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ECo 634 Lab: Michael France Nelson

Lab 4

1. `pop_sd = 2.4`

`pop_mean = 10.4`

`norm_17 = rnorm(n= 17, mean= pop_mean, sd= pop_sd)`

`norm_30 = rnorm(n= 30, mean= pop_mean, sd= pop_sd)`

`norm_300 = rnorm(n= 300, mean= pop_mean, sd= pop_sd)`

`norm_3000 = rnorm(n= 3000, mean= pop_mean, sd= pop_sd)`

2. `require(here)`

`png(`

`filename = here("lab_04_hist_01.png"),`

`width = 1500, height = 1600,`

`res = 180, units = "px")`

`par(mfrow = c(2, 2))`

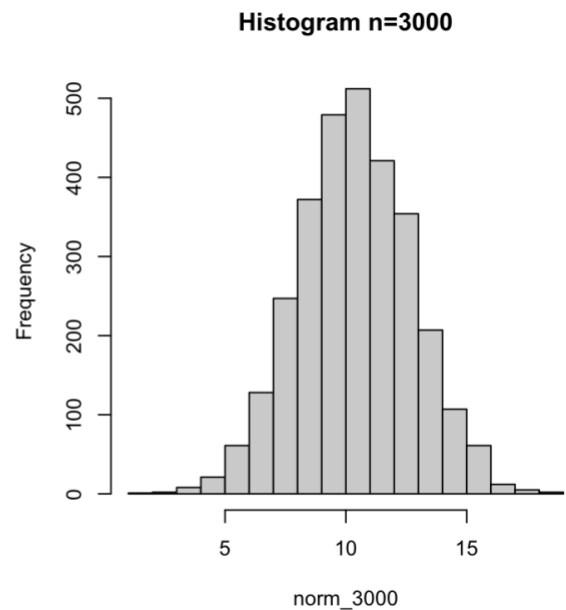
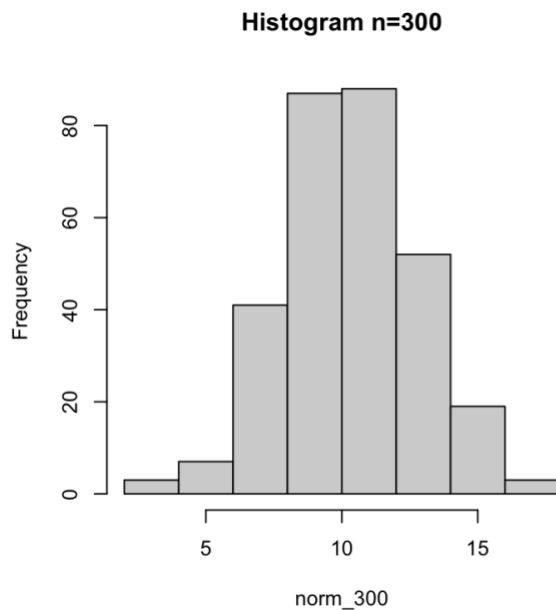
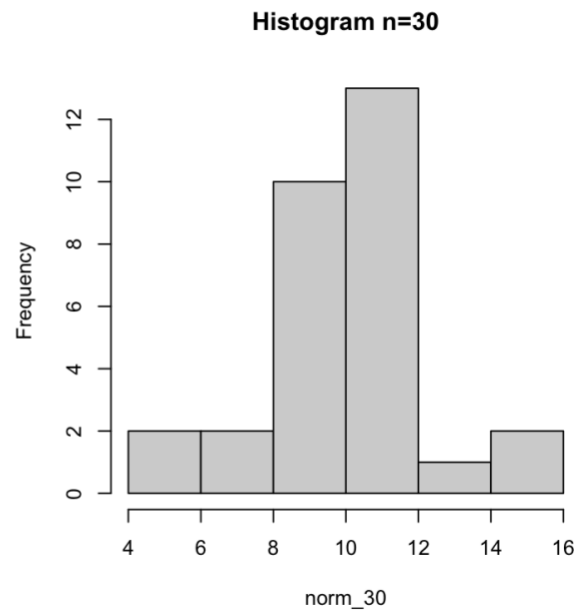
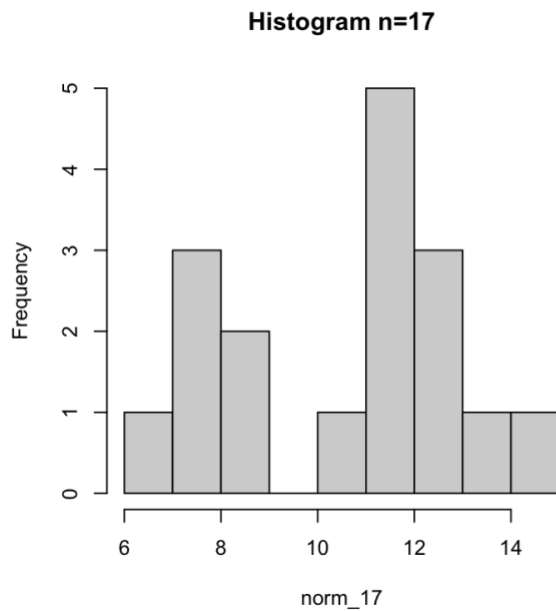
`hist(main= "Histogram n=17", x= norm_17)`

