Intro to R HW

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Exercise 1 & 2

Importing the data from 'baseball.csv' as a data frame and checking for 'Factor' structures.

```
baseball <- read.csv("C:/Users/matth/Downloads/baseball.csv")

is.factor(baseball$bat)
```

```
## [1] FALSE
```

```
is.factor(baseball$throw)
```

```
## [1] FALSE
```

```
is.factor(baseball$field)
```

```
## [1] FALSE
```

Exercise 3

Create a subset of pitchers and calculate the mean standard deviation of the ERA.

```
pitchers <- subset(baseball, field == 0)

sd(pitchers$average)
```

```
## [1] 0.5950598
```

Exercise 4

Create a subset of fielders and calculate the mean standard deviation of the batting average.

```
fielders <- subset(baseball, field == 1)

sd(fielders$average)
```

```
## [1] 0.02352409
```

Exercise 5

Define BMI and add it to the data frame.

```
bmi <- (baseball$weight * 703) / baseball$height^2

baseball$bmi <- bmi
```

Exercise 6

Sort the values in increasing order by BMI.

```
baseball <- baseball[order(baseball$bmi, decreasing = FALSE),]

print(baseball)
```

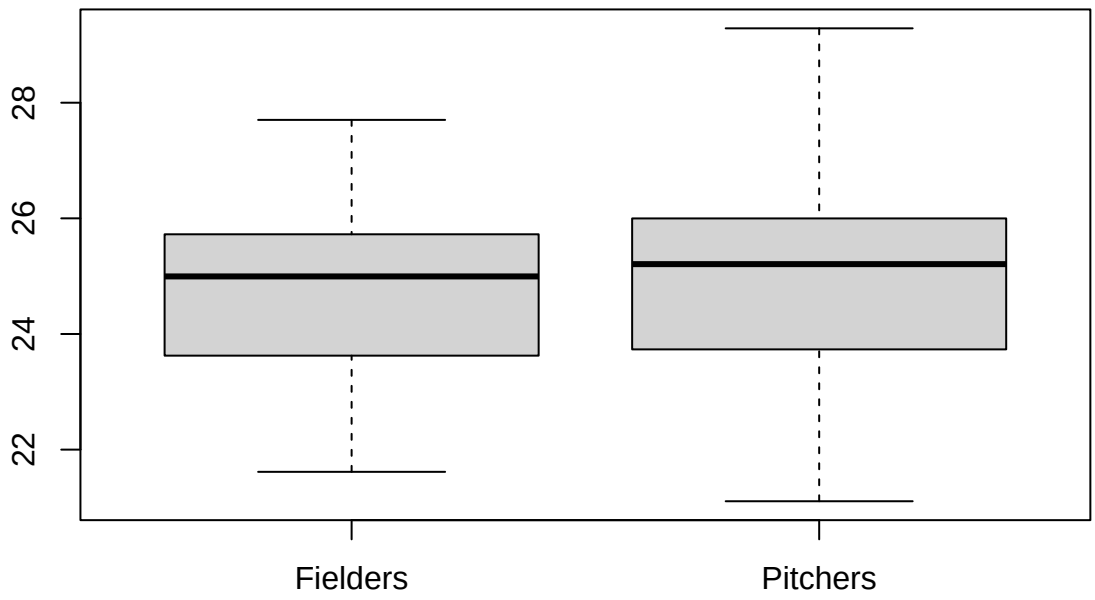
```
##     X height weight bat throw field average      bmi
## 53 53     73    160   R     R     0   4.760 21.10715
## 56 56     71    155   S     R     1   0.251 21.61575
## 54 54     74    170   L     L     1   0.271 21.82432
## 20 20     76    180   L     L     0   3.290 21.90789
## 59 59     70    155   S     R     1   0.261 22.23776
## 58 58     71    160   S     R     1   0.270 22.31303
## 55 55     76    185   R     R     0   2.840 22.51645
## 27 27     77    190   S     R     1   0.212 22.52825
## 45 45     73    175   R     L     0   4.650 23.08594
## 2   2     75    185   R     R     1   0.286 23.12089
## 11 11     76    190   R     R     0   3.750 23.12500
## 57 57     76    190   R     R     0   3.280 23.12500
## 51 51     71    166   R     R     1   0.274 23.14977
## 5   5     69    160   S     R     1   0.242 23.62529
## 25 25     69    160   R     R     1   0.225 23.62529
## 21 21     72    175   L     L     1   0.290 23.73167
## 22 22     76    195   L     L     0   4.990 23.73355
## 18 18     75    190   R     R     1   0.239 23.74578
## 39 39     74    185   R     R     1   0.286 23.75000
## 47 47     74    185   S     L     0   4.070 23.75000
## 19 19     76    200   R     R     0   3.380 24.34211
## 16 16     75    195   R     R     0   3.660 24.37067
## 4   4     73    185   R     R     1   0.271 24.40514
## 13 13     73    185   R     R     1   0.245 24.40514
## 24 24     73    185   R     R     1   0.271 24.40514
## 12 12     72    180   S     R     1   0.236 24.40972
## 8   8     76    205   R     R     0   3.420 24.95066
## 29 29     75    200   R     R     0   3.940 24.99556
## 33 33     75    200   L     R     0   3.180 24.99556
## 35 35     75    200   R     R     1   0.274 24.99556
## 15 15     74    195   R     R     1   0.276 25.03378
## 28 28     74    195   R     R     1   0.262 25.03378
## 46 46     73    190   L     L     1   0.238 25.06474
## 17 17     72    185   L     L     1   0.300 25.08777
```

```
## 34 34     70    175   L     R     1   0.279 25.10714
## 36 36     78    220   R     R     0   3.880 25.42078
## 42 42     76    210   L     L     0   3.280 25.55921
## 38 38     75    205   L     L     1   0.284 25.62044
## 44 44     75    205   R     R     0   3.700 25.62044
## 26 26     76    211   S     R     1   0.282 25.68092
## 37 37     73    195   R     R     0   4.570 25.72434
## 43 43     73    195   R     R     1   0.243 25.72434
## 32 32     72    190   R     R     1   0.238 25.76582
## 48 48     72    190   S     R     1   0.254 25.76582
## 40 40     71    185   S     R     1   0.218 25.79944
## 52 52     71    185   R     L     0   3.730 25.79944
## 3   3     77    219   L     L     0   3.040 25.96677
## 7   7     78    225   R     R     0   3.460 25.99852
## 10 10     78    225   R     R     0   3.460 25.99852
## 31 31     79    232   L     L     0   3.100 26.13299
## 14 14     73    200   L     L     0   4.800 26.38394
## 23 23     68    175   L     R     1   0.283 26.60575
## 50 50     71    195   R     R     1   0.244 27.19401
## 9   9     77    230   L     R     1   0.303 27.27104
## 30 30     73    207   S     R     1   0.251 27.30737
## 41 41     73    210   R     R     1   0.282 27.70313
## 49 49     73    210   R     R     0   3.290 27.70313
## 1   1     74    218   R     L     0   3.330 27.98649
## 6   6     73    222   R     R     0   3.920 29.28617
```

