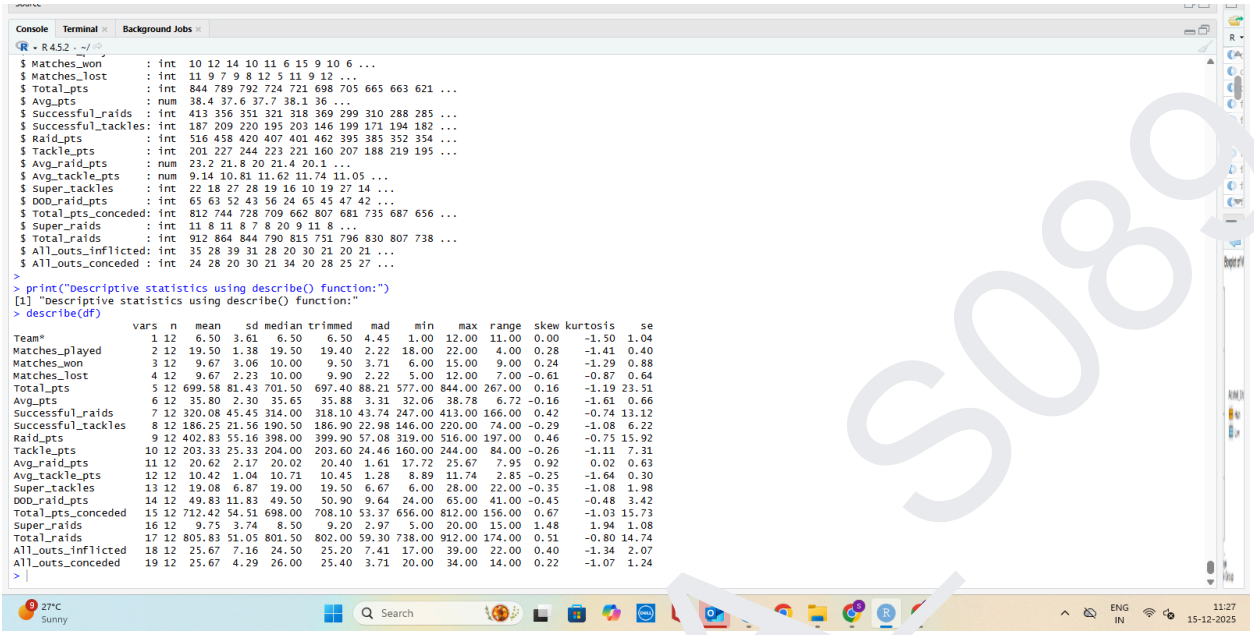
SHETH L.U.J AND SIR M.V COLLEGE
PRACTICAL NO: MODULE 2 (1 TO 6)

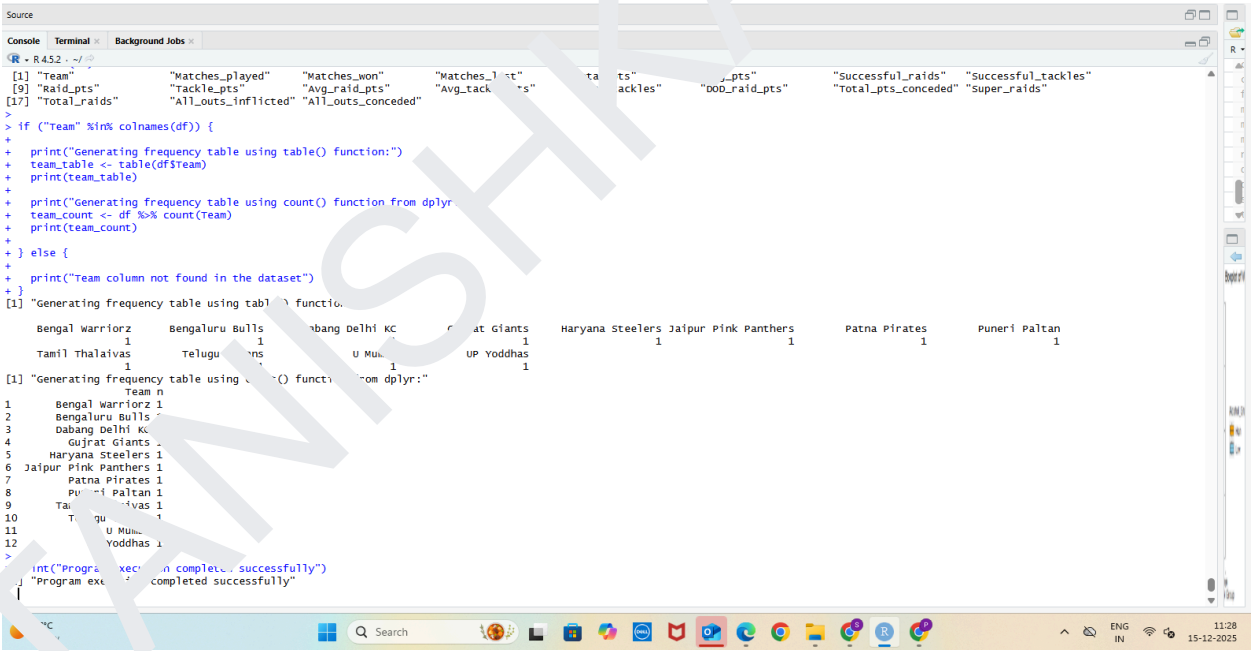
Outputs:

Module 2 Practical 1



```
 $ Matches_won       : int  10 12 14 10 11 6 15 9 10 6 ...
 $ Matches_lost      : int  11 9 7 9 8 12 5 11 9 12 ...
 $ Total_pts         : int  844 789 792 724 721 698 705 665 663 621 ...
 $ Avg_pts           : num  38.4 37.6 37.7 38.1 36 ...
 $ Successful_raids  : int  413 356 351 321 318 369 299 310 288 285 ...
 $ Successful_tackles: int  187 209 220 195 203 146 199 171 194 182 ...
 $ Raid_pts          : int  516 458 420 407 401 462 395 385 352 354 ...
 $ Tackle_pts        : int  201 227 244 223 221 160 207 188 219 195 ...
 $ Avg_raid_pts      : num  23.2 21.8 20 21.4 20.1 ...
 $ Avg_tackle_pts    : num  9.14 10.81 11.62 11.74 11.05 ...
 $ Super_tackles     : int  22 18 27 28 19 16 10 19 27 14 ...
 $ DOD_raid_pts      : int  65 63 52 43 56 24 65 45 47 42 ...
 $ Total_pts_conceded: int  812 744 728 709 662 807 681 735 687 656 ...
 $ Super_raids       : int  11 8 11 8 7 8 20 9 11 8 ...
 $ Total_raids       : int  912 864 844 790 815 751 796 830 807 738 ...
 $ All_outs_inflicted: int  35 28 39 31 28 20 30 21 20 21 ...
 $ All_outs_conceded : int  24 28 20 30 21 34 20 28 25 27 ...
>
> print("Descriptive statistics using describe() function:")
[1] "Descriptive statistics using describe() function:"
> describe(df)
                    vars  n   mean    sd median trimmed   mad    min    max  range  skew kurtosis    se
Team*                  1 12   6.50  3.61   6.50    6.50  4.45   1.00  12.00  11.00  0.00    -1.50  1.04
Matches_played         2 12  19.50  1.38  19.50   19.40  2.22  18.00  22.00   4.00  0.28    -1.41  0.40
Matches_won            3 12   9.67  3.06  10.00    9.50  3.71   6.00  15.00   9.00  0.24    -1.29  0.88
Matches_lost           4 12   9.67  2.23  10.00    9.90  2.22   5.00  12.00   7.00 -0.61    -0.87  0.64
Total_pts              5 12 699.58 81.43 701.50  697.40 88.21 577.00 844.00 267.00  0.16    -1.19 23.51
Avg_pts                6 12  35.80  2.30  35.65   35.88  3.31  32.06  38.78   6.72 -0.16    -1.61  0.66
Successful_raids       7 12 320.08 45.45 314.00  318.10 43.74 247.00 413.00 166.00  0.42    -0.74 13.12
Successful_tackles     8 12 186.25 21.56 190.50  186.90 22.98 146.00 220.00  74.00 -0.29    -1.08  6.22
Raid_pts               9 12 402.83 55.16 398.00  399.90 57.08 319.00 516.00 197.00  0.46    -0.75 15.92
Tackle_pts            10 12 203.33 25.33 204.00  203.60 24.46 160.00 244.00  84.00 -0.26    -1.11  7.31
Avg_raid_pts          11 12  20.62  2.17  20.02   20.40  1.61  17.72  25.67   7.95  0.92     0.02  0.63
Avg_tackle_pts        12 12  10.42  1.04  10.71   10.45  1.28   8.89  11.74   2.85 -0.25    -1.64  0.30
Super_tackles         13 12  19.08  6.87  19.00   19.50  6.67   6.00  28.00  22.00 -0.35    -1.08  1.98
DOD_raid_pts          14 12  49.83 11.83  49.50   50.90  9.64  24.00  65.00  41.00 -0.45    -0.48  3.42
Total_pts_conceded    15 12 712.42 54.51 698.00  708.10 53.37 656.00 812.00 156.00  0.67    -1.03 15.73
Super_raids           16 12   9.75  3.74   8.50    9.20  2.97   5.00  20.00  15.00  1.48     1.94  1.08
Total_raids           17 12 805.83 51.05 801.50  802.00 59.30 738.00 912.00 174.00  0.51    -0.80 14.74
All_outs_inflicted    18 12  25.67  7.16  24.50   25.20  7.41  17.00  39.00  22.00  0.40    -1.34  2.07
All_outs_conceded     19 12  25.67  4.29  26.00   25.40  3.71  20.00  34.00  14.00  0.22    -1.07  1.24
>
```

Practical 2

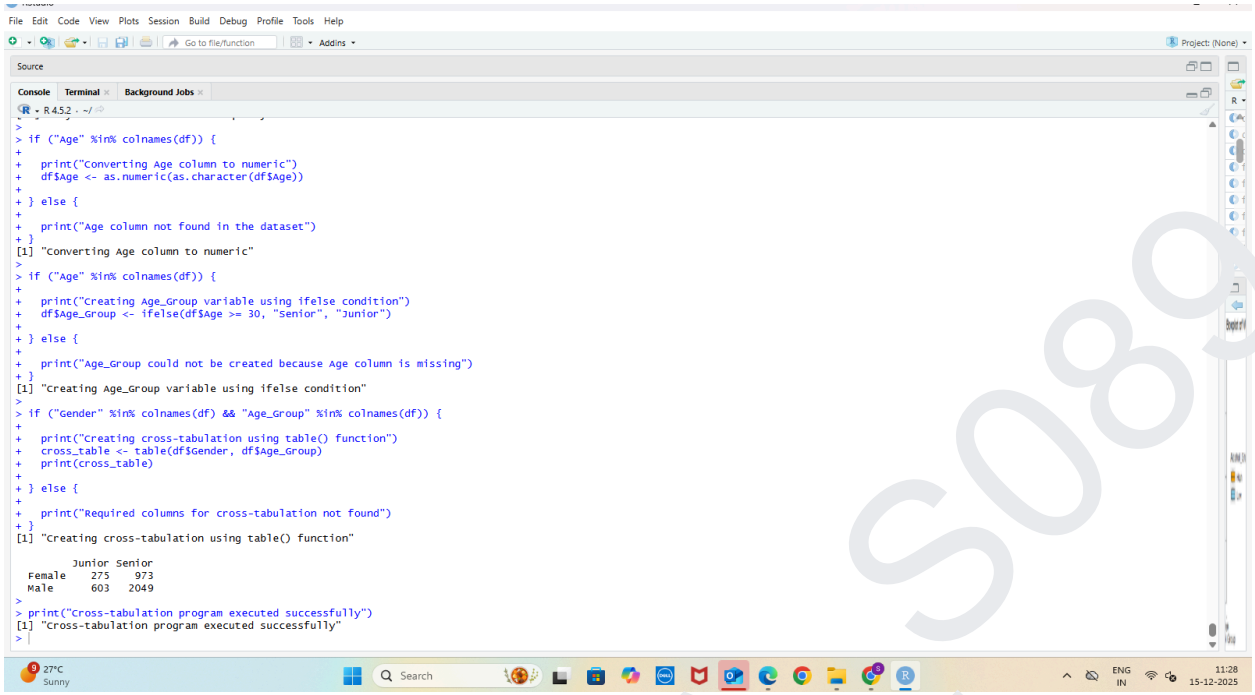


```
 [1] "Team"            "Matches_played"     "Matches_won"        "Matches_lost"       "Total_pts"          "Avg_pts"            "Successful_raids"   "Successful_tackles"
 [9] "Raid_pts"        "Tackle_pts"         "Avg_raid_pts"       "Avg_tackle_pts"     "Super_tackles"      "DOD_raid_pts"       "Total_pts_conceded" "Super_raids"
[17] "Total_raids"     "All_outs_inflicted" "All_outs_conceded"
>
> if ("Team" %in% colnames(df)) {
+
+   print("Generating frequency table using table() function:")
+   team_table <- table(df$Team)
+   print(team_table)
+
+   print("Generating frequency table using count() function from dplyr
+   team_count <- df %>% count(Team)
+   print(team_count)
+
+ } else {
+
+   print("Team column not found in the dataset")
+ }
[1] "Generating frequency table using tabl
     Bengal Warriorz      Bengaluru Bulls      Dabang Delhi KC        Gujrat Giants     Haryana Steelers Jaipur Pink Panthers        Patna Pirates        Puneri Paltan
                   1                   1                   1                   1                   1                   1                   1                   1
     Tamil Thalaivas        Telugu Titans          U Mumba          UP Yoddhas
                   1                   1                   1                   1
[1] "Generating frequency table using
                Team n
1       Bengal Warriorz 1
2       Bengaluru Bulls 1
3       Dabang Delhi KC 1
4         Gujrat Giants 1
5      Haryana Steelers 1
6  Jaipur Pink Panthers 1
7         Patna Pirates 1
8         Puneri Paltan 1
9      Tamil Thalaivas 1
10      Telugu Titans 1
11          U Mumba 1
12       UP Yoddhas 1
>
```