`hist(main= "Histogram n=30", x=norm_30)`

`hist(main= "Histogram n=300", x=norm_300)`

`hist(main= "Histogram n=3000", x=norm_3000)`

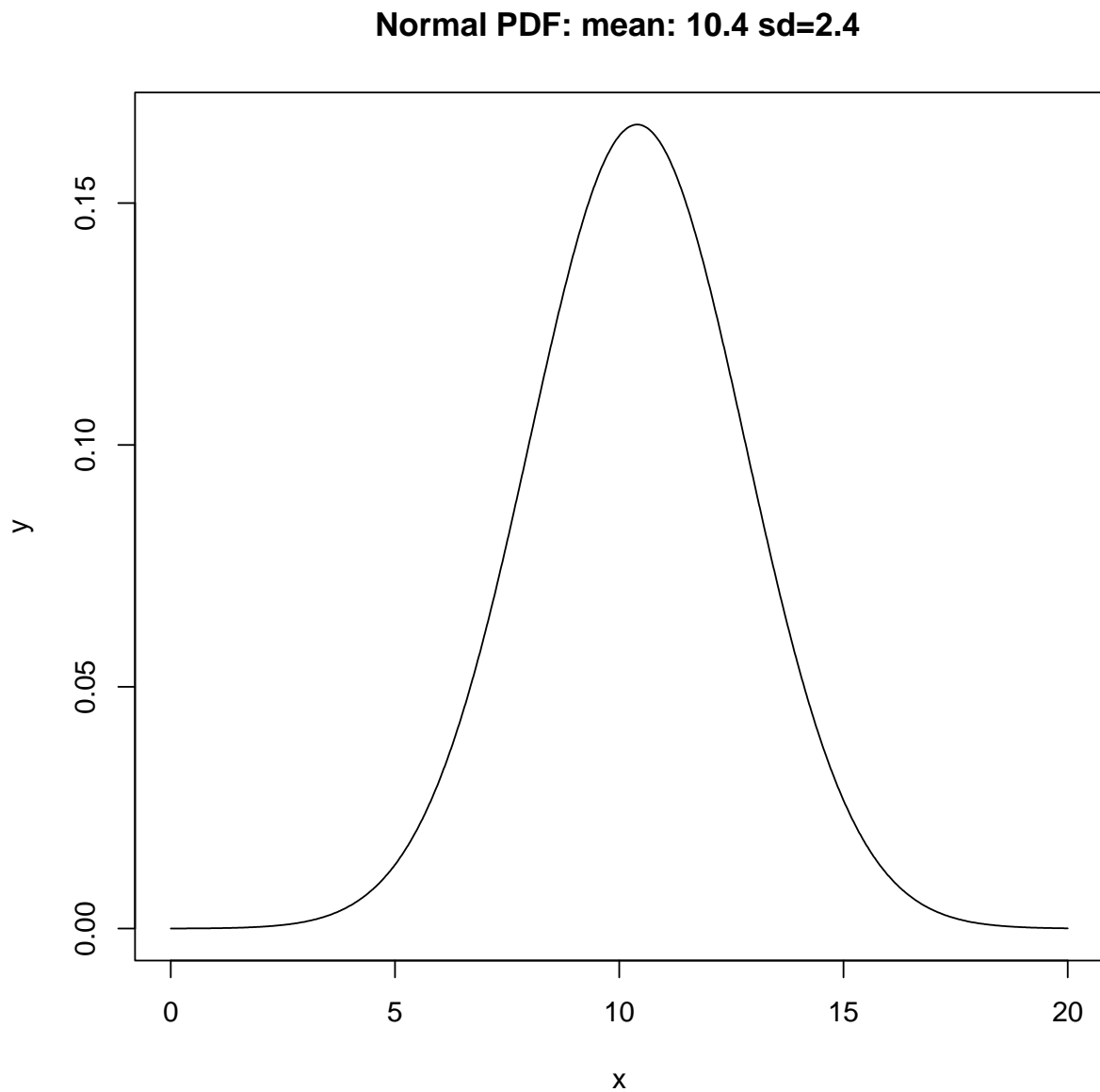
`dev.off()`



- 3.
4. The larger the sample size, the more normal the distribution appears. In the first panel (n=17), the sample size is much smaller than the last panel (n=3000), and it does not show a smooth normal distribution.
