AIM:- To utilize R's visualisation capabilities for the graphical representation of measure of dispersion, including Range, quartile deviation Standared deviation and variance in a given dataset.

Software Requirements:-

1. R environment installation
2. R Studio installation.

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Introduction :-

Measures of dispersion provide insights into the spread or variability of a dataset.

In this practical we will leverage R's powerful visualization capabilities to graphically represents measures of dispersion including the range, quartile deviation, standard deviation and variance.

Visualizations enhance our understanding of the spread of data and facilitate comparision between different datasets.

Objectives :-

- Calculate measures of dispersion using R function
- Utilise R's visualization tool to graphically represent the range quartile deviation, standard deviation and variance.
- Interpret and analyze the visualization to gain insites into the spread of the dataset.

Boxplot - Range

Max: 89

Boxplot - Quartiles

Q3: 64.25

Q1: 25.75

Histogram - Standard Deviation

Frequency

data

Boxplot - Variance
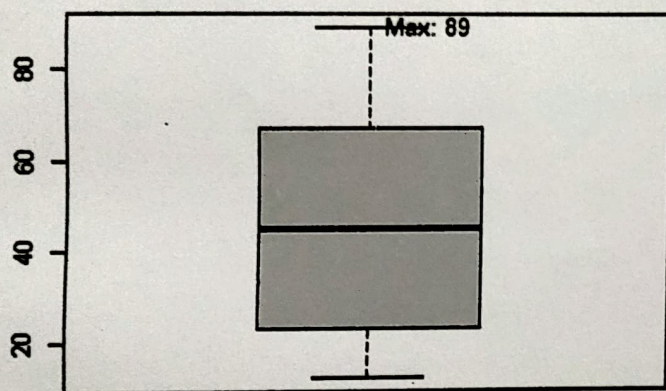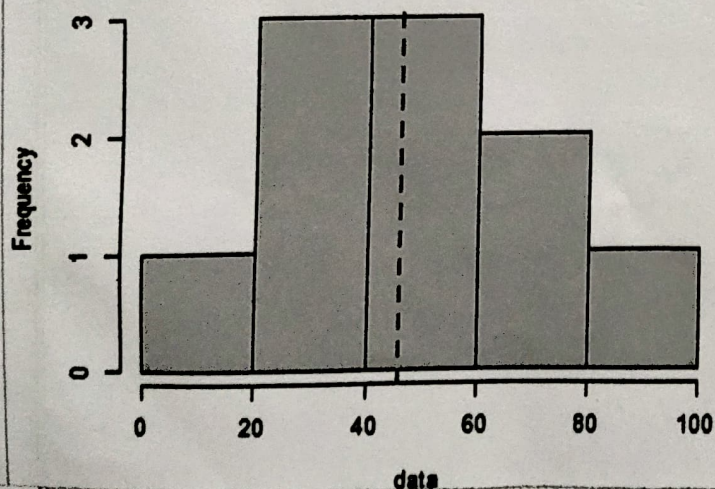
Procedure :-

Step 1 :- Load the dataset.

data ← c (23, 45, 67, 12, 89, 45, 23, 67, 343 56)

Step 2 :- Calculate Measures of Dispersion

– Use the R's function to compute range, quartile deviation, Standard deviation, and variance.

range_value ← range (data)

qdev_value ← IQR (data)/2

sd_value ← sd (data)

variance_value ← var(data)

Step 3 :- Visualize the measure of dispersion.

boxplot (data, main = "Boxplot of Range", ylab = "value")

hist (data, main = "Histogram of Data", xlab = "value", col = "lightblue")

plot (density (data), main = "Density Plot", xlab = "value", col = "darkblue")

plot (data, main = "scatterplot of data", xlab = "index", ylab = "value", col = "blue", pch = 16)

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Data plotting using Boxplot and Histogram

```
par (mfrow = c(2,2))


boxplot (data, main = "Boxplot Range", col = "lightblue")
text ( 1, range-value [2], paste ("max:" round.(range-value[2], 2)), pos = 4)
text (1, max(data)+5, paste ("Range:", round (diff (range-value), 2)), col="red")


boxplot (data, main = "Boxplot Quartile", col = "lightgreen")
text(1, quartiles [4], paste ("Q₃" round (quartile[4], 2)), pos = 4)
text (1, quartile [2], paste ("Q₁" round (quartile[2], 2), pos = 4]
qdev-value <- (quartile[4] - quartile[2]) /2
text (1, max (data)+10, paste ("quartile Deviation", round (qdev-value, 2)), col="blue")


hist (data, main = "Histogram - standard deviation", col = "pink"
abline (v = mean (data), col = "red", lty = 2 lwd = 2)
text (15, 12, paste ("mean", round (mean (data), 2)), col = "red")
text (1, max (data)+15, paste (" standard deviation", round (std-value, 2),
      col = "green" )


boxplot (data, main = "Boxplot Variance", col = "lightyellow")
text (1, variance-value, paste ("variance", round (variance-value, 2)), pos = 4
text (1, max (data) +20, paste ("variance", round (variance-value, 2)), col = "purple")
```

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