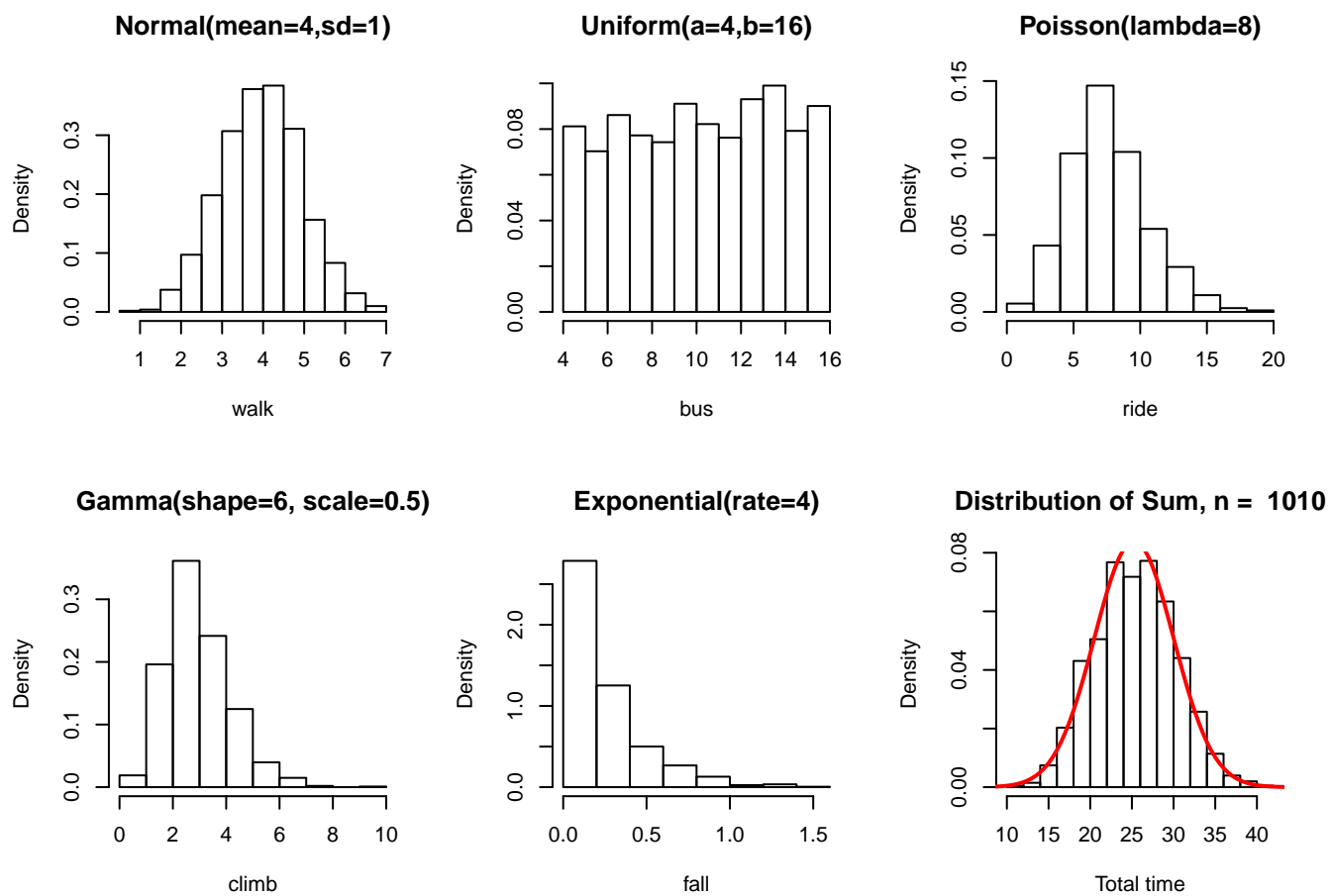
2.6  $n = 510$ Figure 6: CLT in Action with  $n = 510$