5. When you increase the sample size, you reduce uncertainty, so the data becomes more normally distributed in this particular data set.
6. In a standard Normal distribution, the mean is 0 and the standard deviation is  $\pm 1$ .
7. pdf(file= "norm\_1.pdf", bg="white")

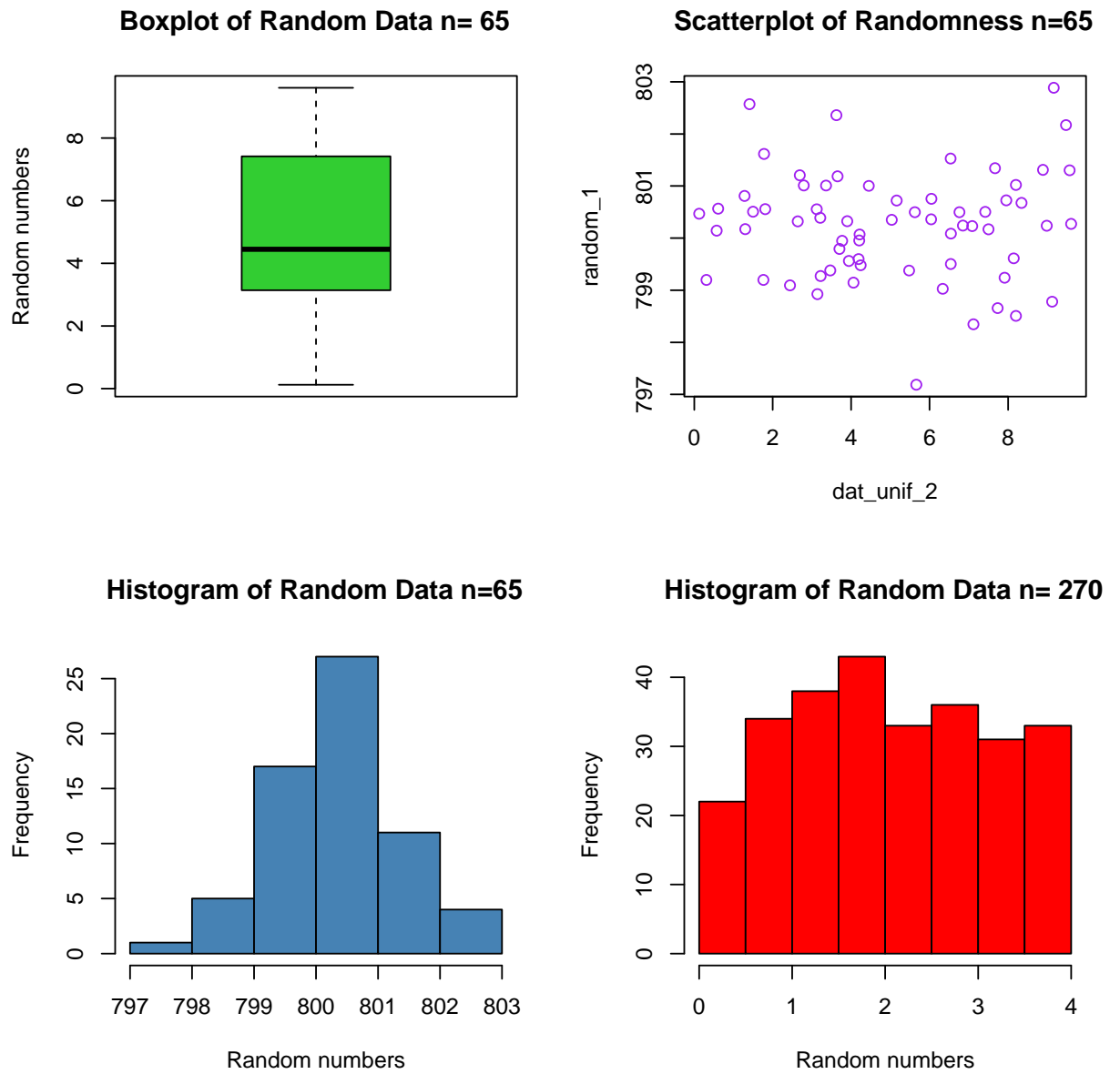
```
x = seq(0, 20, length.out = 1000)
y = dnorm(x, mean=10.4, sd=2.4)
plot(x, y, main = "Normal PDF: mean: 10.4 sd=2.4", type = "l")
dev.off()
```

