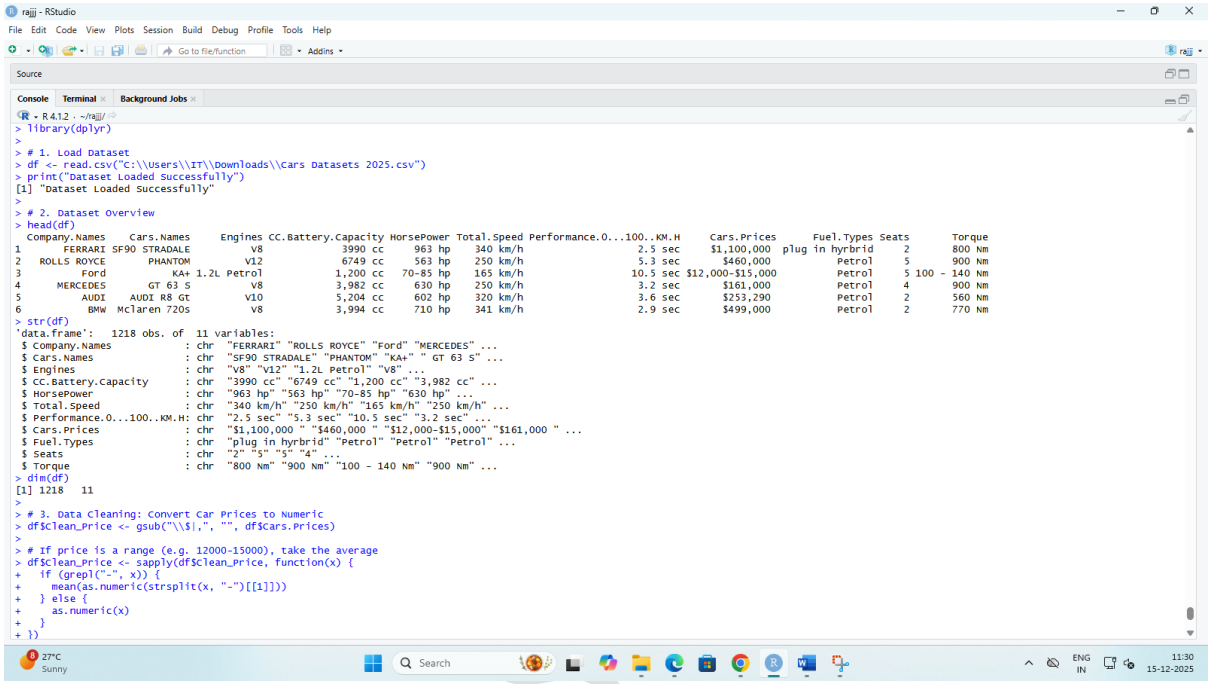
SHETH L.U.J AND SIR M.V. COLLEGE

SUBJECT :- DATA ANALYSIS WITH SAS/SPSS/R

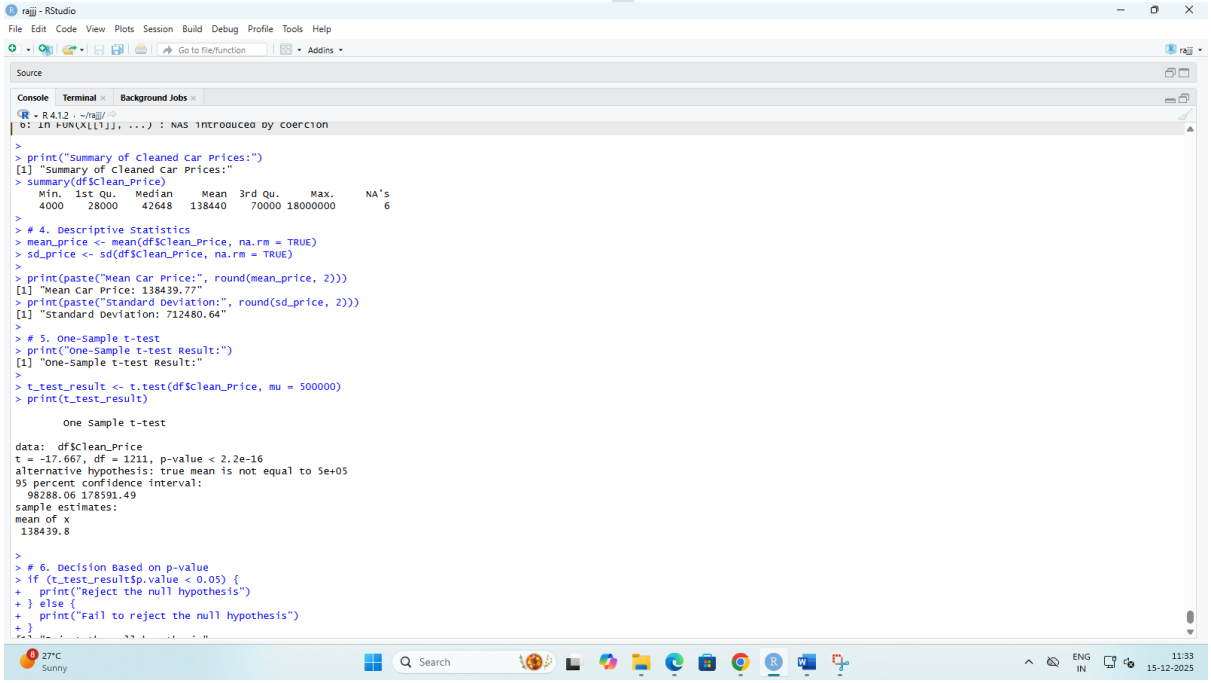
MODULE 2 - PRACTICAL – 4

AIM:- Performing one-sample t-tests using t.test() (R)

OUTPUT:-



```
> library(dplyr)
>
> # 1. Load Dataset
> df <- read.csv("C:\\Users\\IT\\Downloads\\Cars Datasets 2025.csv")
> print("Dataset Loaded Successfully")
[1] "Dataset Loaded Successfully"
>
> # 2. Dataset Overview
> head(df)
  Company.Names    Cars.Names     Engines CC.Battery.Capacity HorsePower Total.Speed Performance.0...100..KM.H     Cars.Prices      Fuel.Types Seats       Torque
1       FERRARI SF90 STRADALE          V8             3990 cc     963 hp    340 km/h                   2.5 sec     $1,100,000  plug in hyrbrid     2       800 Nm
2   ROLLS ROYCE       PHANTOM         V12             6749 cc     563 hp    250 km/h                   5.3 sec       $460,000           Petrol     5       900 Nm
3          Ford            KA+ 1.2L Petrol           1,200 cc   70-85 hp    165 km/h                  10.5 sec $12,000-$15,000           Petrol     5 100 - 140 Nm
4      MERCEDES      GT 63 S          V8             3,982 cc     630 hp    250 km/h                   3.2 sec       $161,000           Petrol     4       900 Nm
5          AUDI    AUDI R8 Gt         V10             5,204 cc     602 hp    320 km/h                   3.6 sec       $253,290           Petrol     2       560 Nm
6           BMW  Mclaren 720s          V8             3,994 cc     710 hp    341 km/h                   2.9 sec       $499,000           Petrol     2       770 Nm
> str(df)
'data.frame':   1218 obs. of  11 variables:
 $ Company.Names            : chr  "FERRARI" "ROLLS ROYCE" "Ford" "MERCEDES" ...
 $ Cars.Names               : chr  "SF90 STRADALE" "PHANTOM" "KA+" " GT 63 S" ...
 $ Engines                  : chr  "V8" "V12" "1.2L Petrol" "V8" ...
 $ CC.Battery.Capacity      : chr  "3990 cc" "6749 cc" "1,200 cc" "3,982 cc" ...
 $ HorsePower               : chr  "963 hp" "563 hp" "70-85 hp" "630 hp" ...