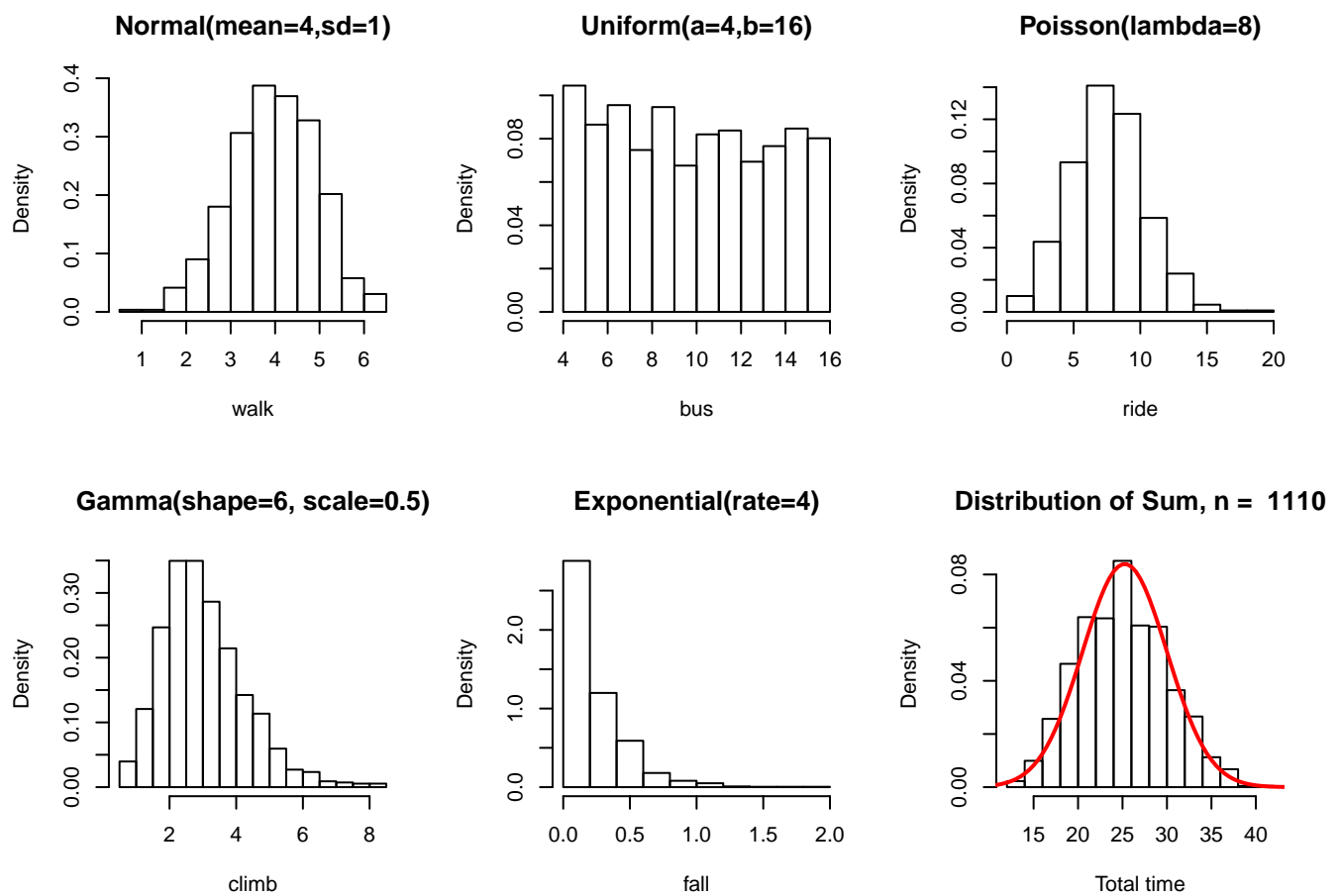
2.7  $n = 610$ Figure 7: CLT in Action with  $n = 610$

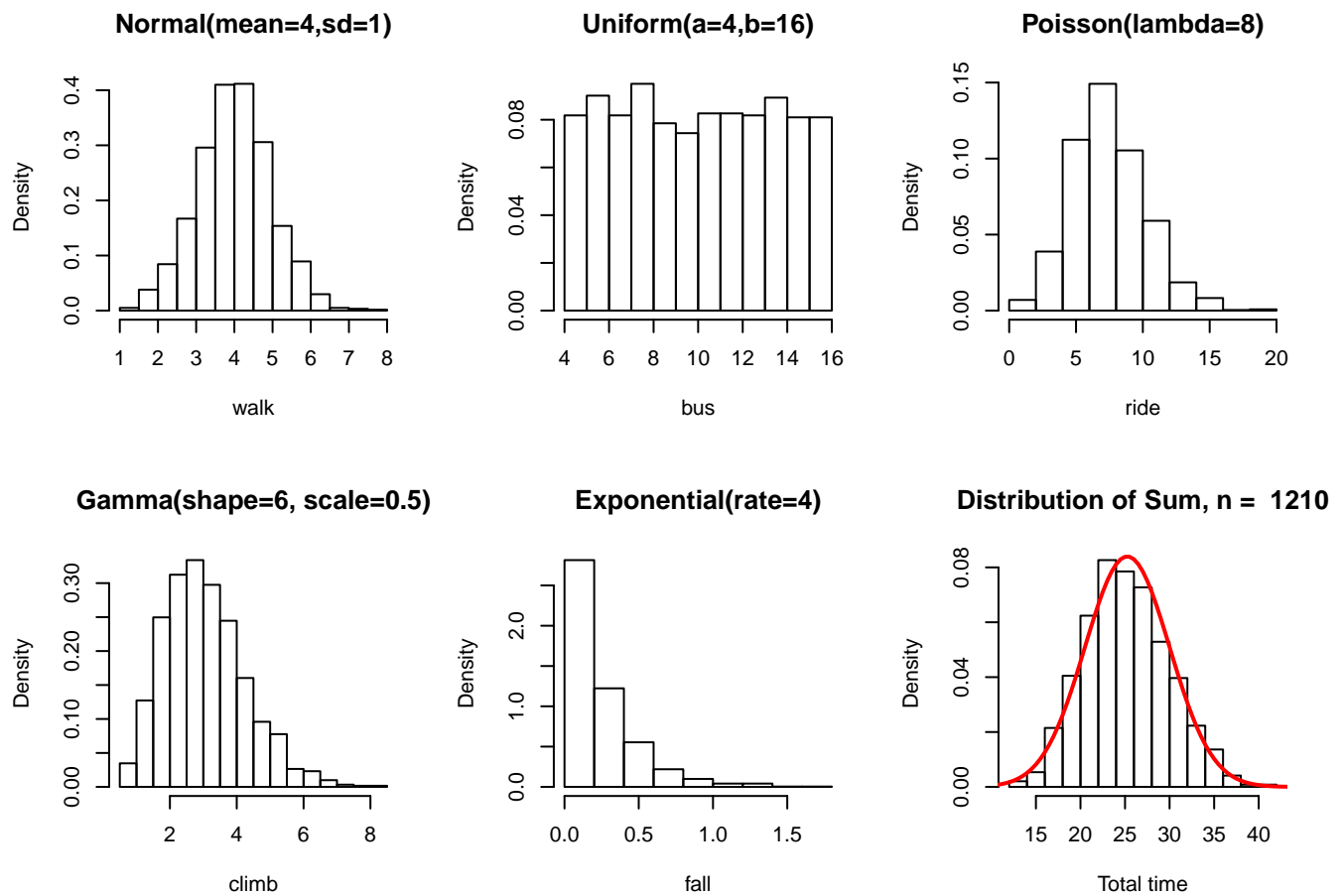
2.8  $n = 710$ Figure 8: CLT in Action with  $n = 710$

