

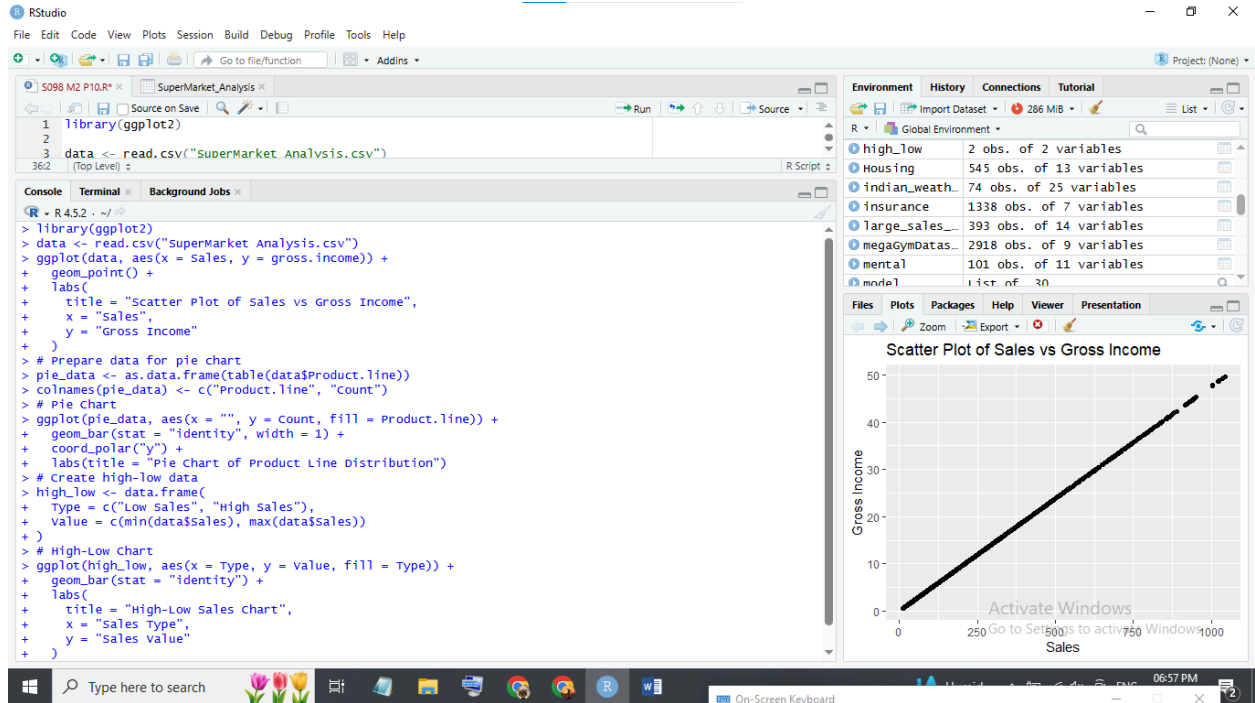
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Subject:-Data Analysis with SAS / SPSS /R

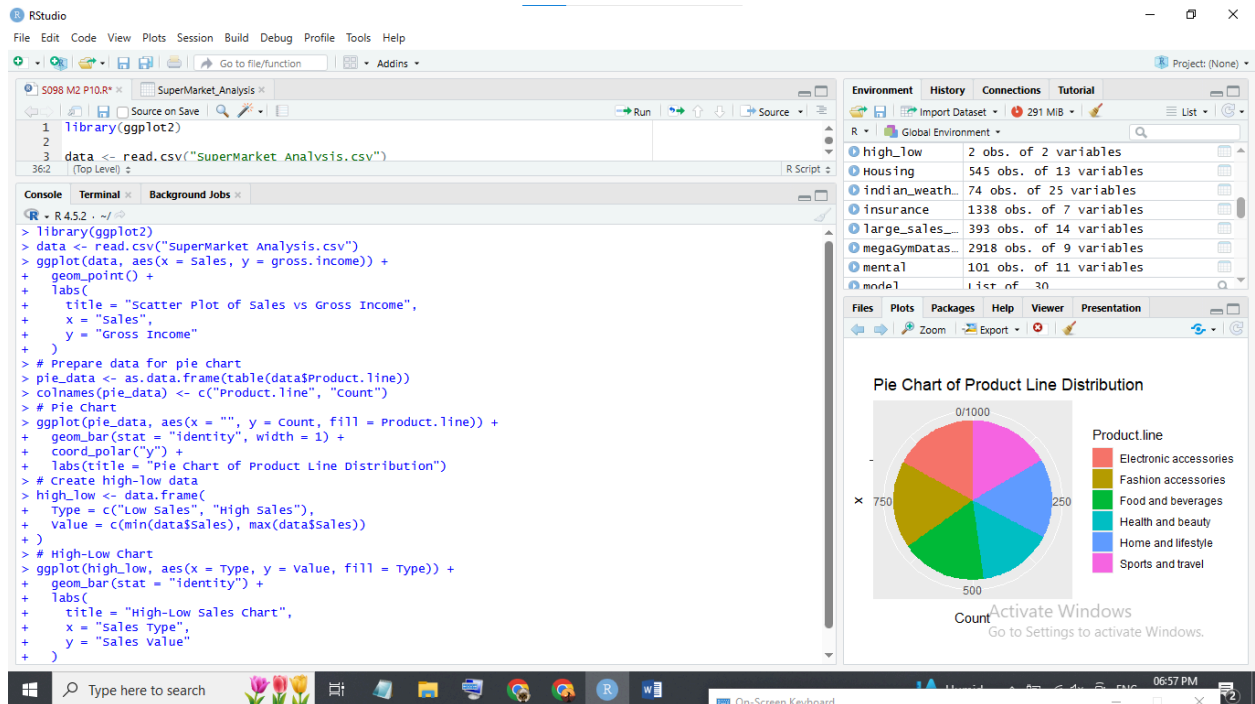
10 Creating graphical reports using ,ggplot2 (R).