Practical 3

NAME: TANISHKA K KUTWAL
ROLL NO: S089

SHETH L.U.J AND SIR M.V COLLEGE
PRACTICAL NO: MODULE 2 (1 TO 6)



```
> if ("Age" %in% colnames(df)) {
+
+   print("Converting Age column to numeric")
+   df$Age <- as.numeric(as.character(df$Age))
+
+ } else {
+
+   print("Age column not found in the dataset")
+ }
[1] "Converting Age column to numeric"
>
> if ("Age" %in% colnames(df)) {
+
+   print("Creating Age_Group variable using ifelse condition")
+   df$Age_Group <- ifelse(df$Age >= 30, "Senior", "Junior")
+
+ } else {
+
+   print("Age_Group could not be created because Age column is missing")
+ }
[1] "Creating Age_Group variable using ifelse condition"
>
> if ("Gender" %in% colnames(df) && "Age_Group" %in% colnames(df)) {
+
+   print("Creating cross-tabulation using table() function")
+   cross_table <- table(df$Gender, df$Age_Group)
+   print(cross_table)
+
+ } else {
+
+   print("Required columns for cross-tabulation not found")
+ }
[1] "Creating cross-tabulation using table() function"

        Junior Senior
  Female    275    973
  Male      603   2049
>
> print("Cross-tabulation program executed successfully")
[1] "Cross-tabulation program executed successfully"
>
```

