Experiment 1

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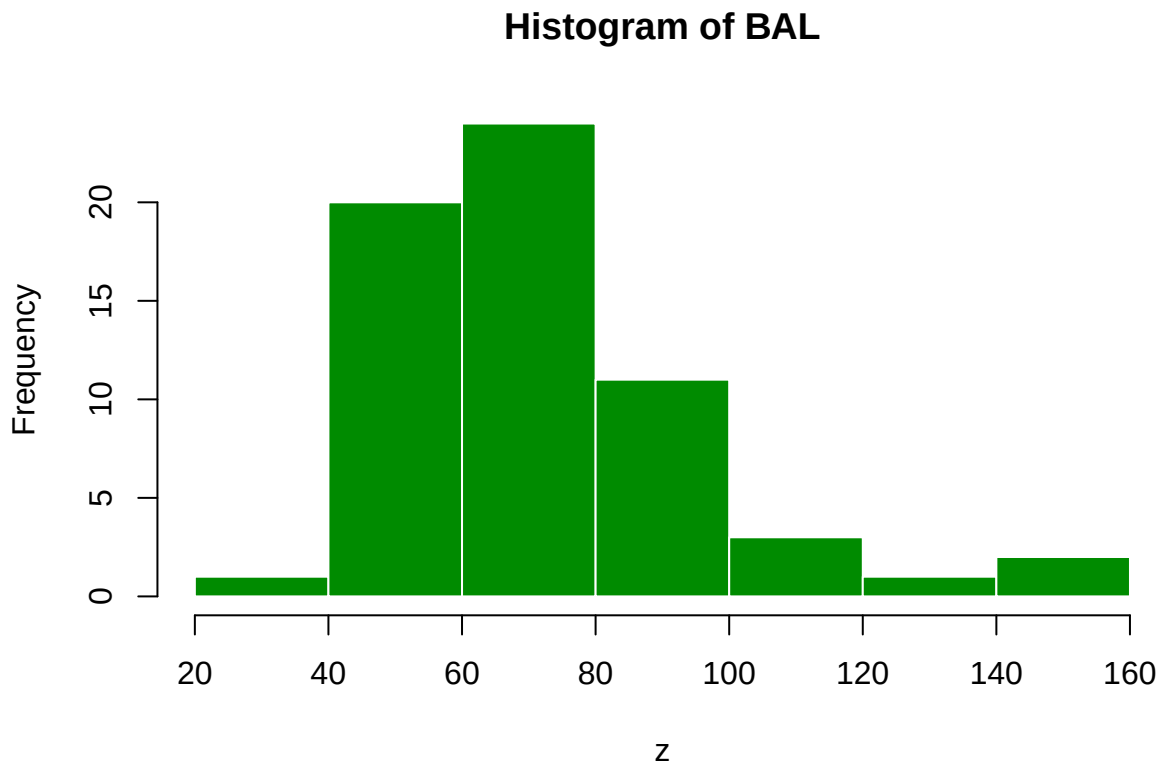
1(b) Aim: To construct histogram and Stem & leaf display of given data using R

Calculations:

```
z = c(76,57,74,100,73,77,88,77,51,62,149,86,57,72,
      67,54,54,91,62,44,66,55,95,71,73,57,51,114,61,
      42,78, 53,106,35,85,72,61,72,41,59,63,54,59,128
      ,67,83,95,88,109,79,58,82,153,84,62,70,44,61,55,
      69,59,50)
hist(z,main="Histogram of BAL", col = "green4", border = "white")
```



```
stem(z)
```

```
##
##   The decimal point is 1 digit(s) to the right of the |
##
##    2 | 5
##    4 | 12440113444557778999
##    6 | 111222367790122233467789
##    8 | 2345688155
##   10 | 0694
##   12 | 8
##   14 | 93
```

1(c) Aim: To Compute Mean, Median, Q1, Q3, Geometric Mean and Harmonic Mean for given data using R.

Calculations:

```
mean(z)
```

```
## [1] 72.41935
```

```
median(z)
```

```
## [1] 68
```

```
Q1 = quantile(z,0.25)
Q1
```

```
## 25%
##  57
```

```
Q3 = quantile(z,0.75)
Q3
```

```
##   75%
## 82.75
```

```
library(psych)
geometric.mean(z)
```

```
## [1] 69.20101
```

```
harmonic.mean(z)
```

```
## [1] 66.36748
```

2. Aim: To generate the given vector, store it in x and carry out computations.

Calculations:

```
x = c(1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 6, 12, 24, 15, 20)
x
```

```
##  [1]  1.0  1.5  2.0  2.5  3.0  3.5  4.0  4.5  5.0  6.0 12.0 24.0 15.0 20.0
```

```
mean(x)
```