2.9  $n = 810$ Figure 9: CLT in Action with  $n = 810$

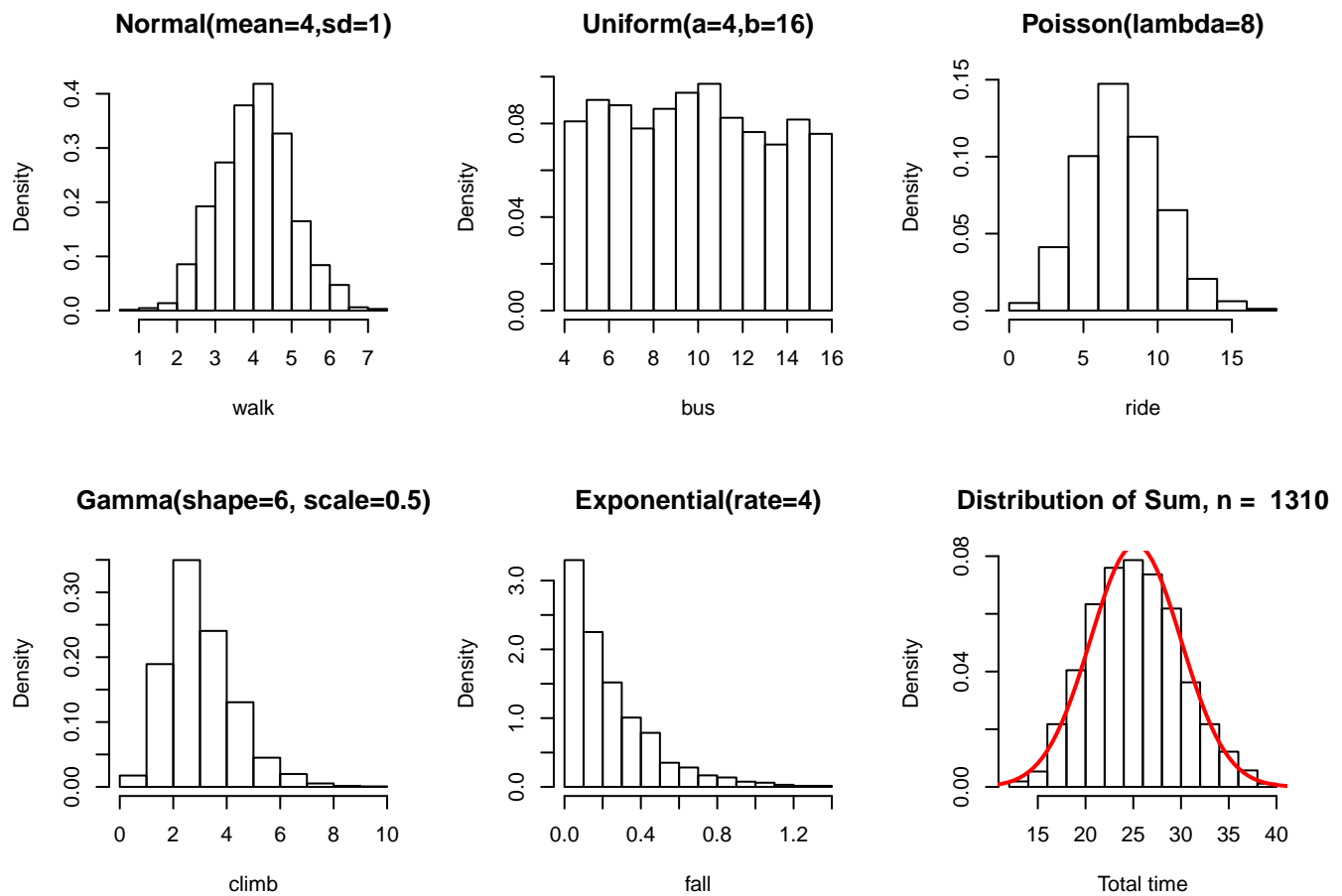
2.10  $n = 910$ Figure 10: CLT in Action with  $n = 910$