Practical 4

NAME: TANISHKA K KUTWAL
ROLL NO: S089

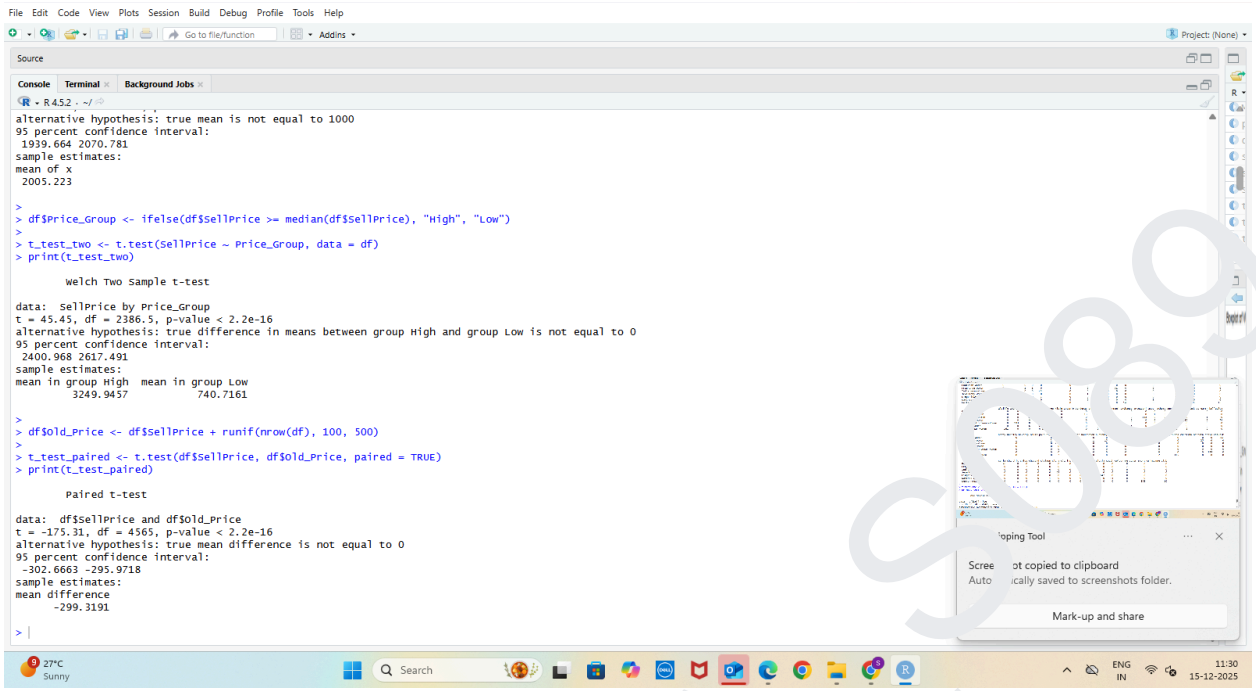
SHETH L.U.J AND SIR M.V COLLEGE
PRACTICAL NO: MODULE 2 (1 TO 6)

```
Console   Terminal   Background Jobs
R 4.5.2 · ~/
> category_counts <- table(df$Category)
> print(category_counts)

        Footwear-Women        Fragrance-Women        Indianwear-Women        Jewellery-Women Lingerie&Nightwear-Women        Watches-Women        Westernwear-Women
                   480                    167                    1131                    438                      367                  329                     1654
>
> category_df <- df %>% count(Category)
> print(category_df)
                  Category    n
1           Footwear-Women  480
2          Fragrance-Women  167
3         Indianwear-Women 1131
4          Jewellery-Women  438
5 Lingerie&Nightwear-Women  367
6            Watches-Women  329
7        Westernwear-Women 1654
>
> cross_tab <- table(df$Category, df$BrandName)
> print(cross_tab)

                           109f 18.21 man made 4711 aarke abercrombie & fitch accessorize adidas aigner ajmal alcis alexandre christie all good scents allen solly allen [illegible] ribe
  Footwear-Women              0              0    0     0                   0           0     86      0     0     0                  0               0           0       0
  Fragrance-Women             0              1    1     0                   5           0      0      2    31     0                  0               3           0       0
  Indianwear-Women            0              0    0    43                   0           0      0      0     0     0                  0               0           0       [illegible]
  Jewellery-Women             0              0    0     0                   0           1      0      0     0     0                  0               0           0
  Lingerie&Nightwear-Women    0              0    0     1                   0           0     22      0     0     0                  0               0           4       0
  Watches-Women               0              0    0     0                   0           0      0      0     0     0                  1               0           0       0
  Westernwear-Women         114              0    0     1                   0           0    140      0     0    14                  0               0  [illegible]      15

                           altlife amante amazfit amukti and anne klein antonio banderas arcelia ariana armani exchange arteastri aspen athome aurelia [illegible]esha back [illegible]arth [illegible]eziya
  Footwear-Women                 0      0       0      0   0          0                0       0      0               0         0     0      0       0        0              0
  Fragrance-Women                0      0       0      0   7          0               13      21      0               0         0     1      0       0        0
  Indianwear-Women               0      0       0     93  13          0                0       0      0               0       138     0      0     486       69                     0
  Jewellery-Women                0      0       0      0   0          0                0       0      0               0         0     0      0       0        0                    74
  Lingerie&Nightwear-Women       0    193       0      0   0          0                0       0      0               0         0     0              0                             0
  Watches-Women                  0      0      16      0   0         56                0       0      0              31         0     0              0                             0
  Westernwear-Women            161      0       0      0 689          0                0       0      2               0         0     0      1       0        2                     0

                           betty barclay beverly hills polo club biba black panther boucheron burberry calvin klein calvin klein unde[illegible]ar campus su[illegible] [illegible]lina herr[illegible]a casio catwalk
  Footwear-Women                       0                       0    0             0         0        0            0                  0                                0     0     237
  Fragrance-Women                      1                       2    0             0         1       15           16                                0               25     0       0
  Indianwear-Women                     0                       0  288             0         0        0            0                                0                0     0       0
  Jewellery-Women                      0                       0    0             0         0        0            0                  0             0                0     0       0
```

```
Console   Terminal   Background Jobs
R 4.5.2 · ~/
  Footwear-Women              0              0    0     0                   0           0     86      0     0     0                  0               0           0       0
  Fragrance-Women             0              1    1     0                   5           0      0      2    [illegible]     0                  0               [illegible]           0       0
  Indianwear-Women            0              0    0    43                   0           0      0      0           0                  0               0           0       0
  Jewellery-Women             0              0    0     0                   0           1      0      0     0                        0               0           0       0
  Lingerie&Nightwear-Women    0              0    0     1                   0           0     22      0                            0               0           4       0
  Watches-Women               0              0    0     0                   0           0      0      0           0                  1               0           0       0
  Westernwear-Women         114              0    0     1                   0           0    140      0          14                  0               0         235      15

                           altlife amante amazfit amukti and anne klein antonio banderas arce[illegible] ariana arman[illegible] [illegible]ge arteastri aspen [illegible]ome aurelia ayesha back to earth belleziya
  Footwear-Women                 0      0       0      0   0          0                0              0                0         0     0      0       0      0             0         0
  Fragrance-Women                0      0       0      0   7          0               13              0                0         0     1      0       0      0             0         0
  Indianwear-Women               0      0       0     93  13          0                0              0                0       138     0      0     486     69             1         0
  Jewellery-Women                0      0       0      0   0          0                0              0                0         0     0      0       0    310             0        74
  Lingerie&Nightwear-Women       0    193       0      0   0          0                0              0                0         0     0      0       0      0             0         0
  Watches-Women                  0      0      16      0   0         56                                               31         0     0      0       0      0             0         0
  Westernwear-Women            161      0       0      0 689          0                                                0         0     0      1       0      2             0         0

                           betty barclay beverly hills polo club biba black p[illegible]r bouche[illegible]rberry calvin klein calvin klein underwear campus sutra carolina herrera casio catwalk
  Footwear-Women                       0                       0    0                              0            0                      0            0                0     0     237
  Fragrance-Women                      1                       2    0                   1         15           16                      0            0               25     0       0
  Indianwear-Women                     0                       0  288        [illegible]         0          0            0                      0            0                0     0       0
  Jewellery-Women                      0                       0    0                   0                       0                      0            0                0     0       0
  Lingerie&Nightwear-Women             0                       0    0                   0          0            0                      0            0                0     0       0
  Watches-Women                        0                       0              0                    0            0                      0            0                0   198       0
  Westernwear-Women                    0                       0              2                    0            0                      2          115                0     0       0

                           ceriz charchit chloe chopard ci[illegible]n clara c[illegible]s clarks clinique clovia coach colour me cover story crimsoune club
  Footwear-Women              96        0     0                    0             61        0      0     0         0           0              0
  Fragrance-Women              0        0     2                    0              0        1      0     8         7           0              0
  Indianwear-Women             0        0     0       0      0     0      0       0        0      0     0         0           0              0
  Jewellery-Women              0        0     0       0      0            0                0      0     0         0           0              0
  Lingerie&Nightwear-Women     0        0     0       0                   0       0        0    147     0         0           0              0
  Watches-Women                0        0     0       0            0      0       0        0      0    23         0           0              0
  Westernwear-Women            0        1     0              0     0      0       0        0      0     0         0         148             10
>
> t_test_one <- t.test(df$SellPrice, mu = [illegible])
> print(t_test_one)

        One Sample t-test

data:  df$SellPrice
t = 30.06, df = 4565, p-value < 2.2e-16
alternative hypothesis: true mean is not e[illegible] to 1000
```

