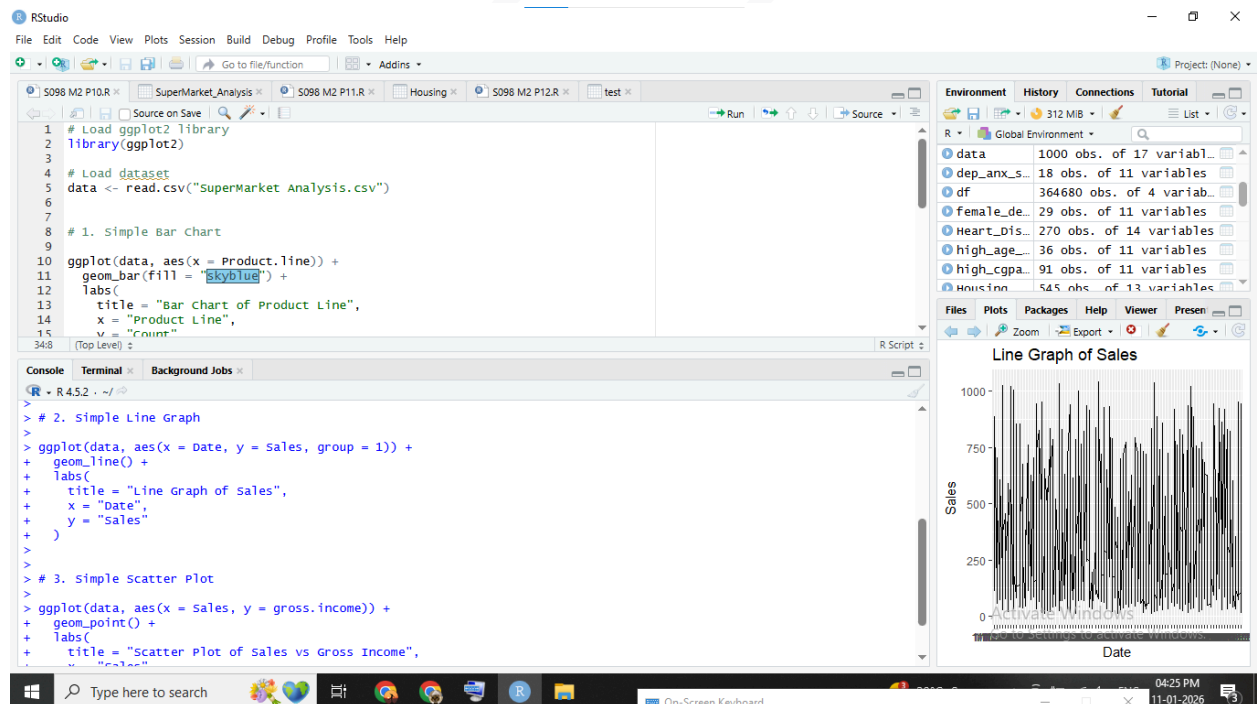
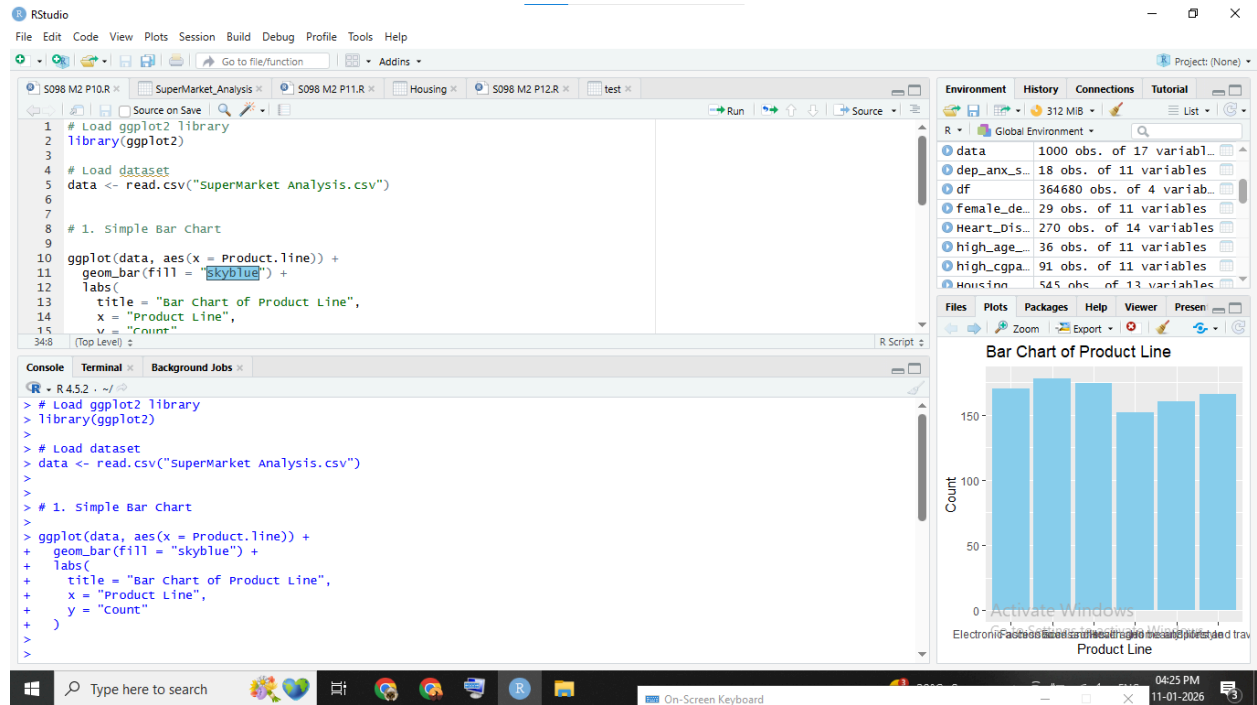