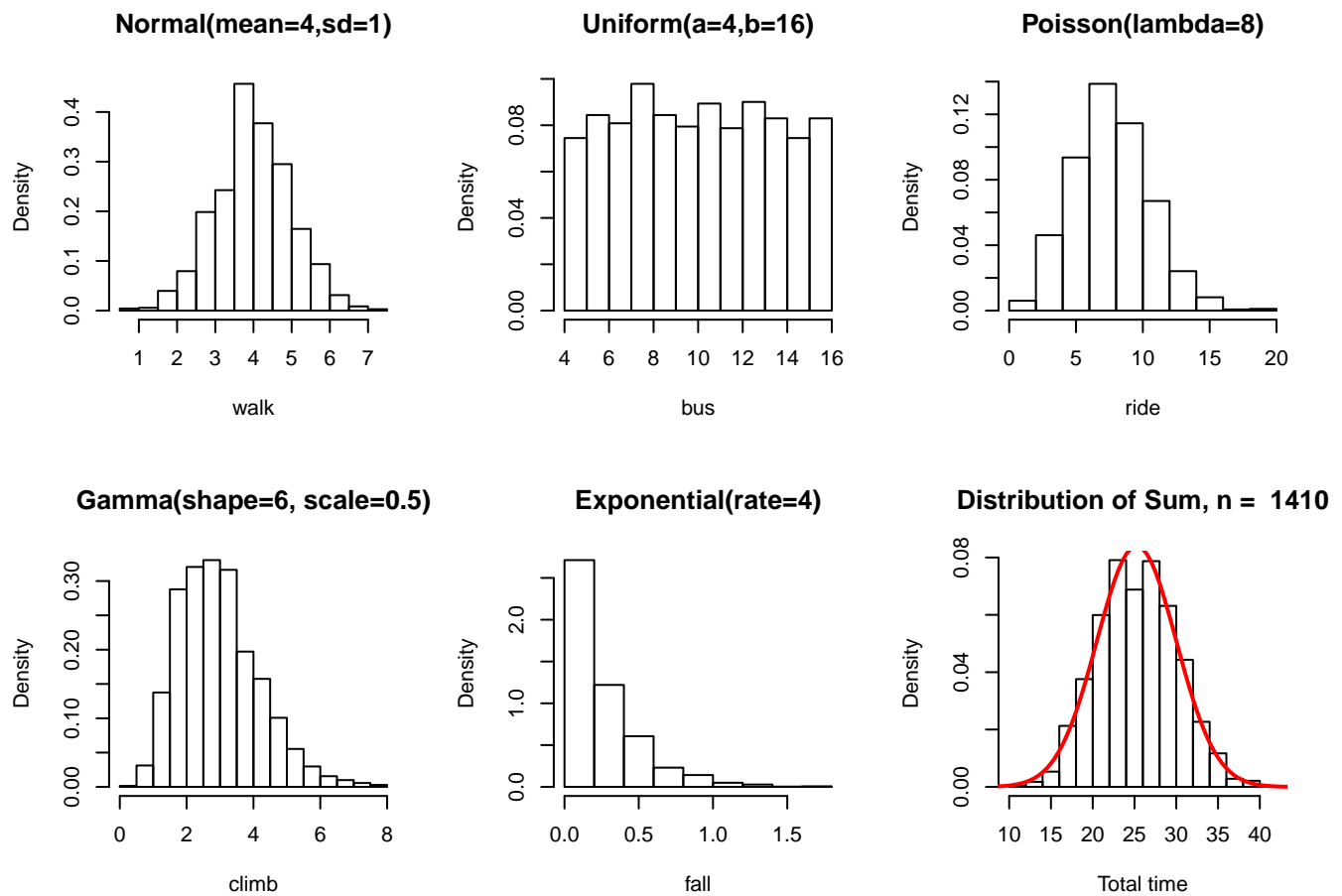
2.11  $n = 1010$ Figure 11: CLT in Action with  $n = 1010$

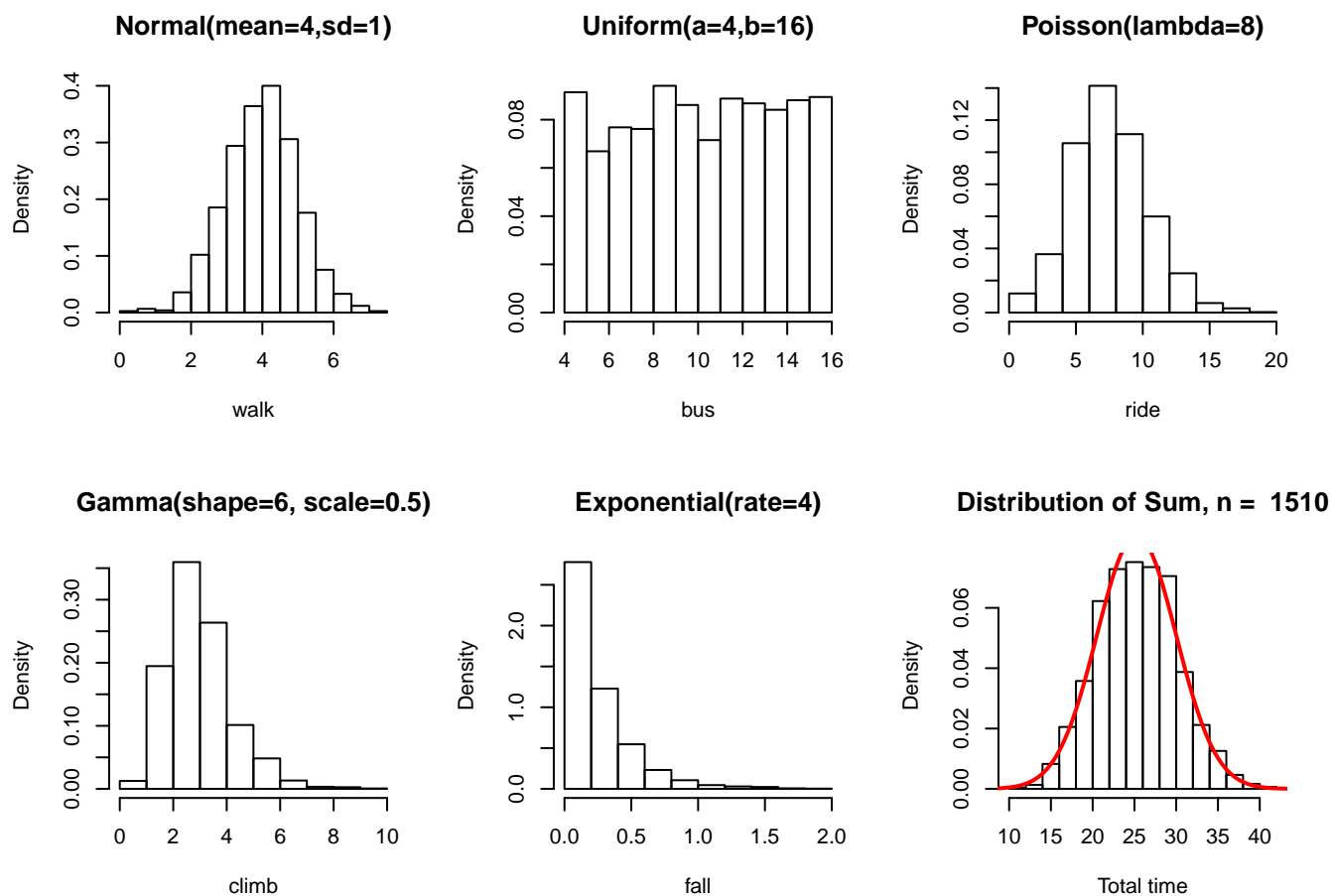
2.12  $n = 1110$ Figure 12: CLT in Action with  $n = 1110$

