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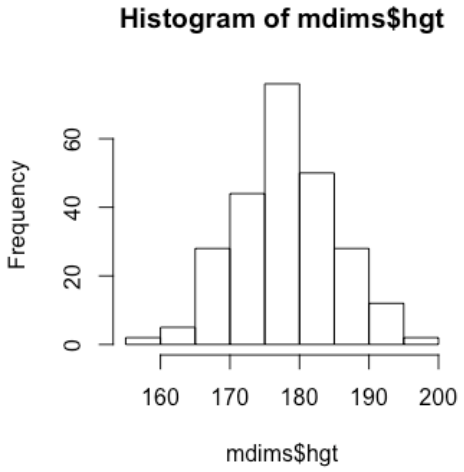
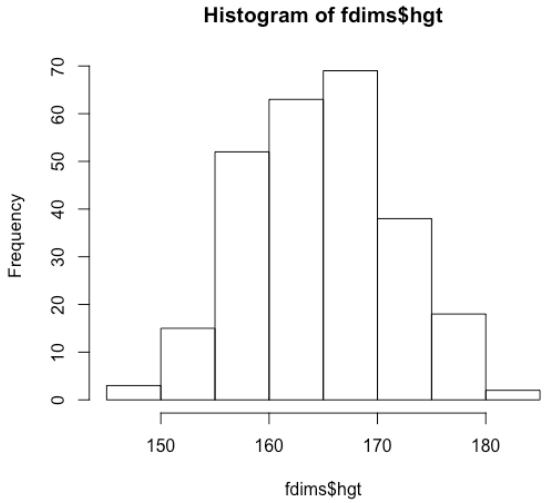
CSC 217
R Assignments
Professor Elahe Vahdani

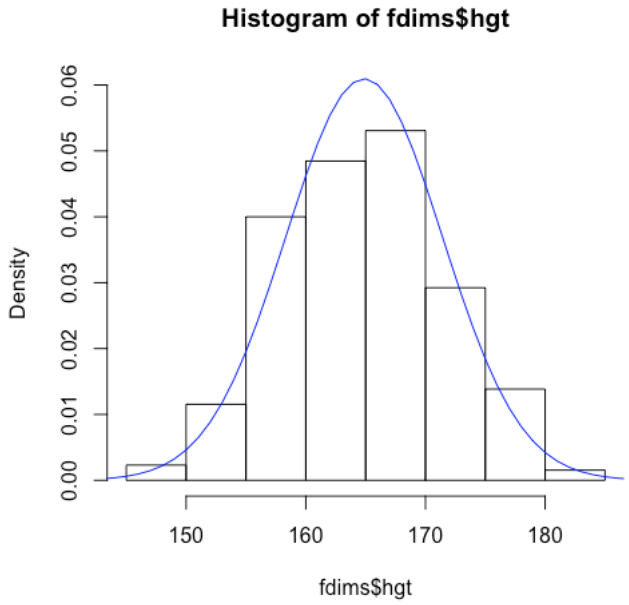
R Assignment 2

Exercise 1





The graphs have normal distribution. The data is not skewed and is not leaning to either side.



Exercise 2

The graph shows a fairly normal distribution. The values seem to exceed the left side more than the right of the line created.

