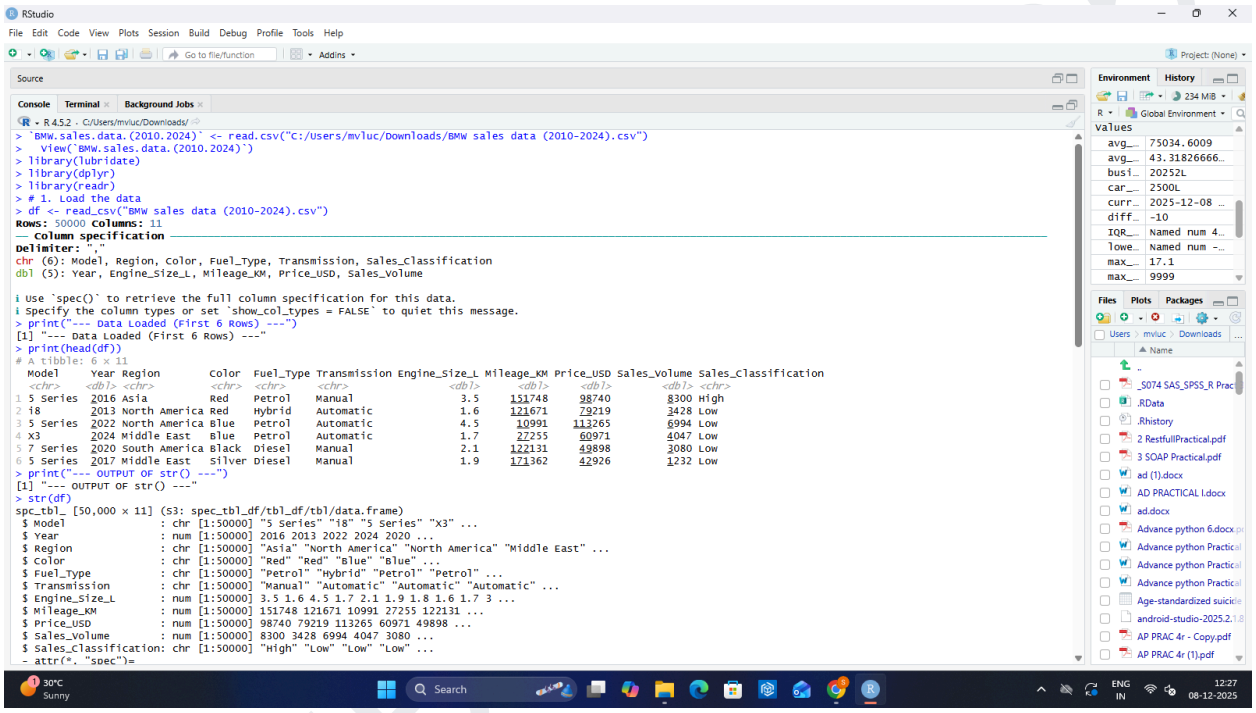
SHETH L.U.J. AND SIR M.V. COLLEGE OF ARTS SCIENCE AND COMMERCE

SUBJECT : R Programming

Practical No 15

Aim : Generating basic summaries using str() or summary() (R)..

Output :