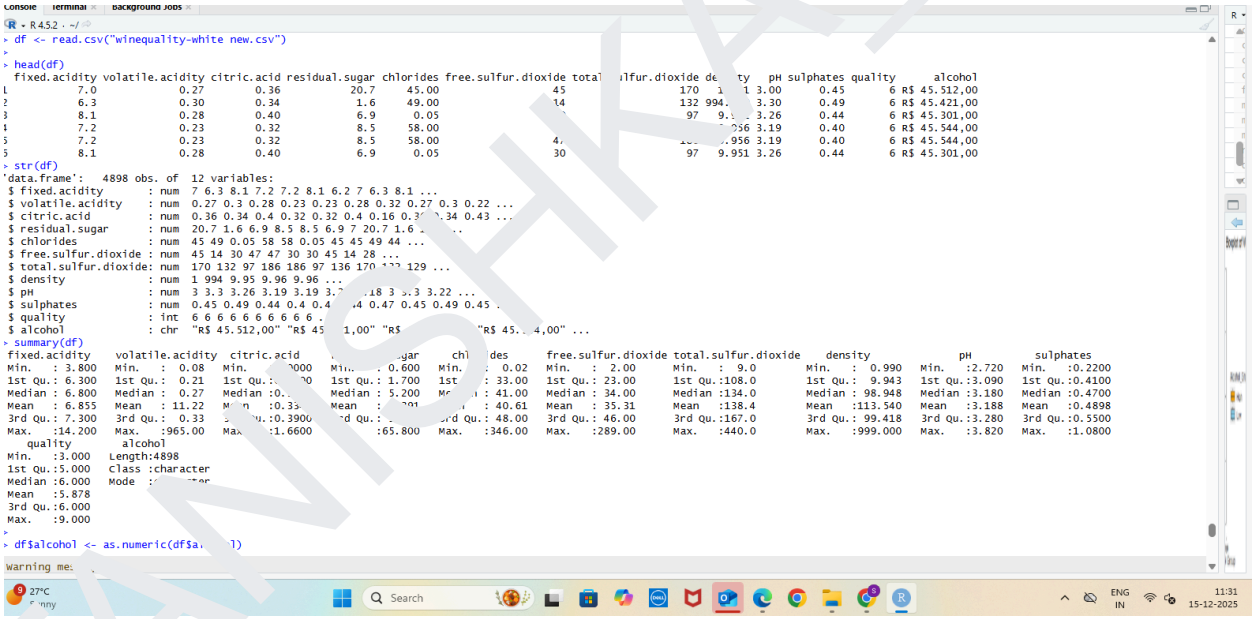

NAME: TANISHKA K KUTWAL
ROLL NO: S089

SHETH L.U.J AND SIR M.V COLLEGE
PRACTICAL NO: MODULE 2 (1 TO 6)



```
alternative hypothesis: true mean is not equal to 1000
95 percent confidence interval:
 1939.664 2070.781
sample estimates:
mean of x
 2005.223

>
> df$Price_Group <- ifelse(df$SellPrice >= median(df$SellPrice), "High", "Low")
>
> t_test_two <- t.test(SellPrice ~ Price_Group, data = df)
> print(t_test_two)

        Welch Two Sample t-test

data:  SellPrice by Price_Group
t = 45.45, df = 2386.5, p-value < 2.2e-16
alternative hypothesis: true difference in means between group High and group Low is not equal to 0
95 percent confidence interval:
 2400.968 2617.491
sample estimates:
mean in group High  mean in group Low
         3249.9457           740.7161

>
> df$Old_Price <- df$SellPrice + runif(nrow(df), 100, 500)
>
> t_test_paired <- t.test(df$SellPrice, df$Old_Price, paired = TRUE)
> print(t_test_paired)

        Paired t-test

data:  df$SellPrice and df$Old_Price
t = -175.31, df = 4565, p-value < 2.2e-16
alternative hypothesis: true mean difference is not equal to 0
95 percent confidence interval:
 -302.6663 -295.9718
sample estimates:
mean difference
      -299.3191

>
```