Exercise 7

Comparison boxplot of the BMI's of pitchers and fielders.

```
boxplot(subset(baseball, field == 1)$bmi, subset(baseball, field == 0)$bmi,
        names=c("Fielders", "Pitchers"))
```



Exercise 8

Mean/Standard Deviation of the heights, weights, and BMI's of fielders.

```
fielders <- subset(baseball, field == 1)

# --- Mean --- #

## Height
mean(fielders$height)
```

```
## [1] 72.66667
```

```
## Weight
mean(fielders$weight)
```

```
## [1] 185.4242
```

```
## BMI
mean(fielders$bmi)
```

```
## [1] 24.65618
```

```r
# --- Standard Deviation --- #

## Height
sd(fielders$height)
```

```
## [1] 2.217356
```

```r
## Weight
sd(fielders$weight)
```

```
## [1] 17.26635
```

```r
## BMI
sd(fielders$bmi)
```

```
## [1] 1.618991
```

Exercise 9

The difference between the avg. ERA of pitchers who's BMI is >= 25 and the avg. ERA of pitchers with BMI < 25, shown as absolute value.

```r
pitchers <- subset(baseball, field == 0)

abs(mean(subset(pitchers, bmi >= 25)$average) - mean(subset(pitchers, bmi < 25)$average))
```

```
## [1] 0.1269231
```

Exercise 10

Create a new data frame that contains overweight players based on BMI.

```r
owbb <- subset(baseball, bmi >= 25)

print(owbb)
```

```
##     X height weight bat throw field average      bmi
## 15 15     74    195   R     R     1   0.276 25.03378
## 28 28     74    195   R     R     1   0.262 25.03378
## 46 46     73    190   L     L     1   0.238 25.06474
## 17 17     72    185   L     L     1   0.300 25.08777
## 34 34     70    175   L     R     1   0.279 25.10714
## 36 36     78    220   R     R     0   3.880 25.42078
## 42 42     76    210   L     L     0   3.280 25.55921
## 38 38     75    205   L     L     1   0.284 25.62044
## 44 44     75    205   R     R     0   3.700 25.62044
## 26 26     76    211   S     R     1   0.282 25.68092
```

```
## 37 37     73    195   R     R     0   4.570 25.72434
## 43 43     73    195   R     R     1   0.243 25.72434
## 32 32     72    190   R     R     1   0.238 25.76582
## 48 48     72    190   S     R     1   0.254 25.76582
## 40 40     71    185   S     R     1   0.218 25.79944
## 52 52     71    185   R     L     0   3.730 25.79944
## 3   3     77    219   L     L     0   3.040 25.96677
## 7   7     78    225   R     R     0   3.460 25.99852
## 10 10     78    225   R     R     0   3.460 25.99852
## 31 31     79    232   L     L     0   3.100 26.13299
## 14 14     73    200   L     L     0   4.800 26.38394
## 23 23     68    175   L     R     1   0.283 26.60575
## 50 50     71    195   R     R     1   0.244 27.19401
## 9   9     77    230   L     R     1   0.303 27.27104
## 30 30     73    207   S     R     1   0.251 27.30737
## 41 41     73    210   R     R     1   0.282 27.70313
## 49 49     73    210   R     R     0   3.290 27.70313
## 1   1     74    218   R     L     0   3.330 27.98649
## 6   6     73    222   R     R     0   3.920 29.28617
```