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ROLL NO : S085

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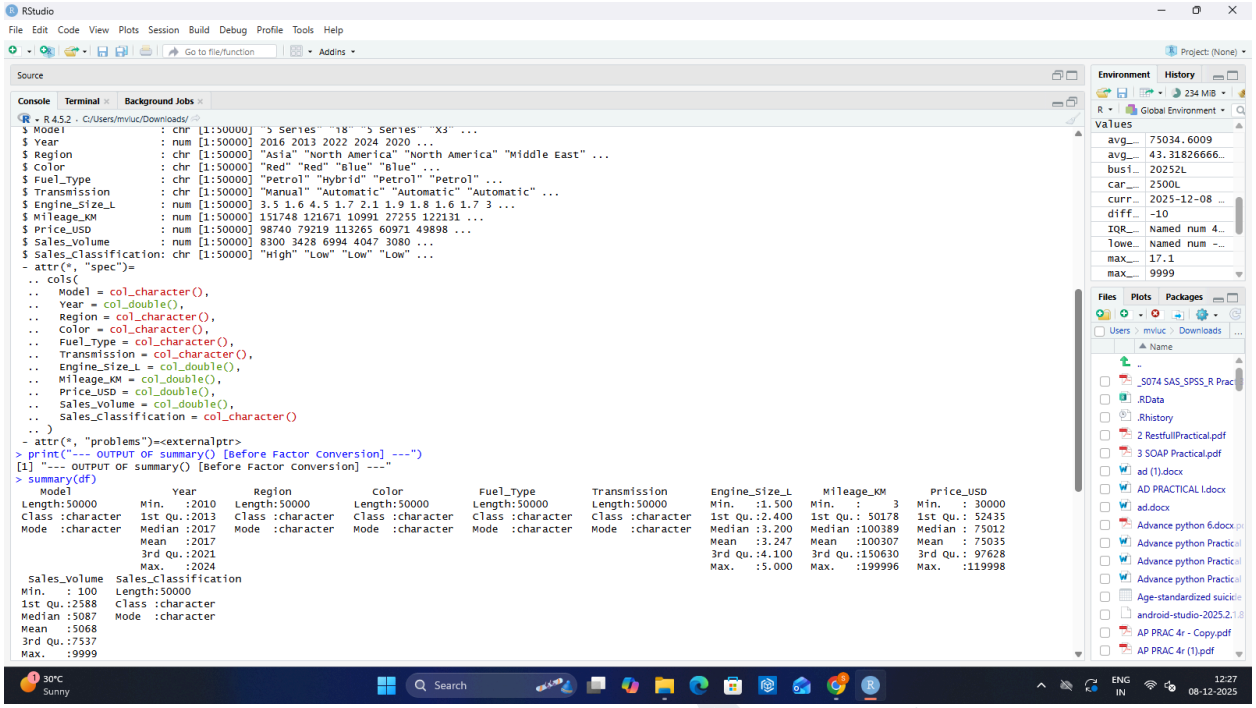
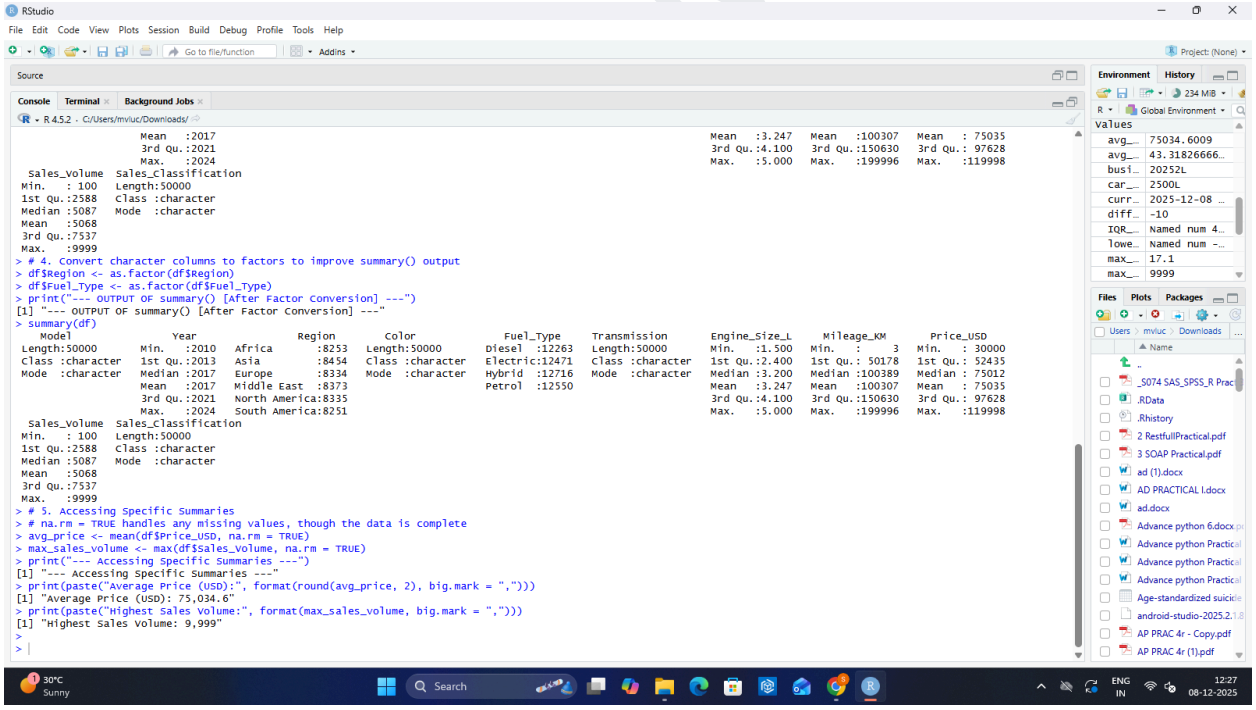
SUBJECT : R Programming



```
$ Model              : chr [1:50000] "5 Series" "i8" "5 Series" "X3" ...
$ Year               : num [1:50000] 2016 2013 2022 2024 2020 ...
$ Region             : chr [1:50000] "Asia" "North America" "North America" "Middle East" ...
$ Color              : chr [1:50000] "Red" "Red" "Blue" "Blue" ...
$ Fuel_Type          : chr [1:50000] "Petrol" "Hybrid" "Petrol" "Petrol" ...
$ Transmission       : chr [1:50000] "Manual" "Automatic" "Automatic" "Automatic" ...
$ Engine_Size_L      : num [1:50000] 3.5 1.6 4.5 1.7 2.1 1.9 1.8 1.6 1.7 3 ...
$ Mileage_KM         : num [1:50000] 151748 121671 10991 27255 122131 ...
$ Price_USD          : num [1:50000] 98740 79219 113265 60971 49898 ...
$ Sales_Volume       : num [1:50000] 8300 3428 6994 4047 3080 ...
$ Sales_Classification: chr [1:50000] "High" "Low" "Low" "Low" ...
- attr(*, "spec")=
 .. cols(
 ..   Model = col_character(),
 ..   Year = col_double(),
 ..   Region = col_character(),
 ..   Color = col_character(),
 ..   Fuel_Type = col_character(),
 ..   Transmission = col_character(),
 ..   Engine_Size_L = col_double(),
 ..   Mileage_KM = col_double(),
 ..   Price_USD = col_double(),
 ..   Sales_Volume = col_double(),
 ..   Sales_Classification = col_character()
 .. )
 - attr(*, "problems")=<externalptr>
> print("--- OUTPUT OF summary() [Before Factor Conversion] ---")
[1] "--- OUTPUT OF summary() [Before Factor Conversion] ---"
> summary(df)
    Model                Year         Region             Color            Fuel_Type         Transmission       Engine_Size_L    Mileage_KM       Price_USD
 Length:50000       Min.   :2010   Length:50000       Length:50000       Length:50000       Length:50000       Min.   :1.500   Min.   :     3   Min.   : 30000
 Class :character   1st Qu.:2013   Class :character   Class :character   Class :character   Class :character   1st Qu.:2.400   1st Qu.: 50178   1st Qu.: 52435
 Mode  :character   Median :2017   Mode  :character   Mode  :character   Mode  :character   Mode  :character   Median :3.200   Median :100389   Median : 75012
                    Mean   :2017                                                                             Mean   :3.247   Mean   :100307   Mean   : 75035
                    3rd Qu.:2021                                                                             3rd Qu.:4.100   3rd Qu.:150630   3rd Qu.: 97628
                    Max.   :2024                                                                             Max.   :5.000   Max.   :199996   Max.   :119998
  Sales_Volume   Sales_Classification
 Min.   : 100   Length:50000
 1st Qu.:2588   Class :character
 Median :5087   Mode  :character