Output:-

Scatter Plot:-



Pie Chart:-



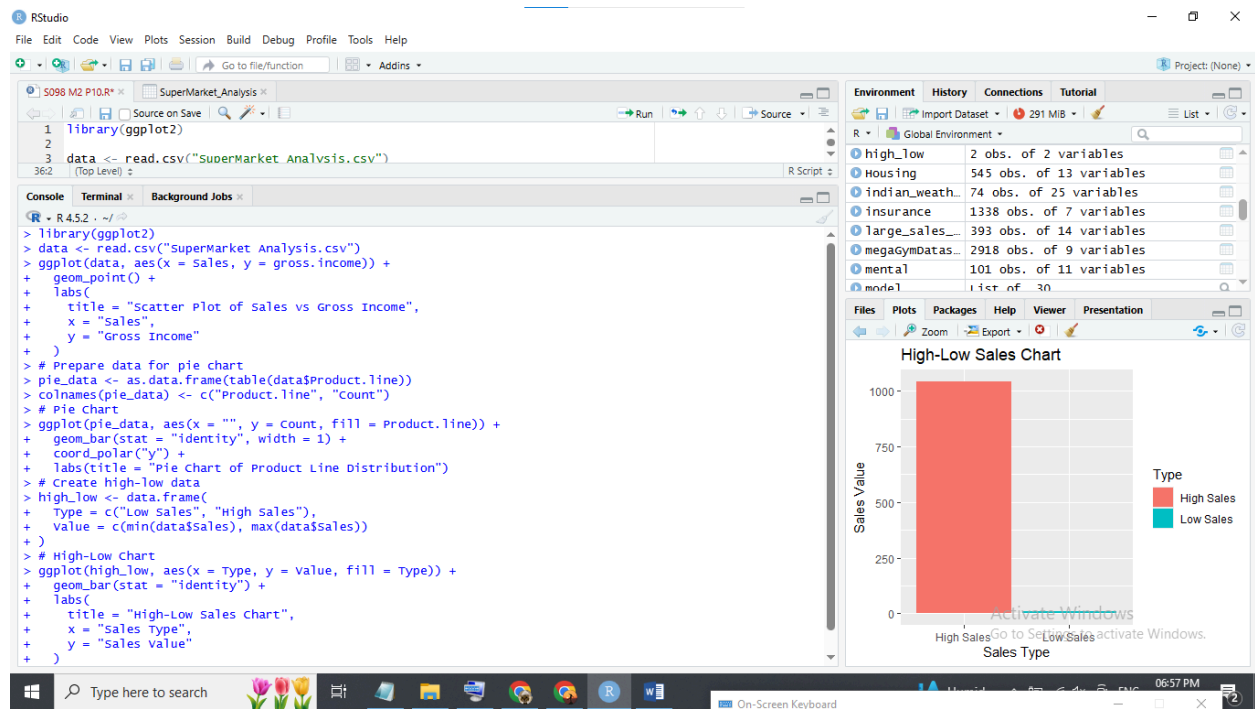
Vikas Pal

S098

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High-low Chart:-