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Subject:-Data Analysis with SAS / SPSS /R

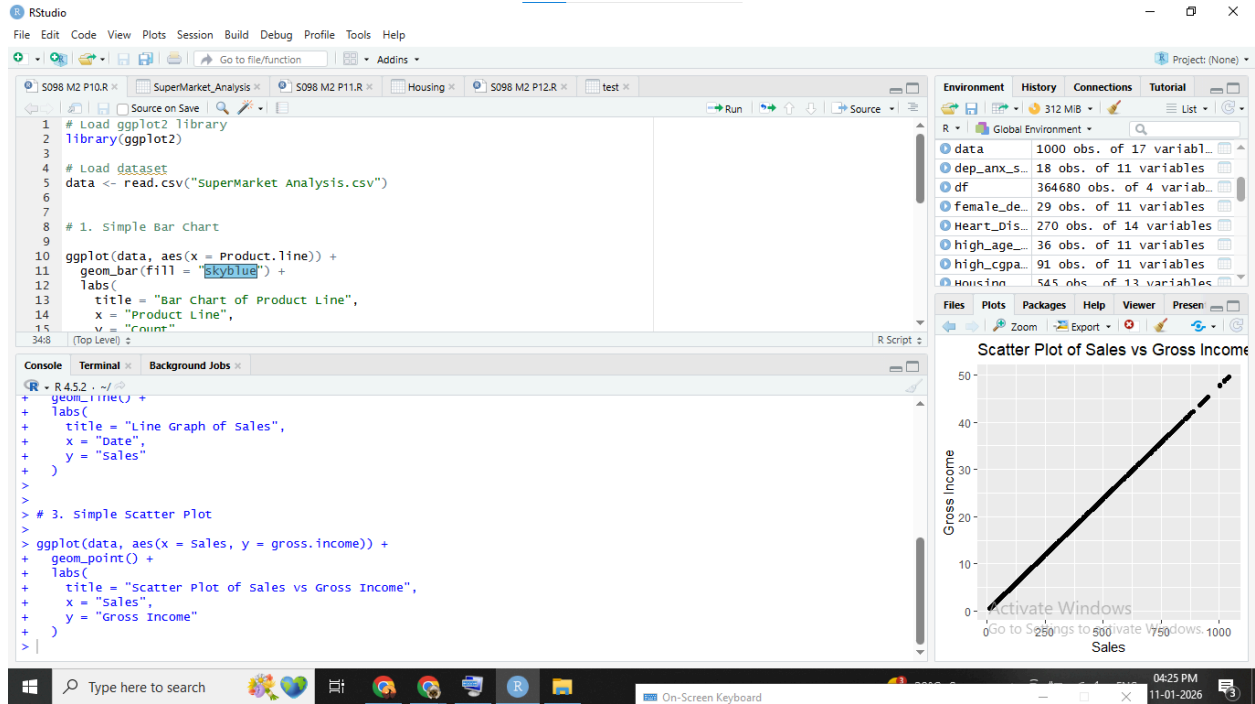
10 Creating graphical reports using ,ggplot2 (R).