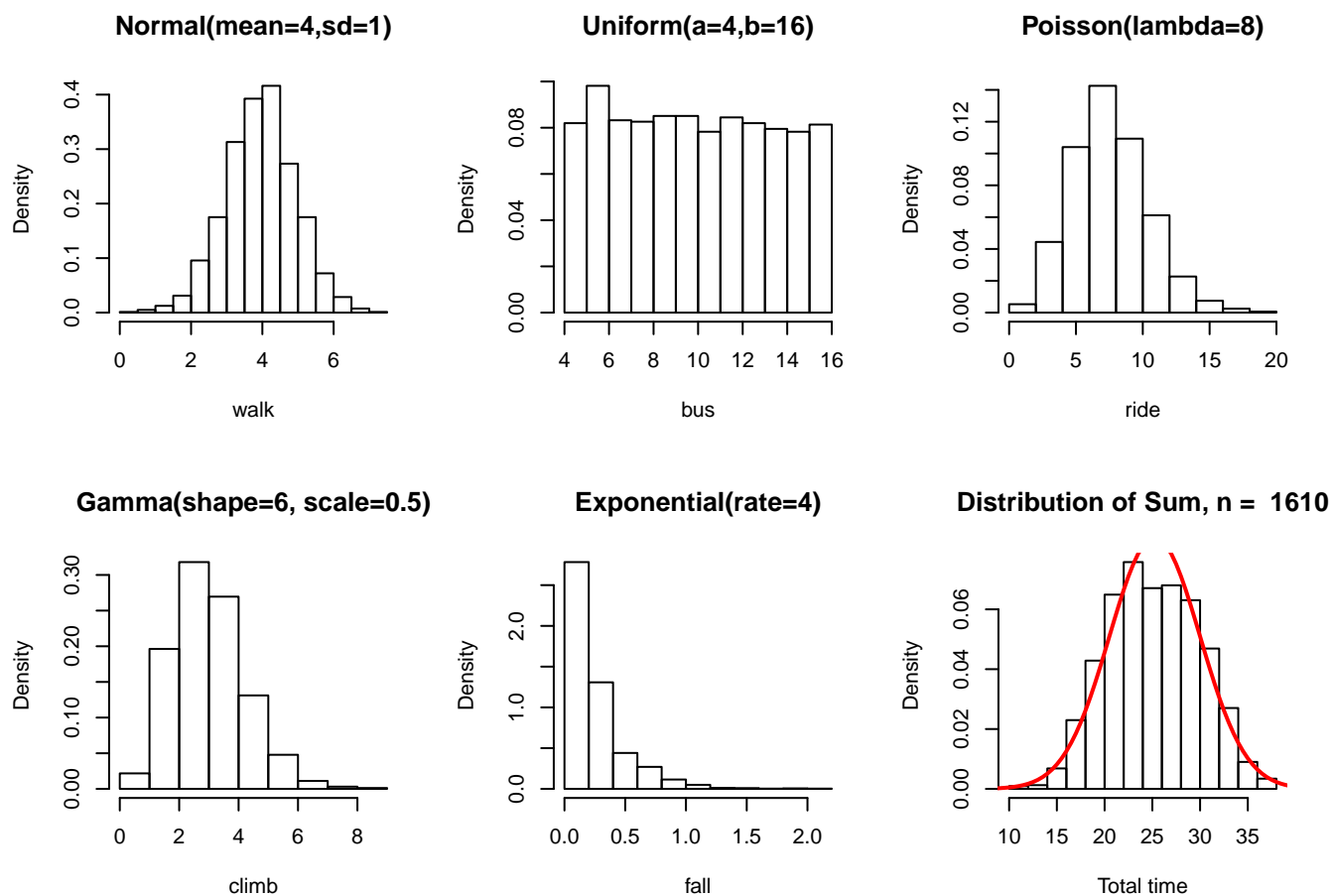
2.13  $n = 1210$ Figure 13: CLT in Action with  $n = 1210$

