

Moments, Skewness and Kurtosis

Introduction:

One measure each of dispersion, skewness or lack of symmetry and kurtosis or flatness/peakedness is defined in terms of what are known as moments. The property of a group of variates or a frequency distribution in which more number of variates or more frequencies lie on one side of the modal value than on the other is called skewness. The characteristic of flatness or peakedness of a frequency distribution and hence the frequency curve is called kurtosis.

Procedure:

1. Import data set
2. Determine the measures using suitable R functions

Note: Please make sure that the following package is already installed
“moments”

Code and Results:

```
# Create the vector with numbers.
data <- c(2, 1, 2, 3, 1, 2, 3, 4, 1, 5, 5, 3, 2, 3)
# Calculate the mean
mean(data)

## [1] 2.642857

# Calculate the median
median(data)

## [1] 2.5

#To get mode
# Create the function.
getmode <- function(data) {
  uniqv <- unique(data)
  uniqv[which.max(tabulate(match(data, uniqv)))]
}
# Calculate the mode using the user function.
result <- getmode(data)
print(result)

## [1] 2

# Create the vector with characters.
charv <- c("o", "it", "the", "it", "it")
# Calculate the mode using the user function.
result <- getmode(charv)
print(result)
```

```

## [1] "it"

#Moments, Skewness, Kurtosis
library(moments)
moment(data) # This gives the first moment

## [1] 2.642857

all.moments(data) # This takes the default order as

## [1] 1.000000 2.642857 8.642857

#2 and gives the zeroth, first and second moment
moment(data, order=3, absolute=TRUE)#gives the third moment

## [1] 32.64286

moment(data, order=4, absolute=TRUE)#gives the fourth moment

## [1] 135.5

all.moments(data, order.max = 4, central = FALSE, absolute = TRUE, na.rm =
FALSE) # all 4 moments together

## [1] 1.000000 2.642857 8.642857 32.642857 135.500000

all.moments(data, order.max = 4, central = TRUE, absolute = FALSE, na.rm =
FALSE) # gives the moment about mean

## [1] 1.000000e+00 6.344132e-17 1.658163e+00 1.036443e+00 6.266790e+00

kurtosis(data) #Kurtosis of the data

## [1] 2.279243

skewness(data) #Skewness of the data

## [1] 0.4854053

```