8.



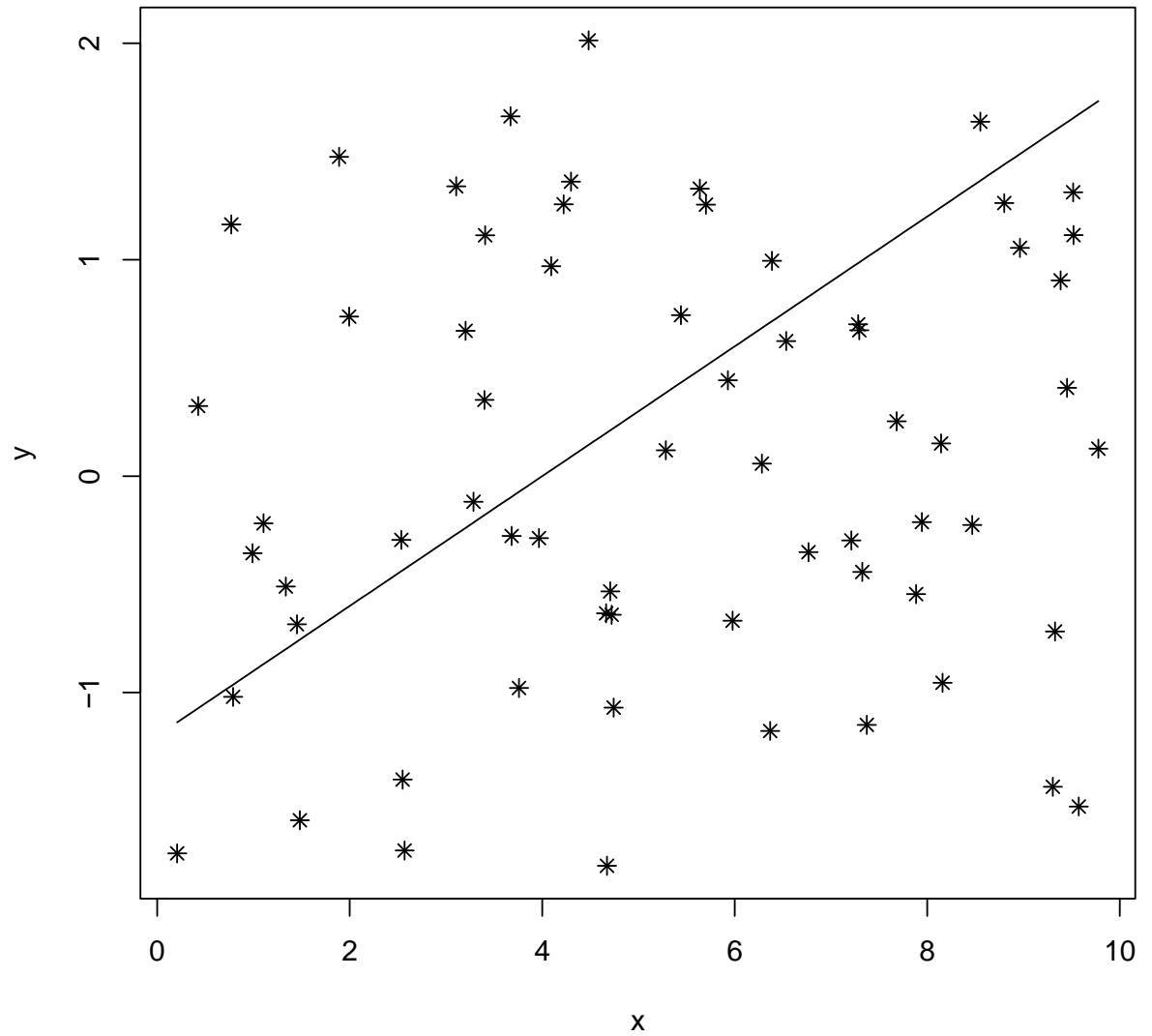
9. `random_1 = rnorm(n=65, mean=800, sd=1)`

10.



```
11. dat_random = data.frame(x = dat_unif_2, y = y_random)
```

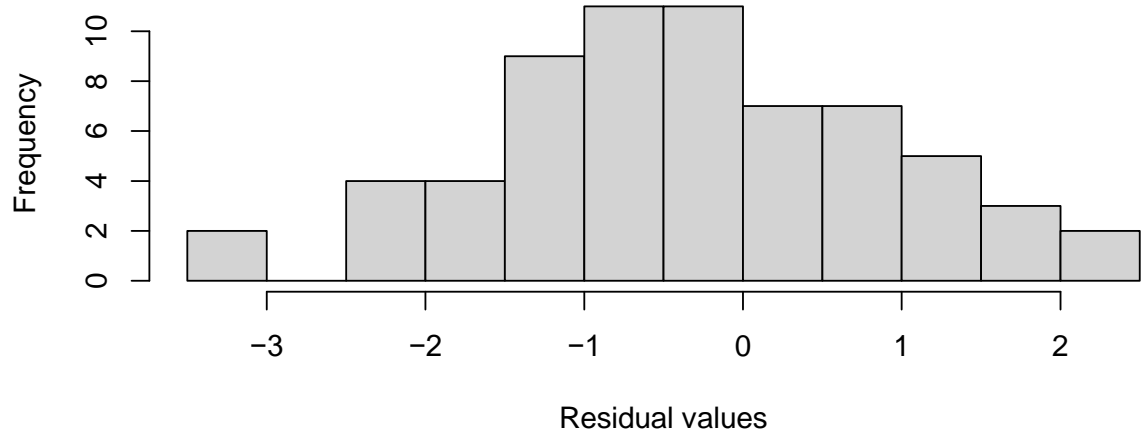
12.



```
13.dat_random$y_predicted=line_point_slope(dat_random$x, guess_x, guess_y,  
    guess_slope)  
    dat_random$resids=y_random - dat_random$y_predicted
```

14.

**Histogram of Model Residuals**



**Residual Scatterplot**

