SHETH L.U.J AND SIR M.V. COLLEGE
SUBJECT :- DATA ANALYSIS WITH SAS/SPSS/R

MODULE 2 - PRACTICAL – 6

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

OUTPUT:-

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Screenshot 1 — RStudio Console output:

```
of time I gave this game.", 'NÃo sou muito de jogo indie, admito que joguei poucos, mas devo dizer que Hades foi um dos melhores jogos que joguei na vida, facilmente no top 15. Toda sua arte,
dublagem, gameplay, carisma dos personagens, Ã© tudo incr ... <truncated>
3
['This game is the game (that is not CS:GO) that I have played the most ever. I have played this game for 400 hours.', "A really good switch game, however didn't really grip me like mario odyss
ey", "I was very disappointed by the final boss fight, but the rest of the game is so good it makes me not want to even do the final boss fight anyway just so i can play more of the game. i do
wish that there were more unique mechanics in combat besides just parrying and link's flurry rush, but the world is really pretty and actually incentivizes exploring it. characters are great, s
tory is great and makes you work for it, and there's tons of hidden secrets and details.", 'em 105 horas de jogo nÃo houve um segundo que eu nÃo tava me divertindo e eu acho que isso diz muit
o', 'Sencillamente el mejor juego que he tenido el placer de disfrutar, esperÃ© 5 aÃ±os para poder jugarlo y puedo decir que valiÃ³ cada segundo la espera. No estoy ni cerca de conseguir el 10
0%, tengo mas de 100 horas y aÃ°n estoy descubriendo cosas nuevas. Va mÃ¡s allÃ¡ de un simple juego, es una experiencia que lamentablemente solo se puede vivir ... <truncated>
4
['soundtrack is tied for #1 with nier automata.  a super charming story and characters which have become iconic. and all that made by 1 man. thats it, thats t ... <truncated>
5 ["this games worldbuilding is incredible, with its amazing soundtrack and gorgeous art direction it really makes you feel like you're spiderman.  one of the best value in gaming tbh, this gam
e is packed full of content and none of it feels like filler. even the boss rush manages to feel fresh by introducing some surprise bosses/boss variants as rewards for beating tough pantheons.
cant wait to play silksong when i turn 80!", "This isn't just a game, this is an entire experience.\\n               \\n          I was not too much into Metroidvania games and
then I tried this without any expectation, it became one of my favorite games of all time and brought me into the genre, now I'm seeking for similar adventures and I can't wait for Silksong.\\n
\\n          I've done all 112% in my first run and now I'm beating the game again, then I'll aim to master the game on Steam, and this is the first time a game instigated me to do t
hat. Masterpiece.", 'Faz uns 2/3 anos que eu zerei esse jogo, mesmo assim nunca saiu da minha memÃ³ria.\\n          \\n          vou rejogar para fazer uma anÃ¡lise mais a
profundada', 'i like how you can bounce on spikes with your nail. a good casual game that offers additional challenges for people that are socially challenged', 'A rivetting action/adventure ga
me with a stunning design. Extremely rewarding but also gruesomly difficult at times.', 'I\\'d give this game a 4 for each individual aspect (platforming, exploration, combat) but the integrati
on and packaging of the content are so good, it\\'s slightly better that the sum of its parts. Most of the combat and traversal abilities feel useful, and many evoke that Super Metroid-y, gleef
ul feeling that you\\'ll finally be able to access that new area, grab that item, or beat that boss. The end-game challenges, reminiscent of wiley\\'s fortress and boss rushes after Megaman has
fully self-actualized, were the highlight. Boss ... <truncated>
6
['Minecraft is what you make of it. Unfortunately theres no reason to do anything.', 'muito bom, vc pode construir, usar sua imaginaÃ§Ão, mods, sobreviver, jogar multiplayer e atÃ© zerar o jog
o! minecraft Ã© um jogo incrÃvel e ... <truncated>
  Plays Playing Backlogs wishlist
1  17K   3.8K    4.6K    4.8K
2  21K   3.2K    6.3K    3.6K
3  30K   2.5K     5K     2.6K
4  28K   679     4.9K    1.8K
5  21K   2.4K    8.3K    2.3K
6  33K   1.8K    1.1K     230
> str(df)
'data.frame':   1512 obs. of  14 variables:
 $ X                : int  0 1 2 3 4 5 6 7 8 9 ...
 $ Title            : chr  "Elden Ring" "Hades" "The Legend of Zelda: Breath of the Wild" "Undertale" ...
 $ Release.Date     : chr  "Feb 25, 2022" "Dec 10, 2019" "Mar 03, 2017" "Sep 15, 2015" ...
 $ Team             : chr  "['Bandai Namco Entertainment', 'FromSoftware']" "['Supergiant Games']" "['Nintendo', 'Nintendo EPD Production Group No. 3']" "['tobyfox', '8-4']" ...
 $ Rating           : num  4.5 4.3 4.4 4.2 4.4 4.3 4.2 4.3 3 4.3 ...
 $ Times.Listed     : chr  "3.9K" "2.9K" "4.3K" "3.5K" ...
 $ Number.of.Reviews: chr  "3.9K" "2.9K" "4.3K" "3.5K" ...
 $ Genres           : chr  "['Adventure', 'RPG']" "['Adventure', 'Brawler', 'Indie', 'RPG']" "['Adventure', 'RPG']" "['Adventure', 'Indie', 'RPG', 'Turn Based Strategy']" ...
 $ Summary          : chr  "Elden Ring is a fantasy, action and open world game with RPG elements such as stats, weapons and spells. Rise, "|__truncated__ "A rogue-lite hack and slash dungeon
```