 Mean   :5068
 3rd Qu.:7537
 Max.   :9999
```



```
                    Mean   :2017                                                                             Mean   :3.247   Mean   :100307   Mean   : 75035
                    3rd Qu.:2021                                                                             3rd Qu.:4.100   3rd Qu.:150630   3rd Qu.: 97628
                    Max.   :2024                                                                             Max.   :5.000   Max.   :199996   Max.   :119998
  Sales_Volume   Sales_Classification
 Min.   : 100   Length:50000
 1st Qu.:2588   Class :character
 Median :5087   Mode  :character
 Mean   :5068
 3rd Qu.:7537
 Max.   :9999
> # 4. Convert character columns to factors to improve summary() output
> df$Region <- as.factor(df$Region)
> df$Fuel_Type <- as.factor(df$Fuel_Type)
> print("--- OUTPUT OF summary() [After Factor Conversion] ---")
[1] "--- OUTPUT OF summary() [After Factor Conversion] ---"
> summary(df)
    Model                Year             Region       Color              Fuel_Type     Transmission       Engine_Size_L    Mileage_KM       Price_USD
 Length:50000       Min.   :2010   Africa       :8253   Length:50000       Diesel  :12263   Length:50000       Min.   :1.500   Min.   :     3   Min.   : 30000
 Class :character   1st Qu.:2013   Asia         :8454   Class :character   Electric:12471   Class :character   1st Qu.:2.400   1st Qu.: 50178   1st Qu.: 52435
 Mode  :character   Median :2017   Europe       :8334   Mode  :character   Hybrid  :12716   Mode  :character   Median :3.200   Median :100389   Median : 75012
                    Mean   :2017   Middle East  :8373                      Petrol  :12550                      Mean   :3.247   Mean   :100307   Mean   : 75035
                    3rd Qu.:2021   North America:8335                                                          3rd Qu.:4.100   3rd Qu.:150630   3rd Qu.: 97628
                    Max.   :2024   South America:8251                                                          Max.   :5.000   Max.   :199996   Max.   :119998
  Sales_Volume   Sales_Classification
 Min.   : 100   Length:50000
 1st Qu.:2588   Class :character
 Median :5087   Mode  :character
 Mean   :5068
 3rd Qu.:7537
 Max.   :9999
> # 5. Accessing Specific Summaries
> # na.rm = TRUE handles any missing values, though the data is complete
> avg_price <- mean(df$Price_USD, na.rm = TRUE)
> max_sales_volume <- max(df$Sales_Volume, na.rm = TRUE)
> print("--- Accessing Specific Summaries ---")
[1] "--- Accessing Specific Summaries ---"
> print(paste("Average Price (USD):", format(round(avg_price, 2), big.mark = ",")))
[1] "Average Price (USD): 75,034.6"
> print(paste("Highest Sales Volume:", format(max_sales_volume, big.mark = ",")))
[1] "Highest Sales Volume: 9,999"
>
>
```

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