EXPERIMENT 2

- Import dataset or create a data vector
- Compute and provide outputs for
    - Mean and median
    - First four moments about the origin using built-in function
    - First four moments about the mean using built-in function
    - First four moments about an arbitrary origin using formulae
    - Range and mean deviation
    - Variance, standard deviation, skewness and kurtosis using built-in functions
    - Variance, standard deviation, skewness and kurtosis using formulae

CODE AND OUTPUTS:

DATA VECTOR:

```
x=c(54,98,59,14,10,46,79)
> x
[1] 54 98 59 14 10 46 79
```

MEAN:

```
mean(x)
51.42857
```

MEDIAN:

```
median(x)
54
```

FIRST FIVE MOMENTS ABOUT ORIGIN:

```
moment(x,order = 1,central = FALSE)
[1] 51.42857
> moment(x,order = 2,central = FALSE)
[1] 3522
> moment(x,order = 3,central = FALSE)
[1] 271164.9
> moment(x,order = 4,central = FALSE)
[1] 22333312
> moment(x,order = 5,central = FALSE)
[1] 1928136356
```

FIRST FIVE MOMENTS ABOUT MEAN:

moment(x,order = 1,central = TRUE)
[1] -2.030122e-15
> moment(x,order = 2,central = TRUE)
[1] 877.102
> moment(x,order = 3,central = TRUE)
[1] -182.7813
> moment(x,order = 4,central = TRUE)
[1] 1456355
> moment(x,order = 5,central = TRUE)
[1] 5648184

FIRST FOUR MOMENTS ABOUT ARBITARY ORIGIN:

sum(x-12)/length(x)
[1] 39.42857
> sum((x-12)^2)/length(x)
[1] 2431.714
> sum((x-12)^3)/length(x)
[1] 164862
> sum((x-12)^4)/length(x)
[1] 12025669
> sum((x-12)^5)/length(x)
[1] 92283813

RANGE:
range(x)
[1] 10 98

MEAN DEVIATION:
sum(x-mean(x))/length(x)
-2.030122e-15

VARIENCE:
var(x)
1023.286

STANDARD DEVIATION:
sd(x)
[1] 31.98884

SKEWNESS:
> skewness(x)
[1] -0.0070365

KURTOSIS:

kurtosis(x)

[1] 1.893072

VARIENCE USING FORMULA:

sum((x-mean(x))^2)/(length(x)-1)

[1] 1023.286

STANDARD DEVIATION USING FORMULA:

sqrt(sum((x-mean(x))^2)/(length(x)-1))

[1] 31.98884

SKEWNESS USING FORMULA:

3*(mean(x)-median(x))/sqrt(sum((x-mean(x))^2)/(length(x)-1))

[1] -0.2411556

KURTOSIS USING FORMULA:

moment(x,4)/(moment(x,2)^2)

[1] 1.800423