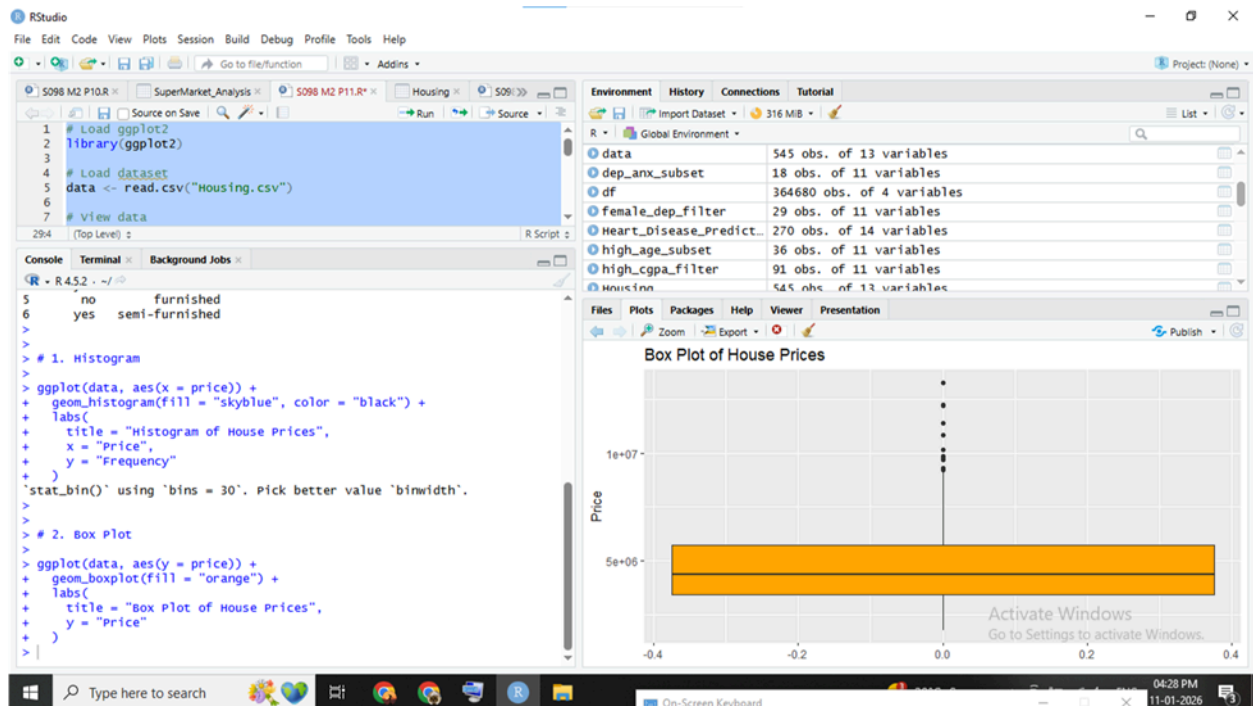
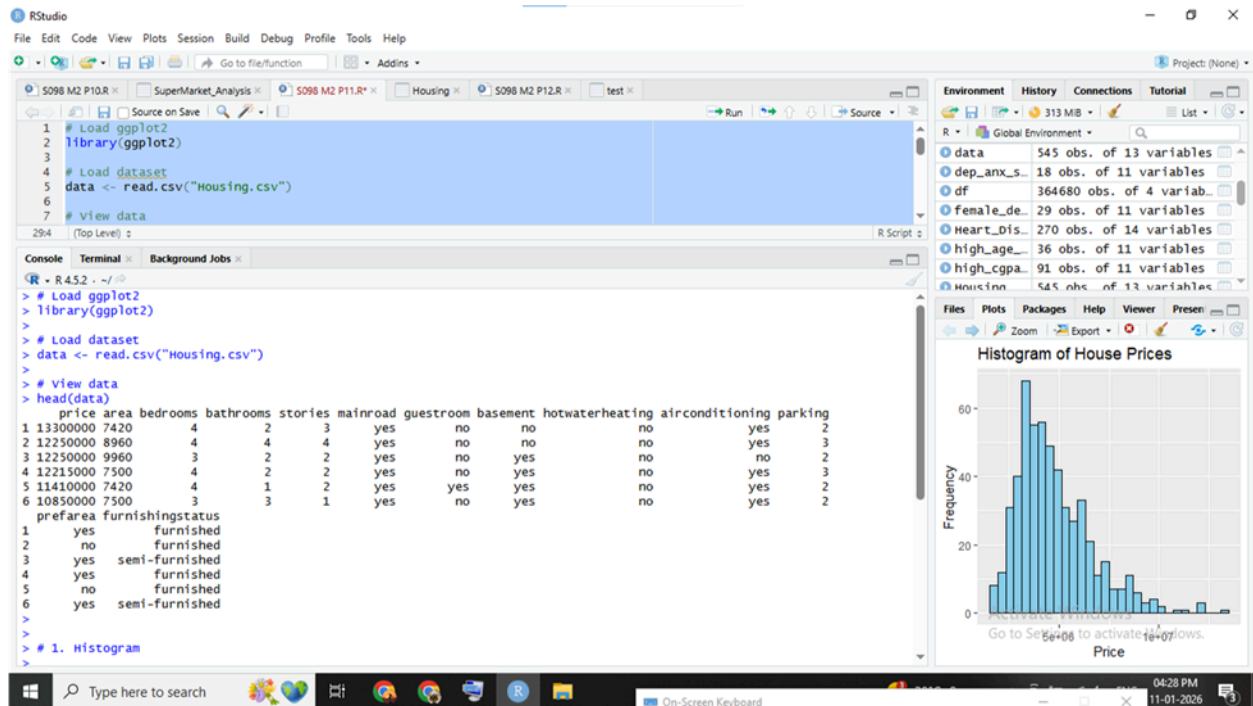


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11 Generating histograms and box plots using ggplot2 (R).