 $ Total.Speed              : chr  "340 km/h" "250 km/h" "165 km/h" "250 km/h" ...
 $ Performance.0...100..KM.H: chr  "2.5 sec" "5.3 sec" "10.5 sec" "3.2 sec" ...
 $ Cars.Prices              : chr  "$1,100,000 " "$460,000 " "$12,000-$15,000" "$161,000 " ...
 $ Fuel.Types               : chr  "plug in hyrbrid" "Petrol" "Petrol" "Petrol" ...
 $ Seats                    : chr  "2" "5" "5" "4" ...
 $ Torque                   : chr  "800 Nm" "900 Nm" "100 - 140 Nm" "900 Nm" ...
> dim(df)
[1] 1218   11
>
> # 3. Data Cleaning: Convert Car Prices to Numeric
> df$Clean_Price <- gsub("\\$|,", "", df$Cars.Prices)
>
> # If price is a range (e.g. 12000-15000), take the average
> df$Clean_Price <- sapply(df$Clean_Price, function(x) {
+   if (grepl("-", x)) {
+     mean(as.numeric(strsplit(x, "-")[[1]]))
+   } else {
+     as.numeric(x)
+   }
+ })
```



```
6: In FUN(X[[i]], ...) : NAs introduced by coercion
>
> print("Summary of Cleaned Car Prices:")
[1] "Summary of Cleaned Car Prices:"
> summary(df$Clean_Price)
    Min.  1st Qu.   Median     Mean  3rd Qu.     Max.     NA's
    4000    28000    42648   138440    70000 18000000        6
>
> # 4. Descriptive Statistics
> mean_price <- mean(df$Clean_Price, na.rm = TRUE)
> sd_price <- sd(df$Clean_Price, na.rm = TRUE)
>
> print(paste("Mean Car Price:", round(mean_price, 2)))
[1] "Mean Car Price: 138439.77"
> print(paste("Standard Deviation:", round(sd_price, 2)))
[1] "Standard Deviation: 712480.64"
>
> # 5. One-Sample t-test
> print("One-Sample t-test Result:")
[1] "One-Sample t-test Result:"
>
> t_test_result <- t.test(df$Clean_Price, mu = 500000)
> print(t_test_result)

        One Sample t-test

data:  df$Clean_Price
t = -17.667, df = 1211, p-value < 2.2e-16
alternative hypothesis: true mean is not equal to 5e+05
95 percent confidence interval:
  98288.06 178591.49
sample estimates:
mean of x
 138439.8

>
> # 6. Decision Based on p-value
> if (t_test_result$p.value < 0.05) {
+   print("Reject the null hypothesis")
+ } else {
+   print("Fail to reject the null hypothesis")
+ }
```

