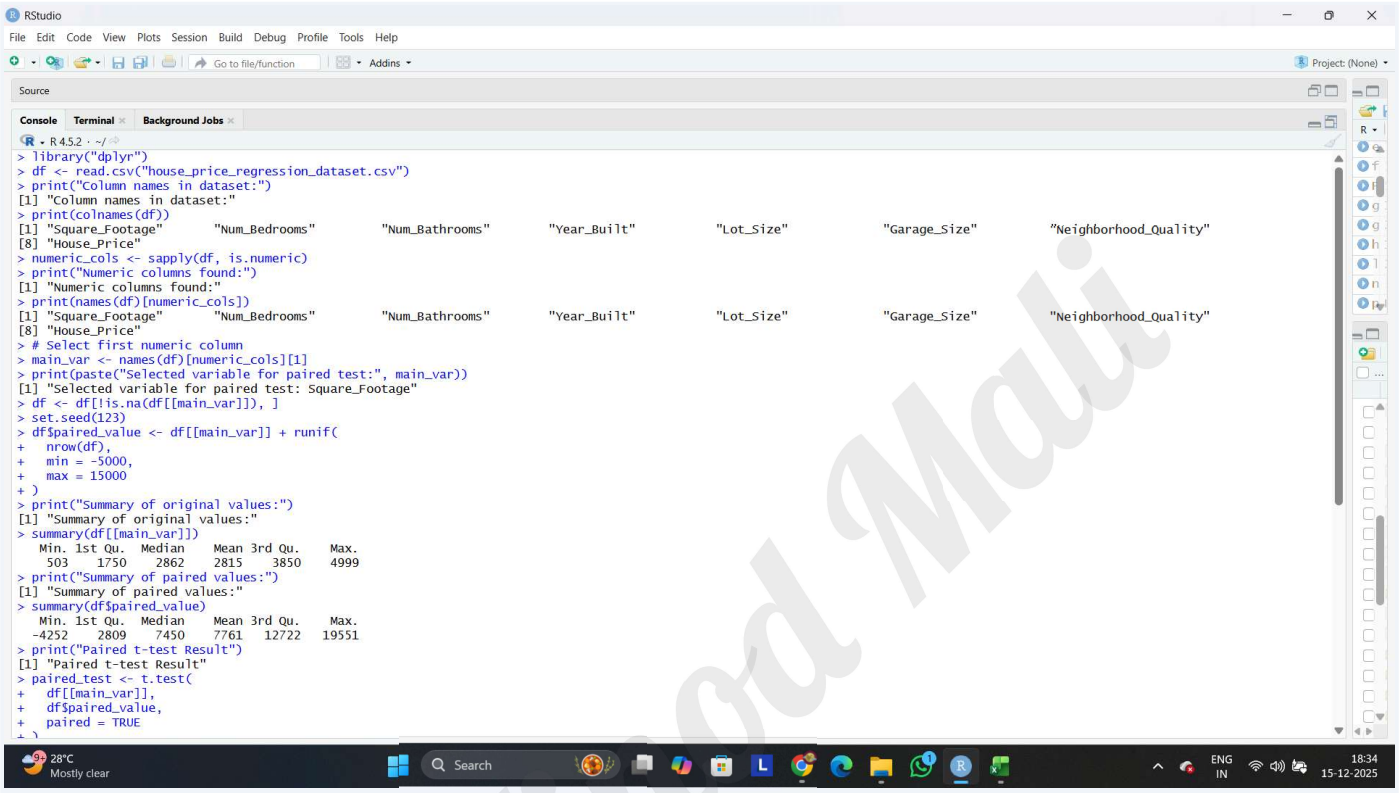
Sheth L.U.J & Sir M.V College Of Science
Subject :- Data Analysis with SAS/SPSS/R
Practical No 6

Aim :- Performing paired t-tests using t.test(paired=TRUE) (R).



```
> library("dplyr")
> df <- read.csv("house_price_regression_dataset.csv")
> print("Column names in dataset:")
[1] "Column names in dataset:"
> print(colnames(df))
[1] "Square_Footage"       "Num_Bedrooms"         "Num_Bathrooms"        "Year_Built"           "Lot_Size"             "Garage_Size"          "Neighborhood_Quality"
[8] "House_Price"
> numeric_cols <- sapply(df, is.numeric)
> print("Numeric columns found:")
[1] "Numeric columns found:"
> print(names(df)[numeric_cols])
[1] "Square_Footage"       "Num_Bedrooms"         "Num_Bathrooms"        "Year_Built"           "Lot_Size"             "Garage_Size"          "Neighborhood_Quality"
[8] "House_Price"
> # Select first numeric column
> main_var <- names(df)[numeric_cols][1]
> print(paste("Selected variable for paired test:", main_var))
[1] "Selected variable for paired test: Square_Footage"
> df <- df[!is.na(df[[main_var]]), ]
> set.seed(123)
> df$paired_value <- df[[main_var]] + runif(
+   nrow(df),
+   min = -5000,
+   max = 15000
+ )
> print("Summary of original values:")
[1] "Summary of original values:"
> summary(df[[main_var]])
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
    503    1750    2862    2815    3850    4999
> print("Summary of paired values:")
[1] "Summary of paired values:"
> summary(df$paired_value)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  -4252    2809    7450    7761   12722   19551
> print("Paired t-test Result")
[1] "Paired t-test Result"
> paired_test <- t.test(
+   df[[main_var]],
+   df$paired_value,
+   paired = TRUE
+ )
> print(paired_test)

        Paired t-test

data:  df[[main_var]] and df$paired_value
t = -27.2, df = 999, p-value < 2.2e-16
alternative hypothesis: true mean difference is not equal to 0
95 percent confidence interval:
 -5302.351 -4588.762
sample estimates:
mean difference
      -4945.556

> if (paired_test$p.value < 0.05) {
+   print("Decision: Reject the null hypothesis.")
+   print("Conclusion: There is a significant difference between paired observations.")
+ } else {
+   print("Decision: Fail to reject the null hypothesis.")
+   print("Conclusion: No significant difference between paired observations.")
+ }
[1] "Decision: Reject the null hypothesis."
[1] "Conclusion: There is a significant difference between paired observations."
> print("Paired t-test executed successfully.")
[1] "Paired t-test executed successfully."
>
```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