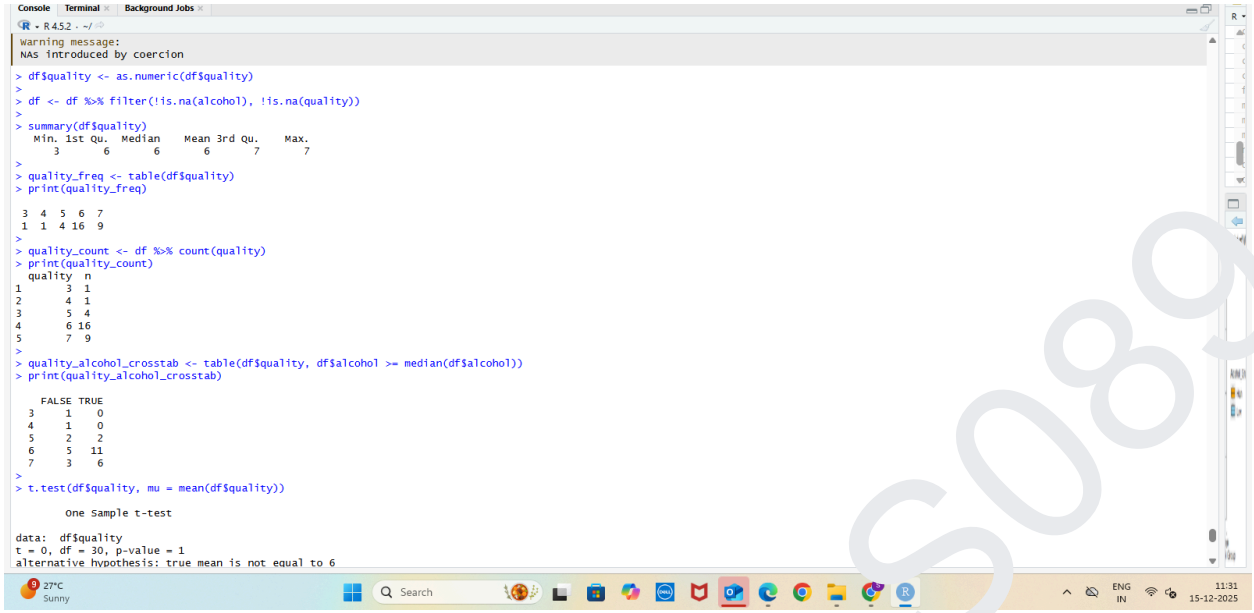
Practical 5



```
> df <- read.csv("winequality-white new.csv")
>
> head(df)
  fixed.acidity volatile.acidity citric.acid residual.sugar chlorides free.sulfur.dioxide total.sulfur.dioxide density   pH sulphates quality      alcohol
1           7.0             0.27        0.36           20.7     45.00                   45                  170   1.001 3.00      0.45       6 R$ 45.512,00
2           6.3             0.30        0.34            1.6     49.00                   14                  132 994.0   3.30      0.49       6 R$ 45.421,00
3           8.1             0.28        0.40            6.9      0.05                   30                   97   9.951 3.26      0.44       6 R$ 45.301,00
4           7.2             0.23        0.32            8.5     58.00                                             .956 3.19      0.40       6 R$ 45.544,00
5           7.2             0.23        0.32            8.5     58.00                   47                  .956 3.19      0.40       6 R$ 45.544,00
6           8.1             0.28        0.40            6.9      0.05                   30                   97   9.951 3.26      0.44       6 R$ 45.301,00
> str(df)
'data.frame':   4898 obs. of  12 variables:
 $ fixed.acidity       : num  7 6.3 8.1 7.2 7.2 8.1 6.2 7 6.3 8.1 ...
 $ volatile.acidity    : num  0.27 0.3 0.28 0.23 0.23 0.28 0.32 0.27 0.3 0.22 ...
 $ citric.acid         : num  0.36 0.34 0.4 0.32 0.32 0.4 0.16 0.3 0.34 0.43 ...
 $ residual.sugar      : num  20.7 1.6 6.9 8.5 8.5 6.9 7 20.7 1.6 1.5 ...
 $ chlorides           : num  45 49 0.05 58 58 0.05 45 45 49 44 ...
 $ free.sulfur.dioxide : num  45 14 30 47 47 30 30 45 14 28 ...
 $ total.sulfur.dioxide: num  170 132 97 186 186 97 136 170 132 129 ...
 $ density             : num  1 994 9.95 9.96 9.96 ...
 $ pH                  : num  3 3.3 3.26 3.19 3.19 3.1 .18 3 3.3 3.22 ...
 $ sulphates           : num  0.45 0.49 0.44 0.4 0.4 .4 0.47 0.45 0.49 0.45 .
 $ quality             : int  6 6 6 6 6 6 6 6 6 6 .
 $ alcohol             : chr  "R$ 45.512,00" "R$ 45. 1,00" "R$ "R$ 45.. 4,00" ...
> summary(df)
 fixed.acidity    volatile.acidity  citric.acid       .  .gar      chl  des      free.sulfur.dioxide total.sulfur.dioxide    density             pH          sulphates
 Min.   : 3.800   Min.   :  0.08   Min.   .  0000   Min.   . 0.600   Min.   :  0.02   Min.   :  2.00      Min.   :  9.0       Min.   :  0.990   Min.   :2.720   Min.   :0.2200
 1st Qu.: 6.300   1st Qu.:  0.21   1st Qu.:  00     1st Qu.: 1.700   1st    : 33.00   1st Qu.: 23.00      1st Qu.:108.0       1st Qu.:  9.943   1st Qu.:3.090   1st Qu.:0.4100
 Median : 6.800   Median :  0.27   Median :0.       Median : 5.200   M      : 41.00   Median : 34.00      Median :134.0       Median : 98.948   Median :3.180   Median :0.4700