Output:-



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Subject:-Data Analysis with SAS / SPSS /R

12 Generating correlation matrices using cor() (R).

Output:-

The screenshot shows the RStudio interface with the following components:

- Source Editor:** Contains R code for loading and viewing a dataset named 'test.csv'.
- Console:** Displays the output of the R code, showing the structure of the data frame and the first few rows.
- Environment:** Lists the objects in the global environment, including 'HOUSING', 'indian_weat...', 'insurance', 'large_sales...', 'megaGymData...', 'mental', 'my_data', and 'numeric_data'.
- Files:** Shows the file explorer with various CSV files and folders.

```
# Load dataset
data <- read.csv("test.csv")

# View dataset
head(data)
str(data)
```

Console Output:

```
> # Load dataset
> data <- read.csv("test.csv")
> 
> # View dataset
> head(data)
  id battery_power blue clock_speed dual_sim fc four_g int_memory m_dep mobile_wt n_cores pc px_height
1  1      1043      1       1.8       1 14      0       5 0.1      193      3 16      226
2  2       841      1       0.5       1  4      0      61 0.8      191      5 12      746
3  3      1807      1       2.8       0  1      0      27 0.9      186      3  4     1270
4  4      1546      0       0.5      1 18      1      25 0.5       96      8 20      295
5  5      1434      0       1.4      0 11      1      49 0.5      108      6 18      749
6  6      1464      1       2.9       1  5      1      50 0.8      198      8  9      569

  px_width ram sc_h sc_w talk_time three_g touch_screen wifi
1  1412 3476 12  7      2      0      1 0 0
2   857 3895  6  0      7      1 0 0
3  1366 2396 17 10     10      0 1 1
4  1752 3893 10  0      7      1 1 0
5   810 1773 15  8      7      1 0 1
6   939 3506 10  7      3      1 1 1

> str(data)
'data.frame':   1000 obs. of  21 variables:
 $ id          : int  1 2 3 4 5 6 7 8 9 10 ...
 $ battery_power: int  1043 841 1807 1546 1434 1464 1718 833 1111 1520 ...
 $ blue         : int  1 1 1 0 0 1 0 0 1 0 ...
 $ clock_speed  : num  1.8 0.5 2.8 0.5 1.4 2.9 2.4 2.4 2.9 0.5 ...
 $ dual_sim     : int  1 1 0 1 0 1 0 1 0 ...
 $ fc           : int  1 1 1 0 0 1 0 0 1 ...
 $ four_g       : int  0 1 0 1 1 1 0 0 1 ...
 $ int_memory   : int  5 61 27 25 49 50 47 62 25 25 ...
 $ m_dep        : num  0.1 0.8 0.9 0.5 0.5 0.8 1 0.8 0.6 0.5 ...
 $ mobile_wt    : int  193 191 186 96 108 198 156 111 101 171 ...
 $ n_cores      : int  3 5 3 8 6 8 2 1 5 3 ...
 $ pc           : int  16 12 4 20 18 9 3 2 19 20 ...
 $ px_height    : int  226 746 1270 295 749 569 1283 1312 556 52 ...
 $ px_width     : int  1412 857 1366 1752 810 939 1374 1880 876 1009 ...
 $ ram          : int  3476 3895 2396 3893 1773 3506 3873 1495 3485 651 ...
 $ sc_h         : int  12 6 17 10 15 10 14 7 11 6 ...
 $ sc_w         : int  7 0 10 0 8 7 2 2 9 0 ...
 $ talk_time    : int  2 7 10 7 3 10 18 10 5 ...
 $ three_g      : int  0 1 0 1 1 0 0 1 1 ...
 $ touch_screen : int  1 0 1 1 0 1 0 1 0 ...
 $ wifi         : int  0 0 1 0 1 1 0 1 0 ...
```

The screenshot shows the RStudio interface with the following components:

- Source Editor:** Contains R code for selecting numeric columns and generating a correlation matrix.
- Console:** Displays the output of the R code, showing the structure of the data frame and the first few rows.
- Environment:** Lists the objects in the global environment, including 'HOUSING', 'indian_weat...', 'insurance', 'large_sales...', 'megaGymData...', 'mental', 'my_data', and 'numeric_data'.
- Files:** Shows the file explorer with various CSV files and folders.

```
# select only numeric columns
numeric_data <- data[sapply(data, is.numeric)]

# Generate correlation matrix
correlation_matrix <- cor(numeric_data)
```

Console Output:

```
$ battery_power: int  1043 841 1807 1546 1434 1464 1718 833 1111 1520 ...
$ blue          : int  1 1 1 0 0 1 0 0 1 0 ...
$ clock_speed   : num  1.8 0.5 2.8 0.5 1.4 2.9 2.4 2.4 2.9 0.5 ...
$ dual_sim      : int  1 1 0 1 0 1 0 1 0 ...
$ fc            : int  1 1 1 0 0 1 0 0 1 ...
$ four_g        : int  0 1 0 1 1 1 0 0 1 ...
$ int_memory    : int  5 61 27 25 49 50 47 62 25 25 ...
$ m_dep         : num  0.1 0.8 0.9 0.5 0.5 0.8 1 0.8 0.6 0.5 ...
$ mobile_wt     : int  193 191 186 96 108 198 156 111 101 171 ...
$ n_cores       : int  3 5 3 8 6 8 2 1 5 3 ...
$ pc            : int  16 12 4 20 18 9 3 2 19 20 ...
$ px_height     : int  226 746 1270 295 749 569 1283 1312 556 52 ...
$ px_width      : int  1412 857 1366 1752 810 939 1374 1880 876 1009 ...
$ ram           : int  3476 3895 2396 3893 1773 3506 3873 1495 3485 651 ...
$ sc_h          : int  12 6 17 10 15 10 14 7 11 6 ...
$ sc_w          : int  7 0 10 0 8 7 2 2 9 0 ...
$ talk_time     : int  2 7 10 7 3 10 18 10 5 ...
$ three_g       : int  0 1 0 1 1 0 0 1 1 ...
$ touch_screen  : int  1 0 1 1 0 1 0 1 0 ...
$ wifi          : int  0 0 1 0 1 1 0 1 0 ...
```