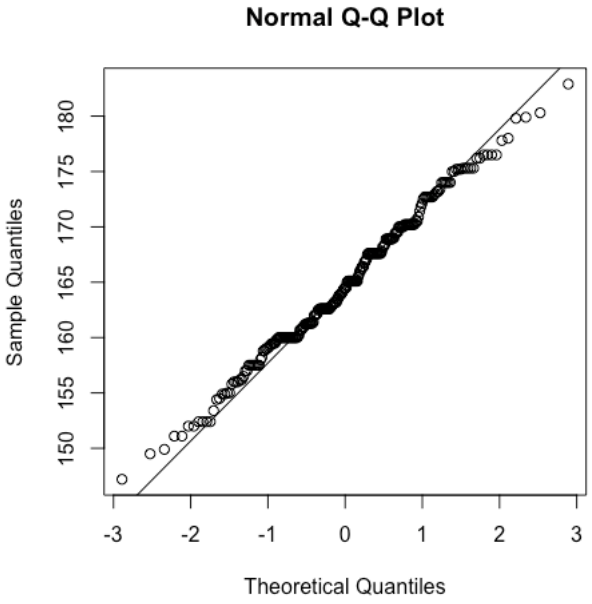


Figure 1. Exact Calculation

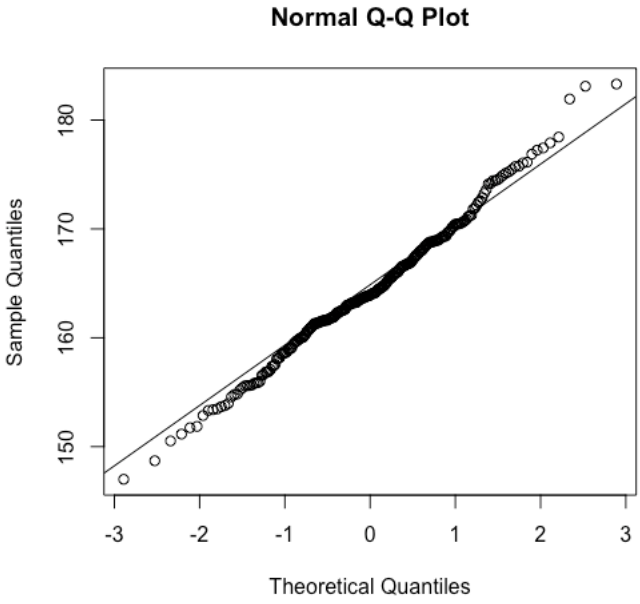
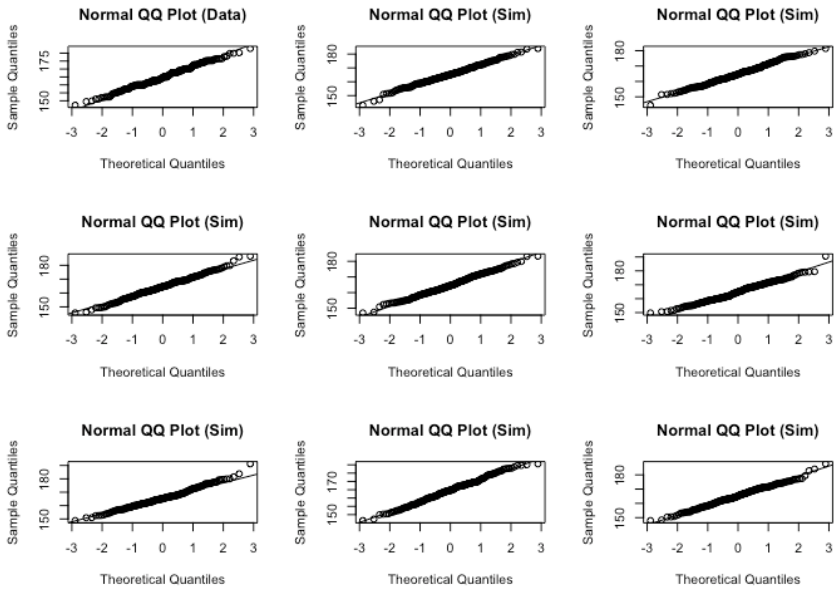


Figure 2. Simulation

Exercise 3

All points fall close to the line of best fit. Although, once the range exceeds -2 and 2, the values start to deviate from the line. The simulation and exact calculation graphs are very similar to each other.

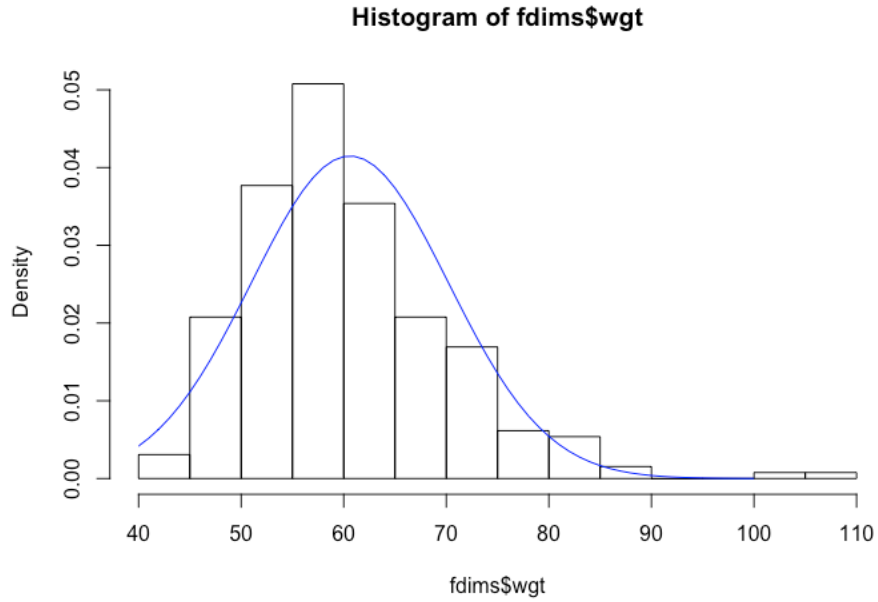


Exercise 4

The normal probability plot for fdims$hgt look identical to the simulated plots. The plots show that the female heights are normal.