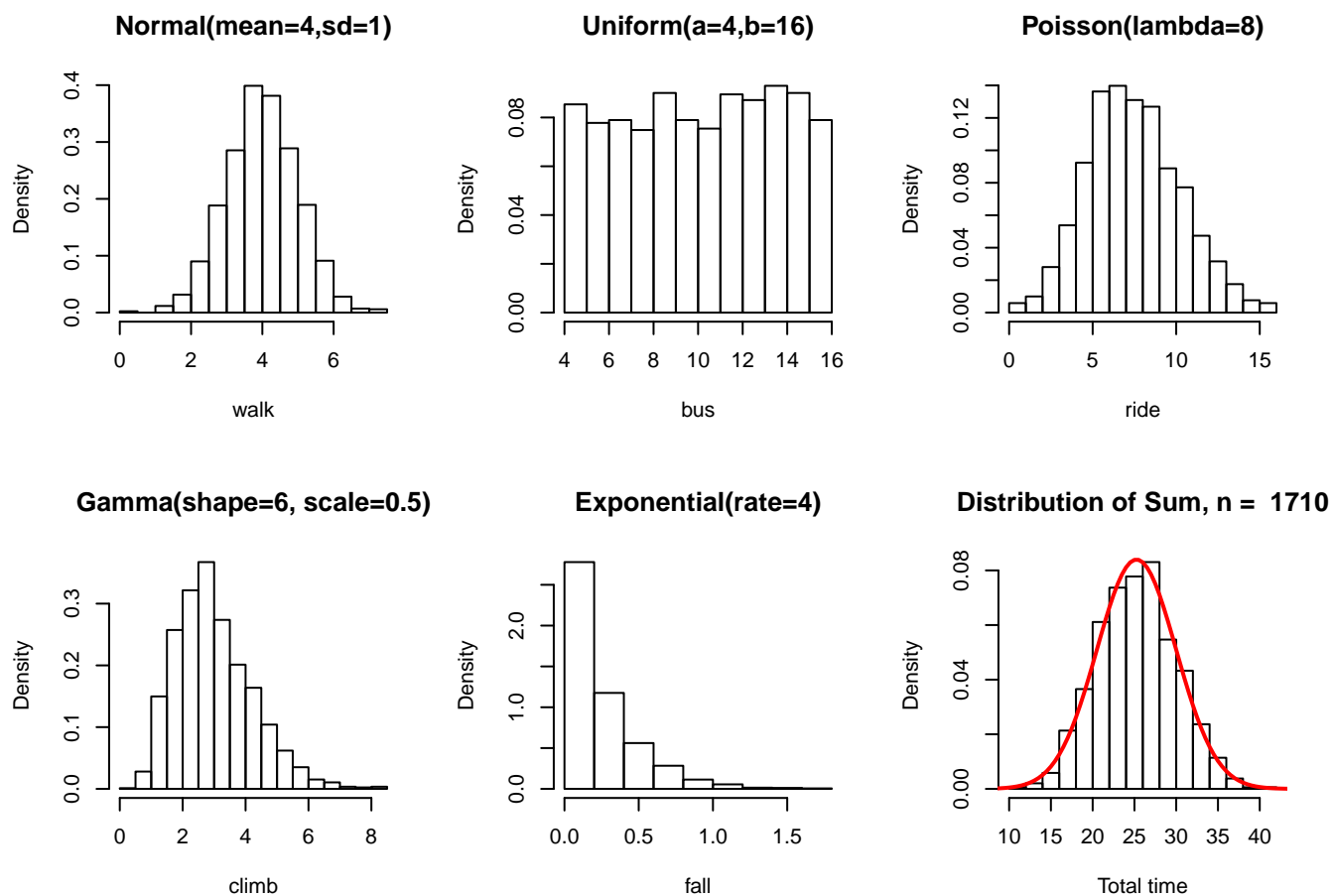


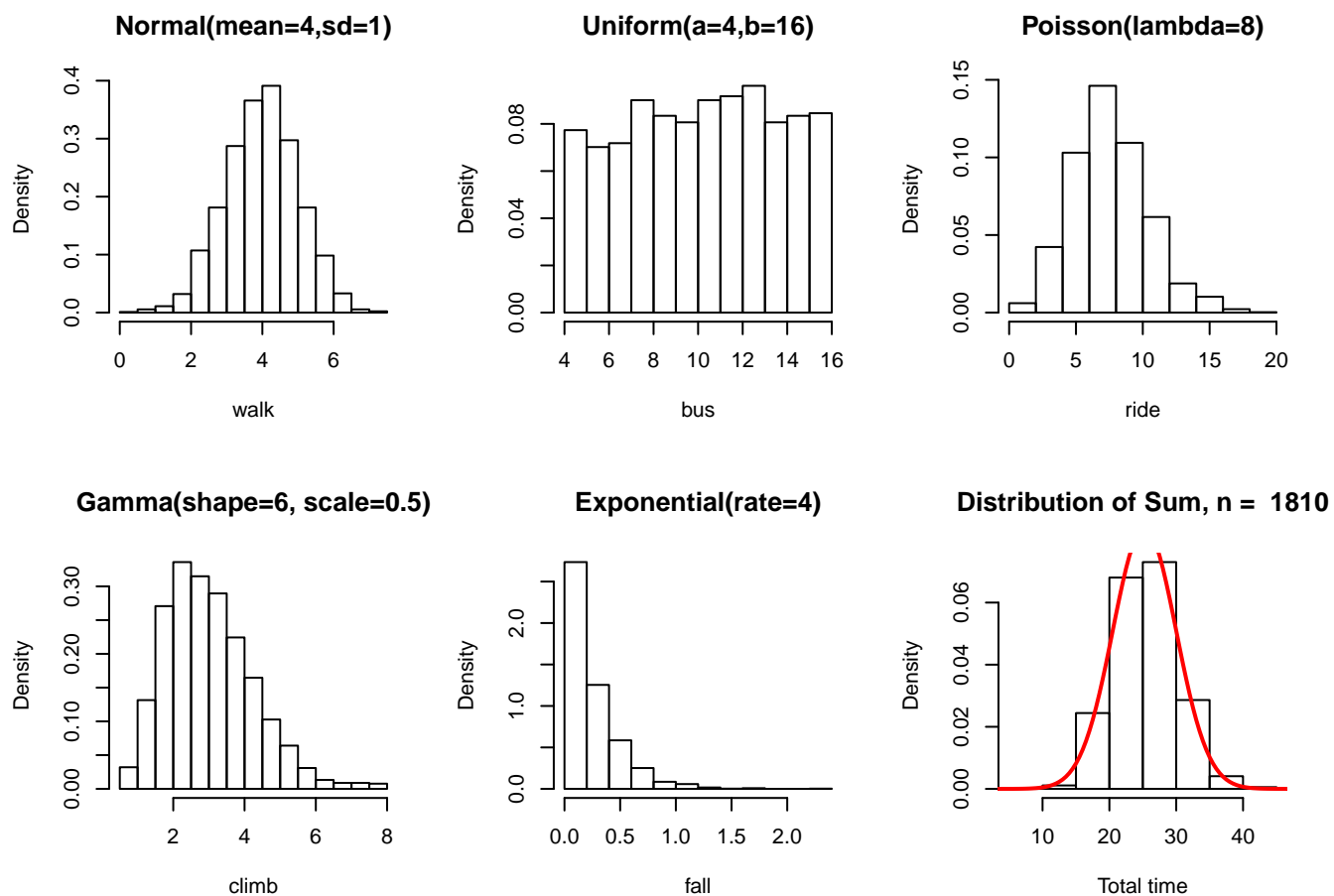
2.14  $n = 1310$ Figure 14: CLT in Action with  $n = 1310$