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RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function Addins

Project: (None)

Environment History Connections Tutorial

Global Environment

- HOUSING 343 obs. of 13 variables
- indian_weat... 74 obs. of 25 variables
- insurance 1338 obs. of 7 variables
- large_sales... 393 obs. of 14 variables
- megaGymData... 2918 obs. of 9 variables
- mental 101 obs. of 11 variables
- my_data 2500 obs. of 10 variables
- numeric_data 1000 obs. of 21 variables

Files Plots Packages Help Viewer Presentation

Home

File Name Size Modified

- S098 P5.R 596 B Nov 24, 2021
- S125 M2 P7.R 367 B Dec 21, 2021
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```
1 # Load dataset
2 data <- read.csv("test.csv")
3
4 # View dataset
5 head(data)
6 str(data)
7
```

Console

```
> correlation_matrix <- cor(numeric_data)
>
> # Display correlation matrix
> print(correlation_matrix)
```

	id	battery_power	blue	clock_speed	dual_sim	fc
id	1.0000000000	-0.0215114289	0.0004644277	0.0359170888	-0.0027208943	0.016933840
battery_power	-0.0215114289	1.0000000000	-0.0466096315	-0.0390754297	-0.0611708963	-0.007846110
blue	0.0004644277	-0.0466096315	1.0000000000	0.0347539970	-0.0111000991	-0.056063410
clock_speed	0.0359170888	-0.0390754297	0.0347539970	1.0000000000	-0.0124226539	0.010127218
dual_sim	-0.0027208943	-0.0611708963	-0.0111000991	-0.0124226539	1.0000000000	0.057606192
fc	0.016933840	-0.007846110	-0.056063410	0.010127218	0.057606192	1.0000000000
four_g	0.0309206471	-0.0425200594	-0.0011689937	-0.0246648231	0.0249068154	0.032832204
int_memory	-0.0140234070	0.0037509249	-0.0124163270	-0.0304868400	-0.0121578310	-0.006564568
m_dep	-0.0027944074	-0.0090648939	0.0183194381	0.0169946882	0.0217602256	0.020859314
mobile_wt	-0.0075411165	-0.0470646578	0.0235133680	-0.0141069129	-0.0017341884	0.018352697
n_cores	-0.0159345009	0.0257315582	0.0032828208	-0.0122469187	-0.0031290360	0.020827702
pc	0.0019685860	0.0128467064	-0.0252471248	0.0474691494	0.0739364180	0.659338498
px_height	-0.0250561723	0.0486468811	-0.0588100983	0.0172774418	0.0068419402	-0.017982400
px_width	-0.0121377560	0.0533653977	-0.0320535827	0.0705848351	0.0156095870	0.030549905
ram	-0.0434421522	-0.0323656392	0.0575699860	-0.0006496637	0.0481710716	-0.051996670
sc_h	-0.0119719018	-0.0556652209	0.0127796584	-0.0395030496	0.0062952549	0.045157825
sc_w	-0.0029181267	-0.0239047827	0.0042230804	-0.0271376160	-0.0020644597	0.006115145
talk_time	0.0308072019	-0.0154660124	-0.0319952096	-0.0787968458	0.0043902542	-0.051458197
three_g	0.0495709892	0.0315141655	0.0135298590	-0.0214064414	0.006895838	-0.011121045
touch_screen	0.0397679064	-0.0101378408	-0.0600307436	0.0618927650	0.0340196691	0.015467061
wifi	0.0366434123	-0.0004144844	0.0255675984	-0.0485931165	0.0315453283	-0.060372737

RStudio

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Project: (None)

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1 # Load dataset
2 data <- read.csv("test.csv")
3
4 # View dataset
5 head(data)
6 str(data)
7
```