OUTPUT:-



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Subject:-Data Analysis with SAS / SPSS /R

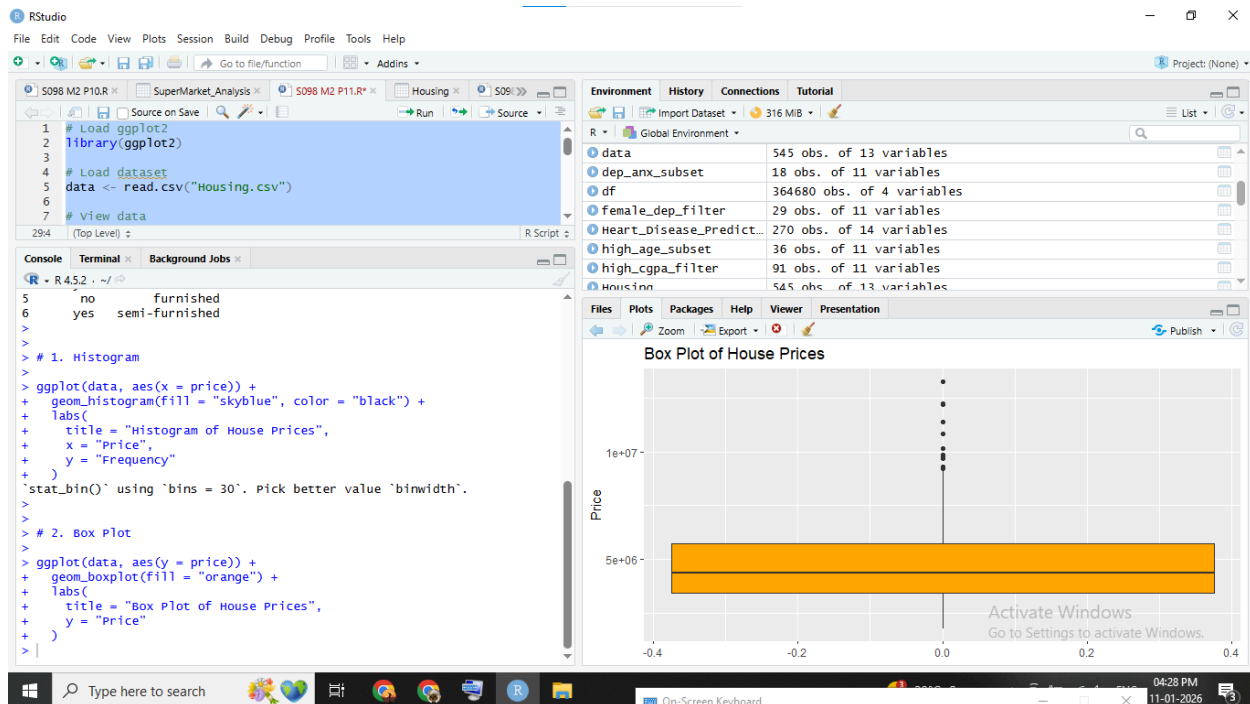
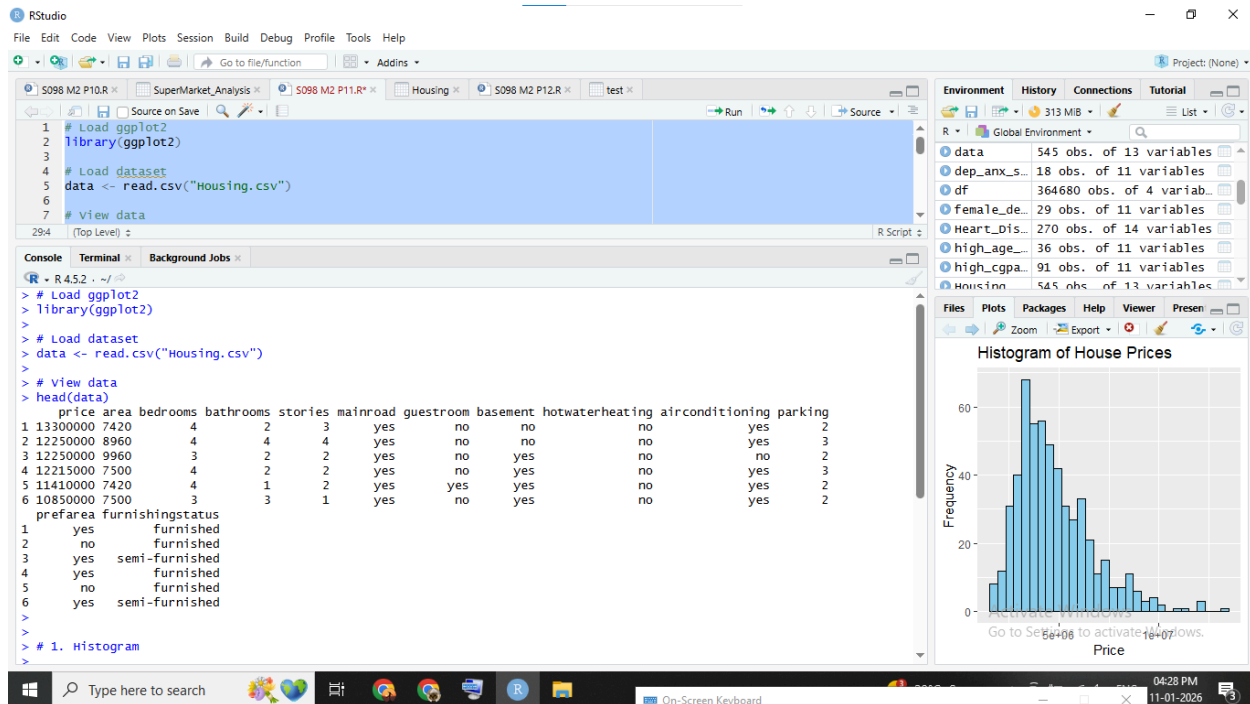