(a) Mean, Median, Mode, Quartiles, Range, Standard deviation, Variance, Coefficient of variation

```
## [1] 7.428571
```

```
median(x)
```

```
## [1] 4.25
```

```
# Since every value occurs with single frequency,therefore mode doesn't exist
Q1 = quantile(x,0.25)
Q2 = quantile(x,0.50)
Q3 = quantile(x,0.75)
Q1
```

```
##   25%
## 2.625
```

```
Q2
```

```
##  50%
## 4.25
```

```
Q3
```

```
##  75%
## 10.5
```

```
(Range = max(x)-min(x))
```

```
## [1] 23
```

```
sd(x)
```

```
## [1] 7.361169
```

```
var(x)
```

```
## [1] 54.18681
```

```
(cv = sd(x)/mean(x)*100)
```

```
## [1] 99.09266
```

```
summary(x)
```

(b) Summary

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.000   2.625   4.250   7.429  10.500  24.000
```

```
sort(x)
```

(c) Sort ascending

```
##  [1]  1.0  1.5  2.0  2.5  3.0  3.5  4.0  4.5  5.0  6.0 12.0 15.0 20.0 24.0
```

```
sort(x,decreasing = T)
```

(d) Sort descending

```
##  [1] 24.0 20.0 15.0 12.0  6.0  5.0  4.5  4.0  3.5  3.0  2.5  2.0  1.5  1.0
```

```
order(x)
```

(e) Order an index and check whether this is same as x[order(x)].

```
##  [1]  1  2  3  4  5  6  7  8  9 10 11 13 14 12
```

```
x[order(x)]
```

```
##  [1]  1.0  1.5  2.0  2.5  3.0  3.5  4.0  4.5  5.0  6.0 12.0 15.0 20.0 24.0
```

Further computations

```
log(x)
```

(a) Aim: To compute log(x), log(x) to base 10, log(x) to base 2, 3+log(x), sum(x), sin(x), tan(x), gamma(x), lgamma(x)

```
##  [1] 0.0000000 0.4054651 0.6931472 0.9162907 1.0986123 1.2527630 1.3862944
##  [8] 1.5040774 1.6094379 1.7917595 2.4849066 3.1780538 2.7080502 2.9957323
```

```
log10(x)
```

```
##  [1] 0.0000000 0.1760913 0.3010300 0.3979400 0.4771213 0.5440680 0.6020600
##  [8] 0.6532125 0.6989700 0.7781513 1.0791812 1.3802112 1.1760913 1.3010300
```

```
log2(x)
```

```
##  [1] 0.0000000 0.5849625 1.0000000 1.3219281 1.5849625 1.8073549 2.0000000
##  [8] 2.1699250 2.3219281 2.5849625 3.5849625 4.5849625 3.9068906 4.3219281
```

```
3+log(x)
```

```
##  [1] 3.000000 3.405465 3.693147 3.916291 4.098612 4.252763 4.386294 4.504077
##  [9] 4.609438 4.791759 5.484907 6.178054 5.708050 5.995732
```

```
sum(x)
```

```
## [1] 104
```

```
sin(x)
```

```
##  [1]  0.8414710  0.9974950  0.9092974  0.5984721  0.1411200 -0.3507832
##  [7] -0.7568025 -0.9775301 -0.9589243 -0.2794155 -0.5365729 -0.9055784
## [13]  0.6502878  0.9129453
```

```
tan(x)
```

```
##  [1]  1.5574077 14.1014199 -2.1850399 -0.7470223 -0.1425465  0.3745856
##  [7]  1.1578213  4.6373321 -3.3805150 -0.2910062 -0.6358599 -2.1348967
## [13] -0.8559934  2.2371609
```

```
gamma(x)
```

```
##  [1] 1.000000e+00 8.862269e-01 1.000000e+00 1.329340e+00 2.000000e+00
##  [6] 3.323351e+00 6.000000e+00 1.163173e+01 2.400000e+01 1.200000e+02
## [11] 3.991680e+07 2.585202e+22 8.717829e+10 1.216451e+17
```

```
lgamma(x)
```

```
##  [1]  0.0000000 -0.1207822  0.0000000  0.2846829  0.6931472  1.2009736
##  [7]  1.7917595  2.4537366  3.1780538  4.7874917 17.5023078 51.6066756
## [13] 25.1912212 39.3398842
```

```
y = x^3
y
```

(b) Aim: To Compute x^3, store in y, extract second element, (2,4)th element and elements from 2 to 7

```
##  [1]     1.000     3.375     8.000    15.625    27.000    42.875    64.000
```

```
##  [8]    91.125   125.000   216.000  1728.000 13824.000  3375.000  8000.000
```

```
y[2]
```

```
## [1] 3.375
```

```
y[c(2,4)]
```

```
## [1]  3.375 15.625
```

```
y[2:7]
```

```
## [1]  3.375  8.000 15.625 27.000 42.875 64.000
```

```
marks = c(45,65,55,98,76)
marks
```

(c) Aim: To Generate a vector with marks of 5 students and then draw a Bar diagram

```
## [1] 45 65 55 98 76
```

```
names(marks) = c("A","B","C","D","E")
barplot(marks, col="purple", border="black")
```