Exercise 5

The histogram shows that female heights distribution is right-skewed. It seems that distribution would be normal if those values were removed.




```
> 1 - pnorm(q = 182, mean = fhgtmean, sd = fhgtsd)
[1] 0.004434387
> sum(fdims$hgt > 182)/length(fdims$hgt)
[1] 0.003846154
```

Figure 3. Theoretical Probabilities for female heights

Exercise 6

(a) The histogram for female bi-iliac diameter (bii.di) belongs to normal probability plot letter **_B__**
(b) The histogram for female elbow diameter (elb.di) belongs to normal probability plot letter **__C_**
(c) The histogram for general age (age) belongs to normal probability plot letter **_D__**
(d) The histogram for female chest depth (che.de) belongs to normal probability plot letter **__A_**

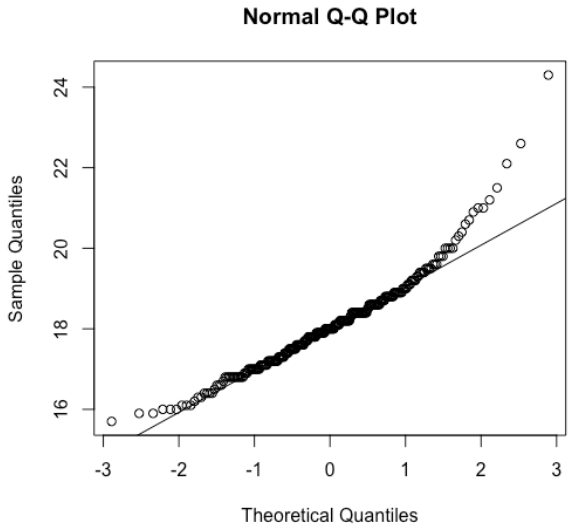
qqnorm(fdims$che.de)
qqline(fdims$che.de)
qqnorm(fdims$age)

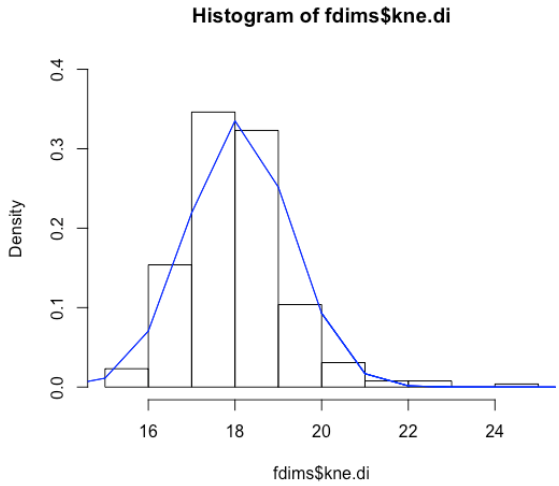
qqline(fdims$age)
qqnorm(fdims$bii.di)
qqline(fdims$bii.di)
qqnorm(fdims$elb.di)
qqline(fdims$elb.di)

Exercise 7

When the data was inputted, it could have been manipulated or rounded, swaying the result.

Exercise 8





The variable is fairly normal but slightly right-skewed. The points deviate as the values increase on the Normal Q-Q plot. The histogram shows that the variable is slightly right-skewed.

Assignment 2 Code

```r
#R assignment 2
download.file("http://www.openintro.org/stat/data/bdims.RData", destfile = "bdims.RData")
load("bdims.RData")
head(bdims)
mdims = subset(bdims, bdims$sex == 1)
fdims = subset(bdims, bdims$sex == 0)
fdims$hgt
mdims$hgt
hist(fdims$hgt)
hist(mdims$hgt)
fhgtmean = mean(fdims$hgt)
fhgtsd = sd(fdims$hgt)
hist(fdims$hgt, probability = TRUE , ylim = c(0, 0.06))
x = 140:190
y = dnorm(x = x, mean = fhgtmean, sd = fhgtsd)
lines(x = x, y = y, col = "blue")
qqnorm(fdims$hgt)
qqline(fdims$hgt)
sim = rnorm(n = length(fdims$hgt), mean = fhgtmean, sd = fhgtsd)
hist(sim)
qqnorm(sim)
qqline(sim)
qqnormsim(fdims$hgt)
1 - pnorm(q = 182, mean = fhgtmean, sd = fhgtsd)
sum(fdims$hgt > 182)/length(fdims$hgt)
fwgtmean = mean(fdims$wgt)
fwgtsd   = sd(fdims$wgt)
lines(x = x, y = y, col = "blue")
qqnorm(fdims$che.de)
qqline(fdims$che.de)
qqnorm(fdims$age)
qqline(fdims$age)
qqnorm(fdims$bii.di)
qqline(fdims$bii.di)
qqnorm(fdims$elb.di)
qqline(fdims$elb.di)

qqnorm(fdims$kne.di)
qqline(fdims$kne.di)
kne = rnorm(n = length(fdims$kne.di), mean = fhgtmean, sd = fhgtsd)
hist(kne)
hist(fdims$kne.di, probability = TRUE , ylim = c(0, 0.4))
fknedimean = mean(fdims$kne.di)
fkne.disd = sd(fdims$kne.di)
x = 10:20
y = dnorm(x = x, mean = fknedimean, sd = fkne.disd)
lines(x = x, y = y, col = "blue")
```