EXPERIMENT - 1

Aim :- Apply R to calculate and visualize measures of central tendency. (Arithmetic Mean, Median, Mode) for a given dataset.

Introduction :- Measures of central tendency, including the arithmetic mean, median, and mode, provide essential insights into the central or typical values within a dataset. In this practical, we will use R to calculate and visualize these measures for a given dataset. Understanding and applying these measures are fundamental skills in statistical analysis and data exploration.

Objective :- The main objectives of this practical are :-
1. Calculate the arithmetic mean, median and mode for a given dataset.
2. Utilize R functions to perform central tendency calculations.
3. Create visual visualizations to illustrate the distribution & central tendency measures.

Materials :- R studio or R environment installed.

Procedure :-
- **Step 1 :-** Load the Dataset
  Load the dataset or create a vector containing the data you want to analyze.

- **Step 2 :-** Calculate Measures of Central Tendency.
  Use R functions to compute the arithmetic mean, median and mode.

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Aim :- Apply R to calculate and visualize measures of central tendency (Arithmetic Mean, Median, Mode) for a given dataset.

Output :-

```r
# Function to calculate mode
calculate_mode <- function(x) {
  table_x <- table(x)
  mode_values <- as.numeric(names(table_x[table_x == max(table_x)]))
  return(mode_values)
}

# Declare a vector
my_vector <- c(10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 100)

# Find the mean
mean_value <- mean(my_vector)
cat("Mean:", mean_value, "\n")

# Find the median
median_value <- median(my_vector)
cat("Median:", median_value, "\n")

# Find the mode
mode_values <- calculate_mode(my_vector)
cat("Mode:", mode_values, "\n")
```

Console output:

```
> # Function to calculate mode
> calculate_mode <- function(x) {
+   table_x <- table(x)
+   mode_values <- as.numeric(names(table_x[table_x == max(table_x)]))
+   return(mode_values)
+ }
>
> # Declare a vector
> my_vector <- c(10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 100)
> # Find the mean
> mean_value <- mean(my_vector)
> cat("Mean:", mean_value, "\n")
Mean: 59.09091
> # Find the median
> median_value <- median(my_vector)
> cat("Median:", median_value, "\n")
Median: 60
> # Find the mode
> mode_values <- calculate_mode(my_vector)
> cat("Mode:", mode_values, "\n")
Mode: 100
>
```

Environment (Values):

Name	Value
mean_value	59.0909090909091
median_value	60
mode_values	100
my_vector	num [1:11] 10 20 30 40 50 60 70 80 90 100 ...

Functions:

calculate_mode	function (x)

Step 3 :- Visualize the Data and Measures
    Create visualizations to better understand the dataset and illustrate the central tendency measures.

Step 4 :- Interpretation
    Interpret the central tendency measures or transformations based on the characteristics of the dataset. For instance, consider calculating the standard deviation for a more comprehensive understanding of variability.

Code :-

```
calculate_mode <- function(x) {
    table_x <- table(x)
    mode_values <- as.numeric(names(table_x[table_x == max(table_x)]))
    return(mode_values)
}

my_vector <- c(10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 100)
mean_value <- mean(my_vector)
cat("Mean :", mean_value, "\n")
median_value <- median(my_vector)
cat("Median :", median_value, "\n")
mode_values <- calculate_mode(my_vector)
cat("Mode :", mode_values, "\n")
```

Conclusion :- Summarize the insights gained from calculating & visualizing measures of central tendency. Emphasize the importance of these measures in understanding the distribution and typical values within a dataset. This practical exercise provides a hands-on experiment in applying R for statistical analysis, enhancing your skills in exploring & summarizing data.

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