Screenshot 2 — RStudio Console output:

```
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 $ Summary          : chr  "Elden Ring is a fantasy, action and open world game with RPG elements such as stats, weapons and spells. Rise, "|__truncated__ "A rogue-lite hack and slash dungeon
crawler in which Zagreus, son of Hades the Greek god of the dead, attempts "|__truncated__ "The Legend of Zelda: Breath of the Wild is the first 3D open-world game in the Zelda series. Link ca
n travel an"|__truncated__ "A small child falls into the underground, where monsters have long been banished by humans and are hunting ever"|__truncated__ ...
 $ Reviews          : chr  "[\"The first playthrough of elden ring is one of the best eperiences gaming can offer you but after youve explo"|__truncated__ "['convinced this is a roguelike for
people who do not like the genre. The art is technically good but the aesth"|__truncated__ "['This game is the game (that is not CS:GO) that I have played the most ever. I have played this gam
e for 400 h"|__truncated__ "['soundtrack is tied for #1 with nier automata.  a super charming story and characters which have become iconic"|__truncated__ ...
 $ Plays            : chr  "17K" "21K" "30K" "28K" ...
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 $ Backlogs         : chr  "4.6K" "6.3K" "5K" "4.9K" ...
 $ wishlist         : chr  "4.8K" "3.6K" "2.6K" "1.8K" ...
> dim(df)
[1] 1512   14
>
> # 3. Create Paired Variables
> set.seed(123)   # for reproducibility
>
> df$Rating_Before <- df$Rating
> df$Rating_After  <- df$Rating + runif(nrow(df), -0.2, 0.2)
>
> print("Summary of Rating Before:")
[1] "Summary of Rating Before:"
> summary(df$Rating_Before)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
  0.700   3.400   3.800   3.719   4.100   4.800      13
>
> print("Summary of Rating After:")
[1] "Summary of Rating After:"
> summary(df$Rating_After)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
 0.8352  3.4193  3.7806  3.7179  4.1178  4.8271      13
>
> # 4. Prepare Paired Data
```

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>
> # 4. Prepare Paired Data
> paired_df <- df %>%
+   select(Rating_Before, Rating_After) %>%
+   na.omit()
>
> print("Number of paired observations:")
[1] "Number of paired observations:"
> nrow(paired_df)
[1] 1499
>
> # 5. Descriptive Statistics
> mean_before <- mean(paired_df$Rating_Before)
> mean_after  <- mean(paired_df$Rating_After)
>
> print(paste("Mean Rating Before:", round(mean_before, 2)))
[1] "Mean Rating Before: 3.72"
> print(paste("Mean Rating After:", round(mean_after, 2)))
```

```
> mean_after  <- mean(paired_df$Rating_After)
>
> print(paste("Mean Rating Before:", round(mean_before, 2)))
[1] "Mean Rating Before: 3.72"
> print(paste("Mean Rating After:", round(mean_after, 2)))
[1] "Mean Rating After: 3.72"
>
> # 6. Paired t-test
> # H0: Mean difference between ratings is zero
> # H1: Mean difference between ratings is not zero
>
> print("Paired t-test Result:")
[1] "Paired t-test Result:"
> t_test_result <- t.test(
+   paired_df$Rating_Before,
+   paired_df$Rating_After,
+   paired = TRUE
+ )
>
> print(t_test_result)

        Paired t-test

data:  paired_df$Rating_Before and paired_df$Rating_After
t = 0.5012, df = 1498, p-value = 0.6163
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -0.004319808  0.007284937
sample estimates:
mean of the differences
           0.001482564


>
> # 7. 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")
+ }
[1] "Fail to reject the null hypothesis"
> print(head(Retail_Product))
```

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