 Mean   : 6.855   Mean   : 11.22   M  n   :0.33     Mean   :  201    .      : 40.61   Mean   : 35.31      Mean   :138.4       Mean   :113.540   Mean   :3.188   Mean   :0.4898
 3rd Qu.: 7.300   3rd Qu.:  0.33   3  .u.:0.3900    rd Qu.:  .       3rd Qu.: 48.00   3rd Qu.: 46.00      3rd Qu.:167.0       3rd Qu.: 99.418   3rd Qu.:3.280   3rd Qu.:0.5500
 Max.   :14.200   Max.   :965.00   Max    :1.6600          :65.800   Max.   :346.00   Max.   :289.00      Max.   :440.0       Max.   :999.000   Max.   :3.820   Max.   :1.0800
    quality         alcohol
 Min.   :3.000   Length:4898
 1st Qu.:5.000   Class :character
 Median :6.000   Mode  :
 Mean   :5.878
 3rd Qu.:6.000
 Max.   :9.000
>
> df$alcohol <- as.numeric(df$a     l)
Warning me:
```

NAME: TANISHKA K KUTWAL
ROLL NO: S089

SHETH L.U.J AND SIR M.V COLLEGE
PRACTICAL NO: MODULE 2 (1 TO 6)



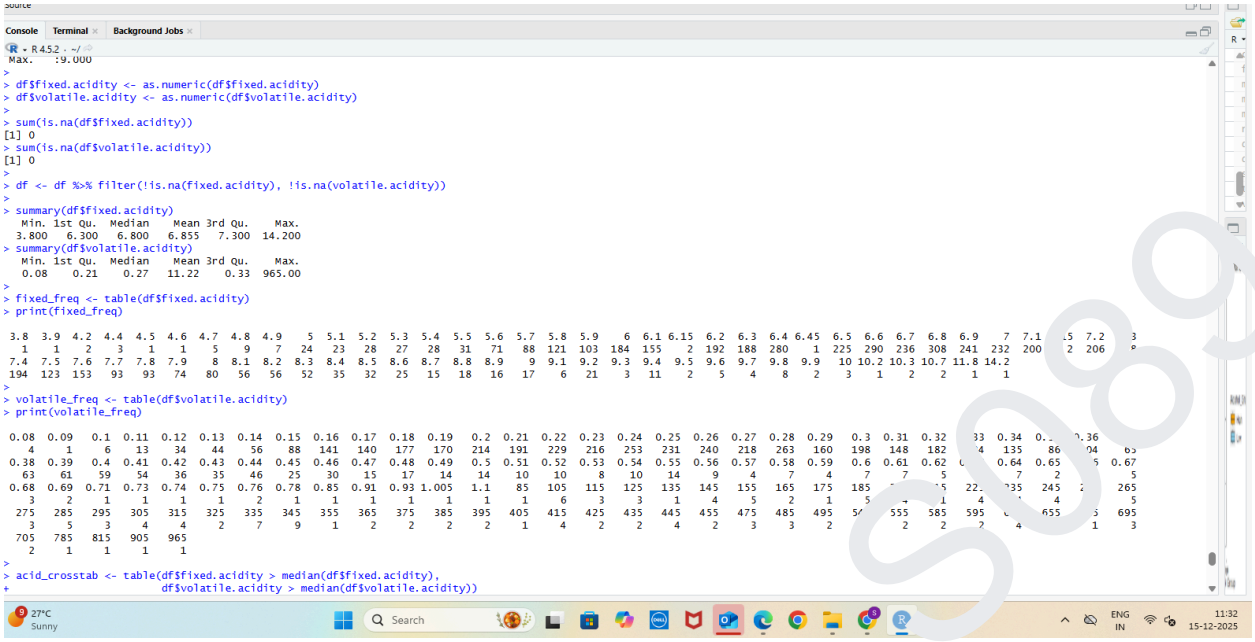
```
Warning message:
NAs introduced by coercion
> df$quality <- as.numeric(df$quality)
>
> df <- df %>% filter(!is.na(alcohol), !is.na(quality))
>
> summary(df$quality)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
      3       6       6       6       7       7
>
> quality_freq <- table(df$quality)
> print(quality_freq)

 3  4  5  6  7
 1  1  4 16  9
>
> quality_count <- df %>% count(quality)
> print(quality_count)
  quality  n
1       3  1
2       4  1
3       5  4
4       6 16
5       7  9
>
> quality_alcohol_crosstab <- table(df$quality, df$alcohol >= median(df$alcohol))
> print(quality_alcohol_crosstab)

   FALSE TRUE
  3     1    0
  4     1    0
  5     2    2
  6     5   11
  7     3    6
>
> t.test(df$quality, mu = mean(df$quality))

        One Sample t-test

data:  df$quality
t = 0, df = 30, p-value = 1
alternative hypothesis: true mean is not equal to 6
```

```
alternative hypothesis: true mean is not equal to 6
95 percent confidence interval:
 5.658525 6.341475
sample estimates:
mean of x
        6

>
> df$Alcohol_Group <- ifelse(df$alcohol >= median(df$alcohol),  gh", "
> df$Alcohol_Group <- factor(df$Alcohol_Group)
>
> t.test(quality ~ Alcohol_Group, data = df)

        Welch Two Sample t-test

data:  quality by Alcohol_Group
t = 1.4176, df = 14.702, p-value = 0.  72
alternative hypothesis: true differen  in m  betwe  group High and group Low is not equal to 0
95 percent confidence interval:
 -0.2753297  1.3630490
sample estimates:
mean in group High  mean  group
          6.210526          5.66666

>
> set.seed(123)
> df$quality_bef  quality  norm(nrow(df), mean = 0, sd = 0.5)
>
> t.test(df$quality,  $quality_ber  , paired = TRUE)

        ired t-test

data:  qua  d df$qua  y_before
t  0.18  , df =  value = 0.856
 ternati hypo esis.  e mean difference is not equal to 0
95 percent  r  ence interval:
 -0.1616711  .1934985
 mple estim  s:
  differen
  0.0159136

>
```