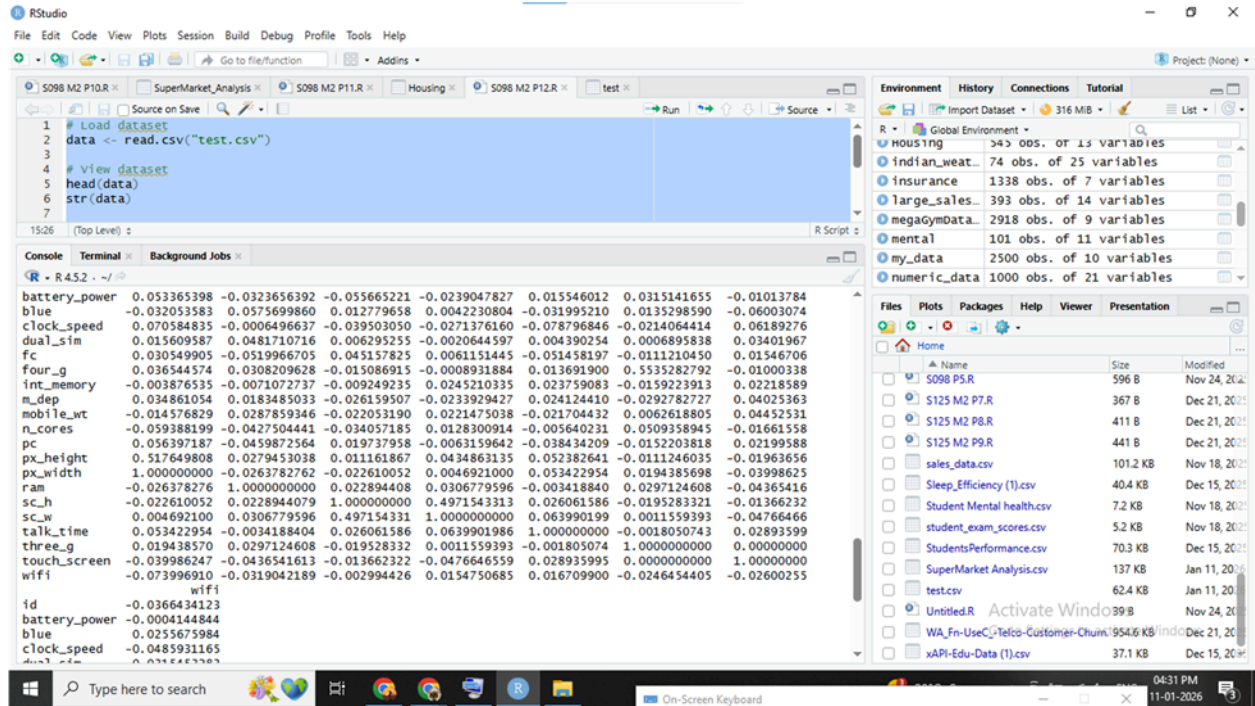
Console

```
> correlation_matrix <- cor(numeric_data)
>
> # Display correlation matrix
> print(correlation_matrix)
```

	id	battery_power	blue	clock_speed	dual_sim	fc	four_g	int_memory	m_dep	mobile_wt	n_cores	pc	px_height
id	1.0000000000	-0.0215114289	0.0004644277	0.0359170888	-0.0027208943	0.016933840	0.0309206471	-0.0140234070	-0.0027944074	-0.0075411165	-0.0159345009	0.0019685860	-0.0250561723
battery_power	-0.0215114289	1.0000000000	-0.0466096315	-0.0390754297	-0.0611708963	-0.007846110	-0.0425200594	0.0037509249	-0.0090648939	-0.0470646578	0.0257315582	0.0128467064	0.0486468811
blue	0.0004644277	-0.0466096315	1.0000000000	0.0347539970	-0.0111000991	-0.056063410	-0.0304868400	-0.0124163270	0.0183194381	0.0235133680	-0.0141069129	-0.0017341884	-0.0588100983
clock_speed	0.0359170888	-0.0390754297	0.0347539970	1.0000000000	-0.0124226539	0.010127218	-0.0246648231	-0.0304868400	0.0169946882	0.0474691494	-0.0031290360	0.0739364180	0.0068419402
dual_sim	-0.0027208943	-0.0611708963	-0.0111000991	-0.0124226539	1.0000000000	0.057606192	0.0249068154	-0.0121578310	0.0217602256	0.0068419402	-0.0031290360	0.0739364180	0.0068419402
fc	0.016933840	-0.007846110	-0.056063410	0.010127218	0.057606192	1.0000000000	0.032832204	-0.006564568	0.020859314	-0.017982400	-0.0031290360	0.659338498	-0.017982400
four_g	0.0309206471	-0.0425200594	-0.0011689937	-0.0246648231	0.0249068154	0.032832204	1.0000000000	-0.0374884991	-0.0090648939	-0.0470646578	0.0257315582	0.0128467064	0.0486468811
int_memory	-0.0140234070	0.0037509249	-0.0124163270	-0.0304868400	-0.0121578310	-0.006564568	-0.0374884991	1.0000000000	-0.0090648939	-0.0470646578	0.0257315582	0.0128467064	0.0486468811
m_dep	-0.0027944074	-0.0090648939	0.0183194381	0.0169946882	0.0217602256	0.020859314	-0.0090648939	-0.0090648939	1.0000000000	-0.0470646578	0.0257315582	0.0128467064	0.0486468811
mobile_wt	-0.0075411165	-0.0470646578	0.0235133680	-0.0141069129	-0.0017341884	0.018352697	0.0235133680	0.0235133680	-0.0141069129	1.0000000000	-0.0470646578	0.0257315582	0.0128467064
n_cores	-0.0159345009	0.0257315582	0.0032828208	-0.0122469187	-0.0031290360	0.020827702	0.0032828208	0.0032828208	-0.0122469187	-0.0031290360	1.0000000000	-0.0470646578	0.0257315582
pc	0.0019685860	0.0128467064	-0.0252471248	0.0474691494	0.0739364180	0.659338498	-0.0252471248	-0.0252471248	0.0474691494	0.0739364180	-0.0252471248	1.0000000000	0.659338498
px_height	-0.0250561723	0.0486468811	-0.0588100983	0.0172774418	0.0068419402	-0.017982400	0.0486468811	0.0486468811	-0.0588100983	0.0172774418	0.0068419402	-0.017982400	1.0000000000
px_width	-0.0121377560	0.0533653977	-0.0320535827	0.0705848351	0.0156095870	0.030549905	0.0533653977	0.0533653977	-0.0320535827	0.0705848351	0.0156095870	0.030549905	0.030549905
ram	-0.0434421522	-0.0323656392	0.0575699860	-0.0006496637	0.0481710716	-0.051996670	-0.0323656392	-0.0323656392	0.0575699860	-0.0006496637	0.0481710716	-0.051996670	-0.051996670
sc_h	-0.0119719018	-0.0556652209	0.0127796584	-0.0395030496	0.0062952549	0.045157825	-0.0556652209	-0.0556652209	0.0127796584	-0.0395030496	0.0062952549	0.045157825	0.045157825
sc_w	-0.0029181267	-0.0239047827	0.0042230804	-0.0271376160	-0.0020644597	0.006115145	-0.0239047827	-0.0239047827	0.0042230804	-0.0271376160	-0.0020644597	0.006115145	0.006115145
talk_time	0.0308072019	-0.0154660124	-0.0319952096	-0.0787968458	0.0043902542	-0.051458197	-0.0154660124	-0.0154660124	-0.0319952096	-0.0787968458	0.0043902542	-0.051458197	-0.051458197
three_g	0.0495709892	0.0315141655	0.0135298590	-0.0214064414	0.006895838	-0.011121045	0.0315141655	0.0315141655	0.0135298590	-0.0214064414	0.006895838	-0.011121045	-0.011121045
touch_screen	0.0397679064	-0.0101378408	-0.0600307436	0.0618927650	0.0340196691	0.015467061	-0.0101378408	-0.0101378408	-0.0600307436	0.0618927650	0.0340196691	0.015467061	0.015467061
wifi	0.0366434123	-0.0004144844	0.0255675984	-0.0485931165	0.0315453283	-0.060372737	0.0366434123	0.0366434123	-0.0004144844	0.0255675984	-0.0485931165	0.0315453283	-0.060372737