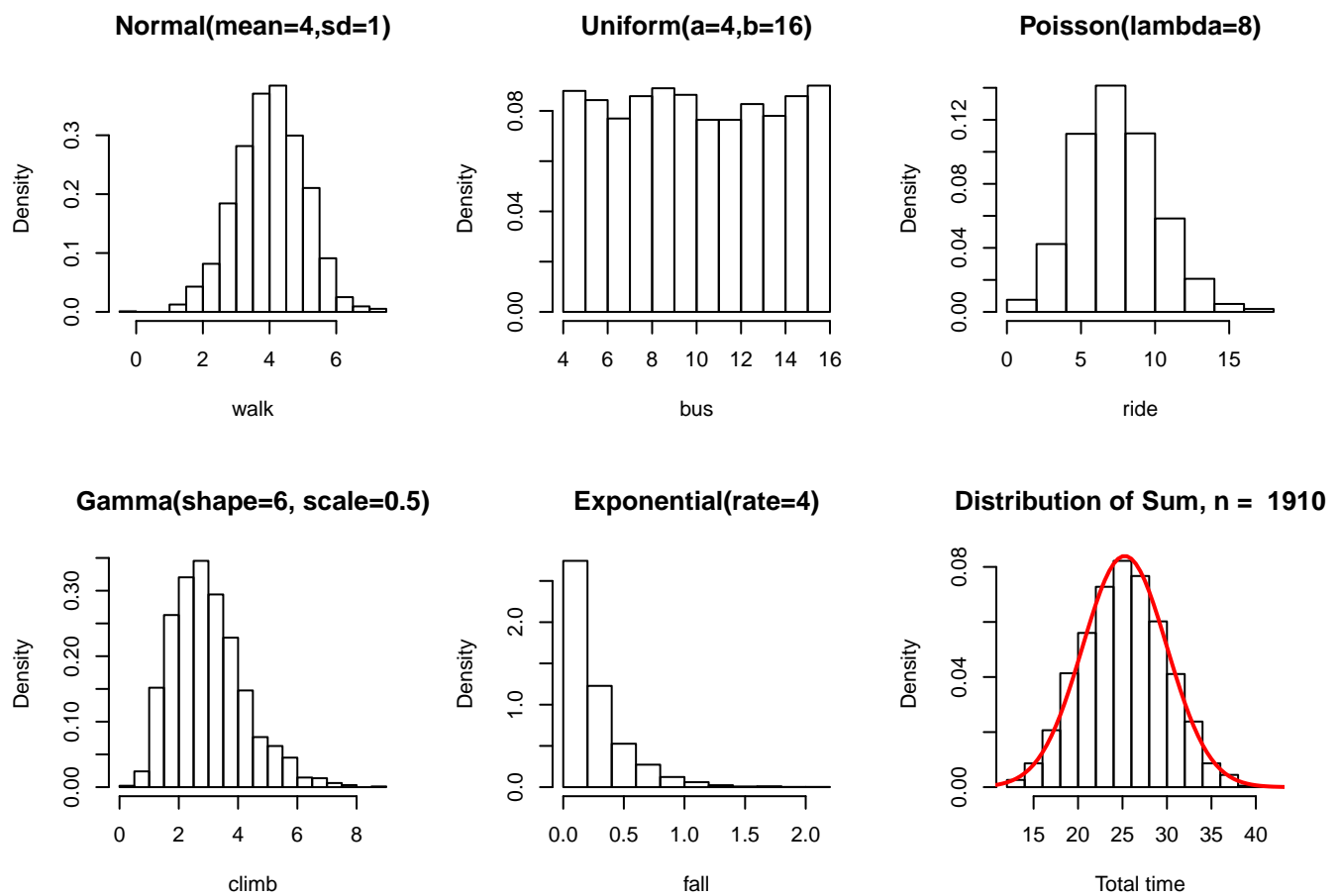
2.15  $n = 1410$ Figure 15: CLT in Action with  $n = 1410$