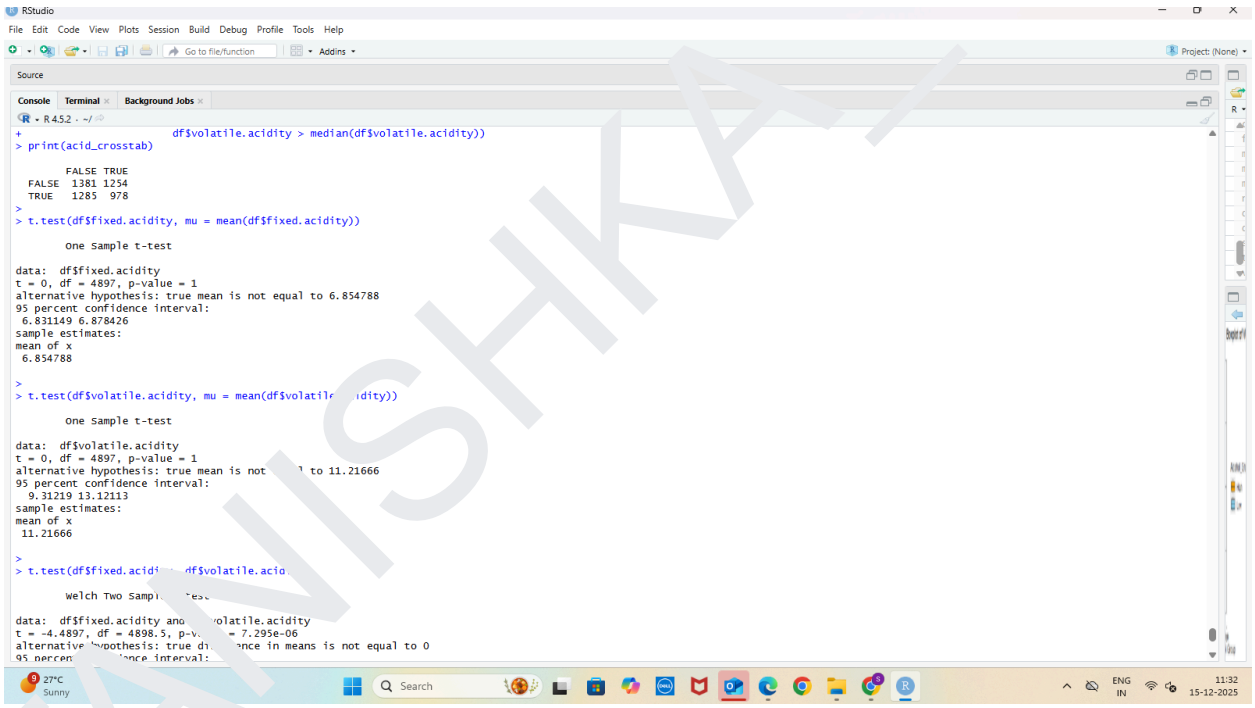
Practical 6

NAME: TANISHKA K KUTWAL
ROLL NO: S089

SHETH L.U.J AND SIR M.V COLLEGE
PRACTICAL NO: MODULE 2 (1 TO 6)



```
Max.    :9.000
> df$fixed.acidity <- as.numeric(df$fixed.acidity)
> df$volatile.acidity <- as.numeric(df$volatile.acidity)
> sum(is.na(df$fixed.acidity))
[1] 0
> sum(is.na(df$volatile.acidity))
[1] 0
> df <- df %>% filter(!is.na(fixed.acidity), !is.na(volatile.acidity))
> summary(df$fixed.acidity)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  3.800   6.300   6.800   6.855   7.300  14.200
> summary(df$volatile.acidity)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   0.08    0.21    0.27   11.22    0.33  965.00
> fixed_freq <- table(df$fixed.acidity)
> print(fixed_freq)

 3.8  3.9  4.2  4.4  4.5  4.6  4.7  4.8  4.9    5  5.1  5.2  5.3  5.4  5.5  5.6  5.7  5.8  5.9    6  6.1 6.15  6.2  6.3  6.4 6.45  6.5  6.6  6.7  6.8  6.9    7  7.1   15  7.2    3
   1    1    2    3    1    1    5    9    7   24   23   28   27   28   31   71   88  121  103  184  155    2  192  188  280    1  225  290  236  308  241  232  200    2  206    9
 7.4  7.5  7.6  7.7  7.8  7.9    8  8.1  8.2  8.3  8.4  8.5  8.6  8.7  8.8  8.9    9  9.1  9.2  9.3  9.4  9.5  9.6  9.7  9.8  9.9   10 10.2 10.3 10.7 11.8 14.2
 194  123  153   93   93   74   80   56   56   52   35   32   25   15   18   16   17    6   21    3   11    2    5    4    8    2    3    1    2    2    1    1
> volatile_freq <- table(df$volatile.acidity)
> print(volatile_freq)

 0.08  0.09   0.1  0.11  0.12  0.13  0.14  0.15  0.16  0.17  0.18  0.19   0.2  0.21  0.22  0.23  0.24  0.25  0.26  0.27  0.28  0.29   0.3  0.31  0.32    33  0.34  0.3    0.36
    4     1     6    13    34    44    56    88   141   140   177   170   214   191   229   216   253   231   240   218   263   160   198   148   182     4   135    86    04    63
 0.38  0.39   0.4  0.41  0.42  0.43  0.44  0.45  0.46  0.47  0.48  0.49   0.5  0.51  0.52  0.53  0.54  0.55  0.56  0.57  0.58  0.59   0.6  0.61  0.62  0.6    0.64  0.65    5  0.67
   63    61    59    54    36    35    46    25    30    15    17    14    14    10    10     8    10    14     9     4     7     4     7     7     5     7     2     5
 0.68  0.69  0.71  0.73  0.74  0.75  0.76  0.78  0.85  0.91  0.93 1.005   1.1    85   105   115   125   135   145   155   165   175   185     1    15    22.    235   245     2   265
    3     2     1     1     1     1     2     1     1     1     1     1     1     1     6     3     3     1     4     5     2     1     5     4     1     4     1     4     5
  275   285   295   305   315   325   335   345   355   365   375   385   395   405   415   425   435   445   455   475   485   495    54   555   585   595     655     5   695
    3     5     3     4     4     2     7     9     1     2     2     2     2     1     4     2     2     4     2     3     3     2     2     2     2     4     1     3
  705   785   815   905   965
    2     1     1     1     1
> acid_crosstab <- table(df$fixed.acidity > median(df$fixed.acidity),
+                       df$volatile.acidity > median(df$volatile.acidity))
```



```
+                       df$volatile.acidity > median(df$volatile.acidity))
> print(acid_crosstab)

        FALSE TRUE
  FALSE  1381 1254
  TRUE   1285  978
> t.test(df$fixed.acidity, mu = mean(df$fixed.acidity))

        One Sample t-test

data:  df$fixed.acidity
t = 0, df = 4897, p-value = 1
alternative hypothesis: true mean is not equal to 6.854788
95 percent confidence interval:
 6.831149 6.878426
sample estimates:
mean of x
 6.854788

> t.test(df$volatile.acidity, mu = mean(df$volatil   idity))

        One Sample t-test

data:  df$volatile.acidity
t = 0, df = 4897, p-value = 1
alternative hypothesis: true mean is not      to 11.21666
95 percent confidence interval:
  9.31219 13.12113
sample estimates:
mean of x
 11.21666

> t.test(df$fixed.acidi    df$volatile.acid
        Welch Two Sampl    Test
data:  df$fixed.acidity and    olatile.acidity
t = -4.4897, df = 4898.5, p-v      = 7.295e-06
alternative hypothesis: true di      nce in means is not equal to 0
95 percen      ence interval:
```

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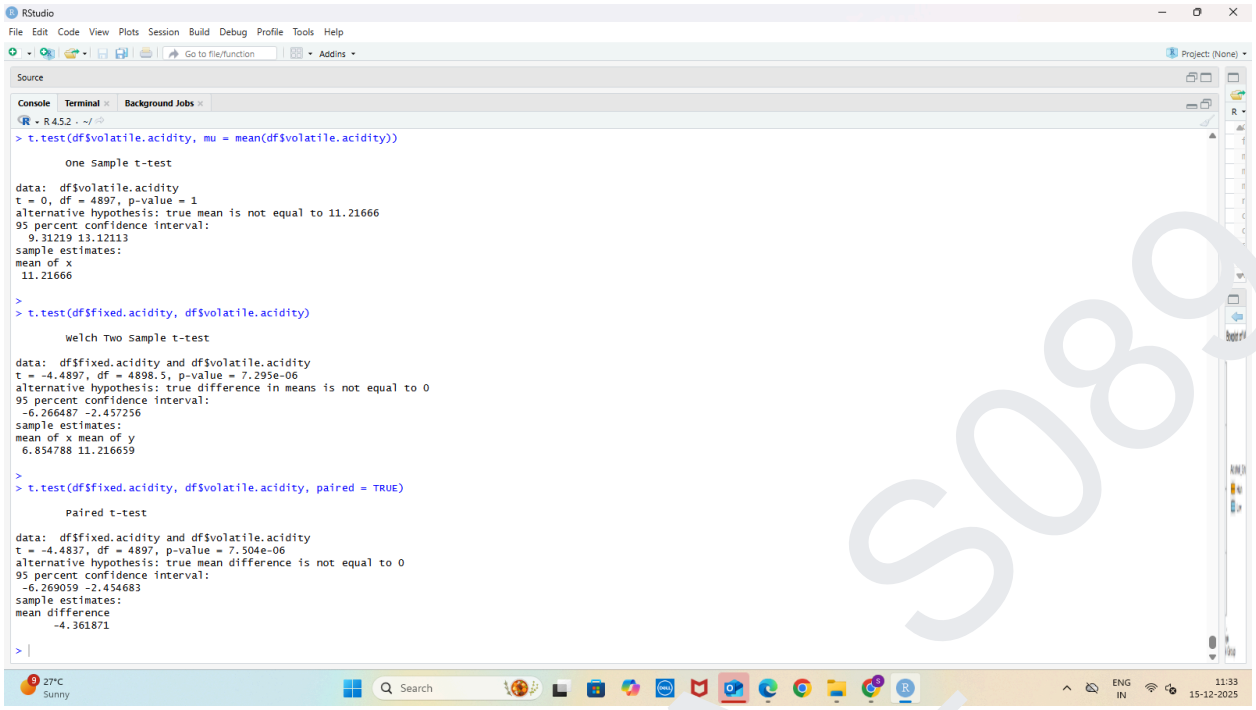
SHETH L.U.J AND SIR M.V COLLEGE
PRACTICAL NO: MODULE 2 (1 TO 6)



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