## Formative Assessment 1

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1. Write the skewness program, and use it to calculate the skewness coefficient of the four examination subjects in results.txt (results.csv). What can you say about these data?

Pearson has given an approximate formula for the skewness that is easier to calculate than the exact formula given in Equation 2.1.

```
results <- read.csv("C:/Users/Dell/Downloads/FA1/results.csv", header = T)</pre>
results$gender <- as.factor(results$gender)</pre>
summary(results)
## gender arch1 prog1 arch2
                                                                                                    prog2
## f: 19 Min. : 3.00 Min. :12.00 Min. : 6.00 Min. : 5.00
## m:100 1st Qu.: 46.75 1st Qu.:40.00 1st Qu.:40.00 1st Qu.:30.00
## Median: 68.50 Median: 64.00 Median: 48.00 Median: 57.00

      Mean
      : 63.57
      Mean
      :59.02
      Mean
      :51.97
      Mean
      :53.78

      3rd Qu.: 83.25
      3rd Qu.: 78.00
      3rd Qu.: 61.00
      3rd Qu.: 76.50

      Max.
      :100.00
      Max.
      :98.00
      Max.
      :98.00
      Max.
      :97.00

      NA's
      :3
      NA's
      :2
      NA's
      :4
      NA's
      :8

##
##
##
```

SKEWNESS (first method) Using the skewness program from the book:

```
skew <- function(x) {</pre>
 xbar <- mean(x,na.rm = T)
  sum2 < - sum((x-xbar)^2, na.rm = T)
  sum3 <- sum((x-xbar)^3, na.rm = T)
  skew <- (\operatorname{sqrt}(\operatorname{length}(x))*\operatorname{sum3})/(\operatorname{sum2}(1.5))
  skew
}
skew(results$arch1)
## [1] -0.5195368
skew(results$prog1)
## [1] -0.3362643
skew(results$arch2)
## [1] 0.4558875
skew(results$prog2)
## [1] -0.3125144
## Skewness for Arch1: -0.5195368
## Skewness for Prog1: -0.3362643
## Skewness for Arch2: 0.4558875
## Skewness for Prog2: -0.3125144
```

```
SKEWNESS (second method) Using the Pearson's coefficient of skewness:
 skew2 <- function(x) {</pre>
   mn < - mean(x, na.rm = T)
   md <- median(x, na.rm = T)
   standev <- sd(x, na.rm = T)
   skewness <- (3*(mn-md))/standev</pre>
   skewness
 skew2(results$arch1)
 ## [1] -0.6069042
 skew2(results$prog1)
 ## [1] -0.643229
 skew2(results$arch2)
 ## [1] 0.5421286
 skew2(results$prog2)
```

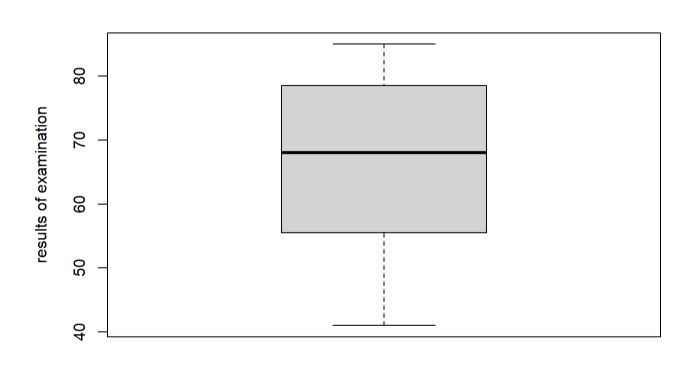
2. For the class of 50 students of computing detailed in Exercise 1.1, use R to

## [1] -0.3562908

a. form the stem-and-leaf display for each gender, and discuss the advantages of this representation compared to the traditional histogram;

Data: Females: 57, 59, 78, 79, 60, 65, 68, 71, 75, 48, 51, 55, 56, 41, 43, 44, 75, 78, 80, 81, 83, 83, 85 Males: 48, 49, 49, 30, 30, 31, 32, 35, 37, 41, 86, 42, 51, 53, 56, 42, 44, 50, 51, 65, 67, 51, 56, 58, 64, 64, 75

```
##
##
    The decimal point is 1 digit(s) to the right of the |
##
##
   4 | 1348
    5 | 15679
##
## 6 | 058
   7 | 155889
##
##
    8 | 01335
##
##
    The decimal point is 1 digit(s) to the right of the |
##
##
    3 | 001257
## 4 | 1224899
## 5 | 01113668
##
    6 | 4457
## 7 | 5
## 8 | 6
```



females