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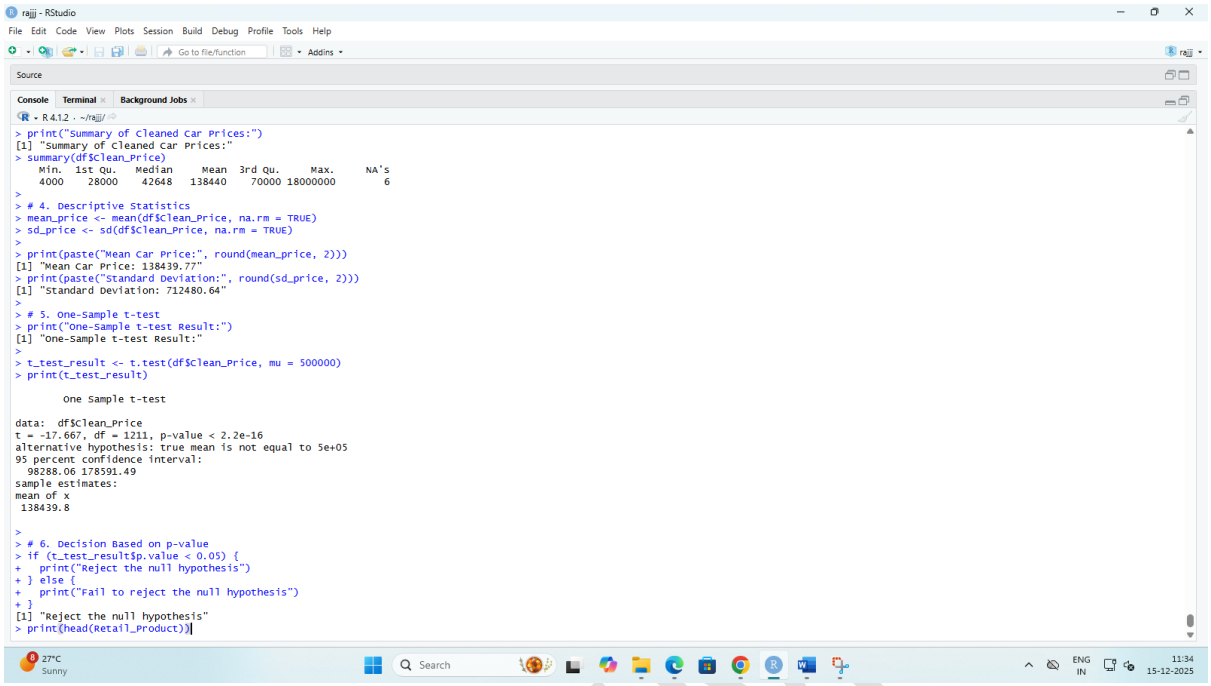

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