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Subject:-Data Analysis with SAS / SPSS /R



RStudio

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Project: (None)

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Files Plots Packages Help Viewer Presentation

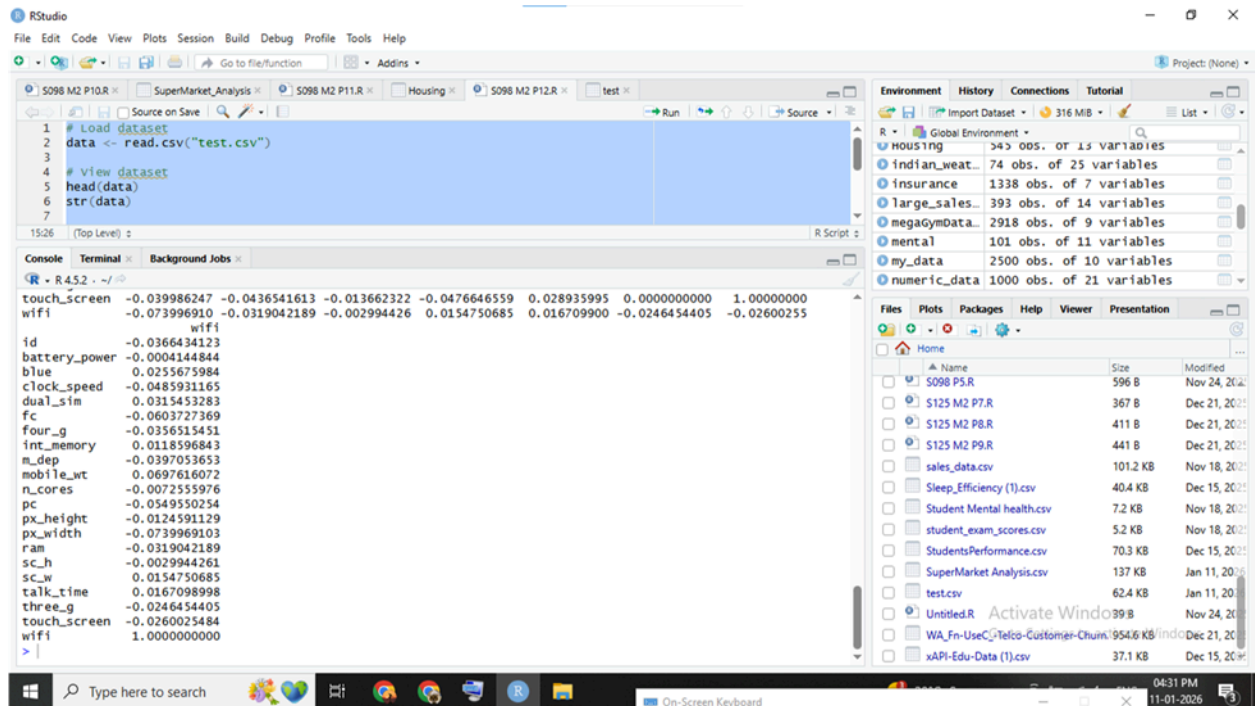
Home

Name	Size	Modified
S098 P5.R	596 B	Nov 24, 2024
S125 M2 P7.R	367 B	Dec 21, 2025
S125 M2 P8.R	411 B	Dec 21, 2025
S125 M2 P9.R	441 B	Dec 21, 2025
sales_data.csv	101.2 KB	Nov 18, 2025
Sleep_Efficiency (1).csv	40.4 KB	Dec 15, 2025
Student Mental health.csv	7.2 KB	Nov 18, 2025
student_exam_scores.csv	5.2 KB	Nov 18, 2025
StudentsPerformance.csv	70.3 KB	Dec 15, 2025
SuperMarket Analysis.csv	137 KB	Jan 11, 2026
test.csv	62.4 KB	Jan 11, 2026
Untitled.R	39 B	Nov 24, 2025
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```
1 # Load dataset
2 data <- read.csv("test.csv")
3
4 # View dataset
5 head(data)
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7
```

Console