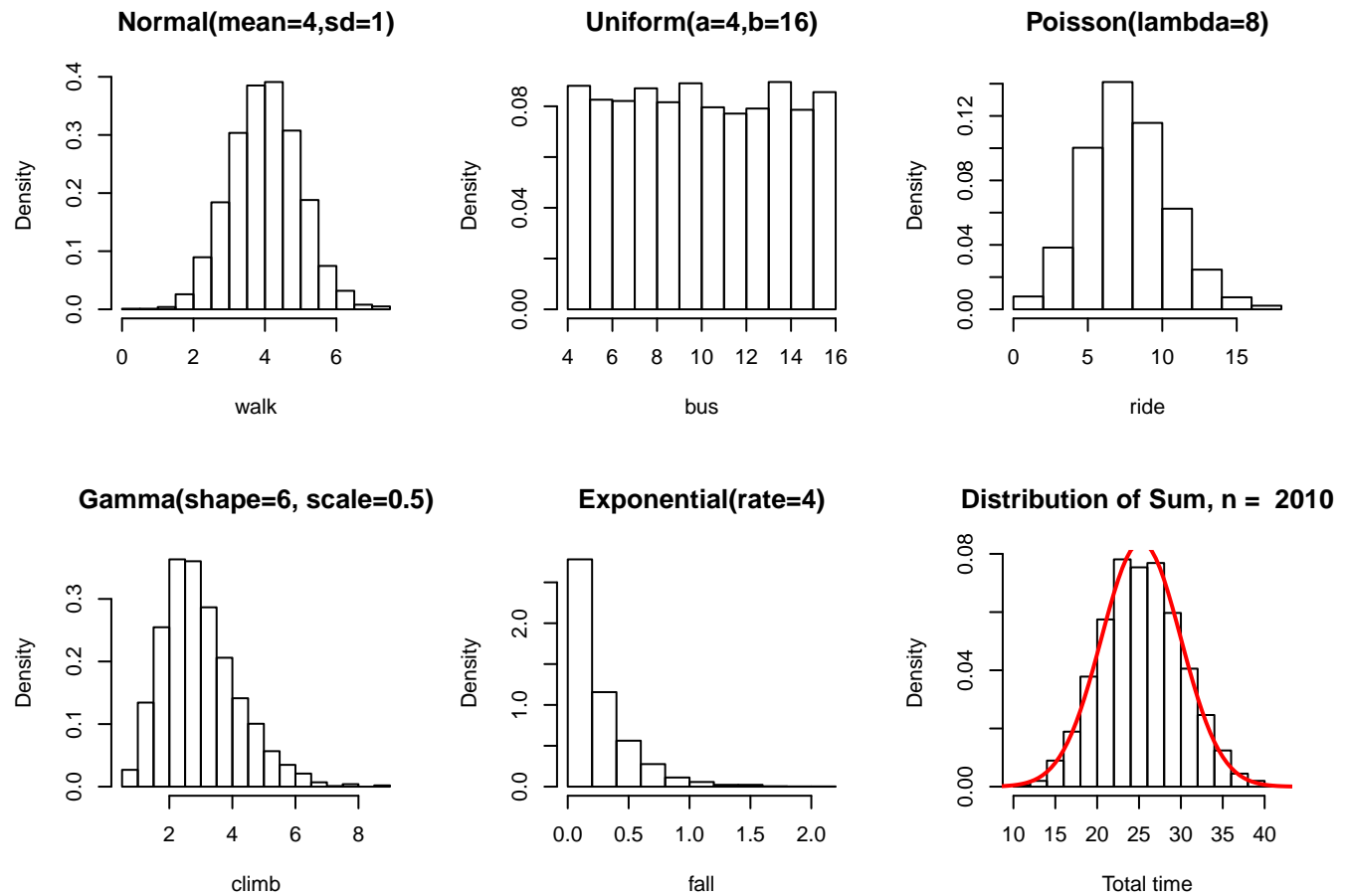
2.16  $n = 1510$ Figure 16: CLT in Action with  $n = 1510$

2.17  $n = 1610$ Figure 17: CLT in Action with  $n = 1610$

2.18  $n = 1710$ Figure 18: CLT in Action with  $n = 1710$

2.19  $n = 1810$ Figure 19: CLT in Action with  $n = 1810$

2.20  $n = 1910$ Figure 20: CLT in Action with  $n = 1910$

2.21  $n = 2010$ Figure 21: CLT in Action with  $n = 2010$ 

## References

- Lawrence Joseph. *Principles of Inferential Statistics in Medicine*, 2010. URL <http://www.medicine.mcgill.ca/epidemiology/Joseph/courses/EPIB-607/notes.pdf>. EPIB 607. 1
- Yihui Xie. *Dynamic Documents with R and knitr*. Chapman and Hall/CRC, Boca Raton, Florida, 2013. URL <http://yihui.name/knitr/>. ISBN 978-1482203530. 1
- Yihui Xie. knitr: A comprehensive tool for reproducible research in R. In Victoria Stodden, Friedrich Leisch, and Roger D. Peng, editors, *Implementing Reproducible Computational Research*. Chapman and Hall/CRC, 2014. URL <http://www.crcpress.com/product/isbn/9781466561595>. ISBN 978-1466561595. 1



Yihui Xie. *knitr: A General-Purpose Package for Dynamic Report Generation in R*, 2015. URL <http://yihui.name/knitr/>. R package version 1.10.5. 1

## A Session Information

```
sessionInfo()

## R version 3.2.0 (2015-04-16)
## Platform: x86_64-pc-linux-gnu (64-bit)
## Running under: Ubuntu 14.04 LTS
##
## locale:
##  [1] LC_CTYPE=en_CA.UTF-8      LC_NUMERIC=C
##  [3] LC_TIME=en_CA.UTF-8      LC_COLLATE=en_CA.UTF-8
##  [5] LC_MONETARY=en_CA.UTF-8  LC_MESSAGES=en_CA.UTF-8
##  [7] LC_PAPER=en_CA.UTF-8     LC_NAME=C
##  [9] LC_ADDRESS=C             LC_TELEPHONE=C
## [11] LC_MEASUREMENT=en_CA.UTF-8 LC_IDENTIFICATION=C
##
## attached base packages:
## [1] stats      graphics  grDevices  utils      datasets
## [6] methods    base
##
## other attached packages:
## [1] knitr_1.10
##
## loaded via a namespace (and not attached):
## [1] magrittr_1.5  formatR_1.2  tools_3.2.0  stringi_0.4-1
## [5] stringr_1.0.0 evaluate_0.7
```