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Lab04
*Worked with Jessica Bonin

1.
```
lab.mean<-10.4
lab.sd<-2.4
norm_17 = rnorm(n = 17, mean = lab.mean, sd = lab.sd)
norm_30 = rnorm(n = 30, mean = lab.mean, sd = lab.sd)
norm_300 = rnorm(n = 300, mean = lab.mean, sd = lab.sd)
norm_3000 = rnorm(n = 3000, mean = lab.mean, sd = lab.sd)
```

2.
```
png(
  here("assignments", "Plots", "Lab04_Histograms"),
  width=1500, height= 1600, res=180)
par(mfrow = c(2, 2))
hist(norm_17, main="17 Data Points")
hist(norm_30, main= "30 Data Points")
hist(norm_300, main= "300 Data Points")
hist(norm_3000, main= "3000 Data Points")
dev.off()
```

3. Attached file lab04_hist_01

4. The first histogram is not uniform in distribution with some values not represented (7) and has a small number of observations. The second histogram has a greater number of observations but is slightly skewed to the right. The third histogram looks more normally distributed due to additional observations, with a mean of about 11. Finally, the fourth histogram has the greatest number of observations, and is the most normally distributed, with a mean of 10.

5. The shapes of the histograms are different because some have very few observations, and some have many observations. The more observations that are present in a dataset, the more the data will take on a normal distribution.

6. The parameters of a standard normal distribution are the mean (0) and standard deviation (1). The total area under the curve should always add up to 1.

7.
```
png(
here("assignments", "Plots", "norm_1.png"))
x = seq(0, 20, length.out = 1000)
```

```
y = dnorm(x, mean=lab.mean, sd=lab.sd)

plot(x, y, main = "Mean =10.4, SD=2.4", type = "l", xlim = c(0,20 ))
abline(h = 0)

dev.off()
```

8. Attached file Norm_1.png

9.

```
n_pts = 250
x_min = 0.5
x_max = 5.0
x = runif(n = n_pts, min = x_min, max = x_max)
dat = data.frame(x = x, y_observed = rnorm(n_pts))
```

10. Attached file 4Plots.png

11.

```
n_pts = 50
x_min = 5
x_max = 100
x = runif(n = n_pts, min = x_min, max = x_max)
dat4 = data.frame(x = x, y_observed = rnorm(n_pts))
```

12. Attached file ModelFit.png

13.

```
y_predicted<-line_point_slope(dat4$x, guess_x, guess_y, guess_slope)
resids<-dat4$y_predicted-dat4$y_observed
dat4 <- cbind(dat4, y_predicted)
dat4 <- cbind(dat4, resids)
```

14.