Descriptive Statistics

(a) Compute Mean, Median, Quartiles, Percentile (use quantile() function), Variance, Standard Deviation, IQR, Minimum & Maximum Values, Summary Statistics and interpretation (Mandatory)

#create a table by using vector
x = c(27, 25, 20, 15, 30, 34, 28, 25)   #create a vector
table = data.frame(x)
table   #diplay the data in table format
output:-   x
      1 27
      2 25
      3 20
      4 15
      5 30
      6 34
      7 28
      8 25

#find length of insert/input data
length(x)
output:- 8

#Arrange the given data in ascending order (sorting)
sort(x)
output:- 15 20 25 25 27 28 30 34

#find the mean
mean(x)
output:- 25.5

#find the median
median(x)
output:- 26

#find the Mean Absolute Deviation(MAD)
mad(x)
output:- 4.4478

#find maximum value
max(x)
output:- 34

#find minimum value
min(x)
output:- 15

#find the quartile (Use quantile function)
quantile(x)
output:-   0%   25%   50%   75%   100%
        15.00 23.75 26.00 28.50 34.00

#find 30th, 55th, 85th percentile (p^{th}) value
quantile(x,c(0.30, 0.55, 0.85))
output:- 30% 55% 85%
        25.0 26.7 29.9

#find the range (Take difference between max(x)-min(x) function)
range = max(x) − min(x)
range
output:- 19

#find IQR (Inter Quartile Range = $Q_3 − Q_1$)
IQR(x)
output:- 4.75

#find the Coefficient of Variation (CV)
cv = sd(x)/mean(x)*100
cv
output:- 23.05783

#find the variance
var(x)
output:- 34.57143

#find the standard deviation
sd(x)
output:- 5.879747

#find five number summary (compare this function with:- **summary(x)** and *see the difference*)
fivenum(x)
output:- 15.0 22.5 26.0 29.0 34.0

#draw a boxplot for the given data.
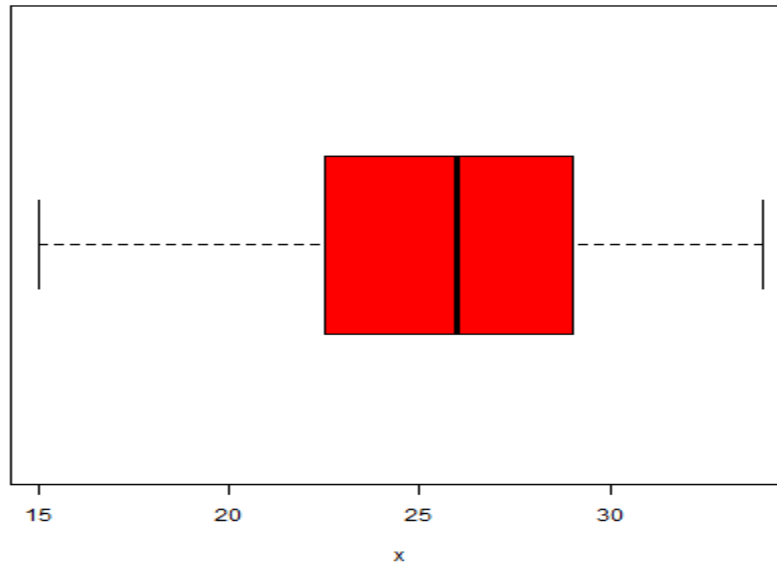**png(file = "boxplot.png")**   #create an image of boxplot
boxplot(x, xlab="x", main="Boxplot", horizontal = TRUE, col=c("red")) #use the function of boxplot
dev.off()   #save the file
output:-

Boxplot

#construct a stem & leaf display for the given data.
stem(x)

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output:- The decimal point is 1 digit(s) to the right of the |
            1 | 5
            2 | 0
            2 | 5578
            3 | 04
```

#find the skewness (S_k) and kurtosis
install.packages("e1071")   #install e1071 package
library(e1071)   #load e1071
skewness(x)
kurtosis(x)

(d) Compute Correlation of Coefficient(r) and Covariance (S_{xy}). (Mandatory)

#create a table by using vector
x = c(4, 6, 11, 3, 16)   #create a vector
y = c(50, 50, 40, 60, 30)   #create a vector
table = data.frame(x,y)
table   #diplay the data in table format

output:-

```
   x  y
1  4 50
2  6 50
3 11 40
4  3 60
5 16 30
```

#find the correlation of coefficient (r)
cor(x,y)
output:- −0.9688768

#find the covariance(S_{xy}):- $S_{xy} = \frac{\Sigma(x_i - \bar{x})(y_i - \bar{y})}{n - 1}$

cov(x,y)
output:- −60

dev.off()   #save the file