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10/03/2021

Lab04

\*Worked with Jessica Bonin

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)

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()

1. Attached file lab04\_hist\_01
2. 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.
3. 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.
4. 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.

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()

1. Attached file Norm\_1.png

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))

1. Attached file 4Plots.png

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))

1. Attached file ModelFit.png

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)

![Chart, histogram

Description automatically generated]()