```
R - R 4.5.2 - ~/
battery_power -0.053365398 -0.0323656392 -0.055665221 -0.0239047827 0.015546012 0.0315141655 -0.01013784
blue -0.032053583 -0.0575699860 -0.012779658 -0.0042230804 -0.031995210 0.0135298590 -0.06003074
clock_speed -0.070584835 -0.0006496637 -0.039503050 -0.0271376160 -0.078796846 -0.0214064414 0.06189276
dual_sim 0.015609587 0.0481710716 0.006295255 -0.0020644597 0.004390254 0.0006895838 0.03401967
fc 0.0305449905 -0.0519966705 -0.041517825 -0.0061151445 -0.051458197 -0.0111210450 0.01546706
four_g 0.036544574 0.0308209628 -0.015086915 -0.0008931884 0.013691900 0.5535282792 -0.01000338
int_memory -0.003876535 -0.0071072737 -0.009249235 -0.0245210335 0.023759083 -0.0159223913 0.02218589
m_dep 0.034861054 0.0183485033 -0.026159507 -0.0233929427 0.024124410 -0.0292782727 0.04025363
mobile_wt -0.014576829 0.0287859346 -0.022053190 0.0221475038 -0.021704432 0.0062618805 0.04452531
n_cores -0.059388199 -0.0427504441 -0.034057185 0.0128300914 -0.005640231 0.0509358945 -0.01661558
pc 0.056397187 -0.0459872564 0.019737958 -0.0063159642 -0.038434209 -0.0152203818 0.02199588
px_height 0.517649808 0.0279453038 0.011161867 0.0434863135 0.052382641 -0.0111246035 -0.01963656
px_width 1.000000000 -0.0263782762 -0.022610052 0.0046921000 0.053422954 0.0194385698 -0.03998625
ram -0.026378276 1.0000000000 0.022894408 0.0306779596 -0.003418840 0.0297124608 -0.04365416
sc_h -0.022610052 0.0228944079 1.000000000 0.4971543313 0.026061586 -0.0195283321 -0.01366232
sc_w 0.004692100 0.0306779596 0.497154331 1.0000000000 0.063990199 0.0011559393 -0.04766466
talk_time 0.053422954 -0.0034188404 0.026061586 0.0639901986 1.0000000000 -0.0018050743 0.02893599
three_g 0.019438570 0.0297124608 -0.019528332 0.0011559393 -0.001805074 1.0000000000 0.00000000
touch_screen -0.039986247 -0.0436541613 -0.013662322 -0.0476646559 0.028935995 0.0000000000 1.00000000
wifi -0.073996910 -0.0319042189 -0.002994426 0.0154750685 0.016709900 -0.0246454405 -0.02600255
```



RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function Addins

Project: (None)

Environment History Connections Tutorial

R - Global Environment

- HOUSING 345 obs. of 13 variables
- indian_weat... 74 obs. of 25 variables
- insurance 1338 obs. of 7 variables
- large_sales... 393 obs. of 14 variables
- megaGymData... 2918 obs. of 9 variables
- mental 101 obs. of 11 variables
- my_data 2500 obs. of 10 variables
- numeric_data 1000 obs. of 21 variables

Files Plots Packages Help Viewer Presentation

Home

Name	Size	Modified
S098 P5.R	596 B	Nov 24, 2024
S125 M2 P7.R	367 B	Dec 21, 2025
S125 M2 P8.R	411 B	Dec 21, 2025
S125 M2 P9.R	441 B	Dec 21, 2025
sales_data.csv	101.2 KB	Nov 18, 2025
Sleep_Efficiency (1).csv	40.4 KB	Dec 15, 2025
Student Mental health.csv	7.2 KB	Nov 18, 2025
student_exam_scores.csv	5.2 KB	Nov 18, 2025
StudentsPerformance.csv	70.3 KB	Dec 15, 2025
SuperMarket Analysis.csv	137 KB	Jan 11, 2026
test.csv	62.4 KB	Jan 11, 2026
Untitled.R	39 B	Nov 24, 2025
WA_Fn-UseC-Telco-Customer-Churn	954.6 KB	Dec 21, 2025
xAPI-Edu-Data (1).csv	37.1 KB	Dec 15, 2025

```
1 # Load dataset
2 data <- read.csv("test.csv")
3
4 # View dataset
5 head(data)
6 str(data)
7
```

Console

```
R - R 4.5.2 - ~/
touch_screen -0.039986247 -0.0436541613 -0.013662322 -0.0476646559 0.028935995 0.0000000000 1.00000000
wifi -0.073996910 -0.0319042189 -0.002994426 0.0154750685 0.016709900 -0.0246454405 -0.02600255
```