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Subject:-Data Analysis with SAS / SPSS /R

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. The script editor contains the following code:

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

The console output shows the first 6 rows of the dataset:

```
R - R 4.5.2 ~ /
> # 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 1 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
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 14 4 1 18 11 5 1 0 9 1 ...
 $ four_g : int 0 1 0 1 1 1 0 0 1 0 ...
 $ 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 7 3 10 18 10 5 ...
 $ three_g : int 0 1 0 1 1 1 0 0 1 1 ...
 $ touch_screen: int 1 0 1 1 0 1 0 1 1 0 ...
 $ wifi : int 0 0 1 0 1 1 0 1 0 1 ...
```

The Environment pane on the right shows the loaded data objects:

| 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 |
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| WA_Fn-UseC-Telco-Customer-Churn | 954.6 KB | Dec 21, 2025 |
| xAPI-Edu-Data (1).csv | 37.1 KB | Dec 15, 2025 |

The script editor now includes the following code to generate a correlation matrix:

```
1 # Load dataset
2 data <- read.csv("test.csv")
3
4 # View dataset
5 head(data)
6 str(data)
7
8 # select only numeric columns
9 numeric_data <- data[sapply(data, is.numeric)]
10
11 # Generate correlation matrix
12 correlation_matrix <- cor(numeric_data)
```

The console output shows the structure of the numeric data and the successful generation of the correlation matrix:

```
R - R 4.5.2 ~ /
> # select only numeric columns
> numeric_data <- data[sapply(data, is.numeric)]
>
> # Generate correlation matrix
> correlation_matrix <- cor(numeric_data)
```

The Environment pane remains the same as in the previous screenshot.

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Subject:-Data Analysis with SAS / SPSS /R

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function Addins

Project: (None)

```
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 | -0.0323653692 | 0.0575699860 | -0.0006496637 | 0.0481710716 | -0.051996670 |
| sc_h | -0.019719018 | -0.0506522098 | 0.0127796584 | -0.0396030496 | 0.0062952549 | 0.045157825 |
| sc_w | 0.0023818267 | -0.0239047827 | 0.0042230804 | -0.0271376160 | -0.0020644597 | 0.006115145 |
| talk_time | 0.0308072019 | 0.0155460124 | -0.0319952096 | -0.0787968458 | 0.0043902542 | -0.051458197 |
| three_g | 0.0495709892 | 0.0315141655 | 0.0135298590 | -0.0214064414 | 0.0006895838 | -0.011121045 |
| touch_screen | 0.0396769064 | -0.0101378408 | -0.0600307436 | 0.0618927650 | 0.0340196691 | 0.015467061 |
| wifi | 0.0366434123 | -0.0004148444 | 0.0255675984 | -0.0485931165 | 0.0315453283 | -0.060372737 |

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RStudio

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Go to file/function Addins

Project: (None)

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

Console

```
wifi -0.0366434123 -0.0004148444 0.0255675984 -0.0485931165 0.0315453283 -0.060372737
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 -0.0323653692 0.0575699860 -0.0006496637 0.0481710716 -0.051996670
sc_h -0.019719018 -0.0506522098 0.0127796584 -0.0396030496 0.0062952549 0.045157825
sc_w 0.0023818267 -0.0239047827 0.0042230804 -0.0271376160 -0.0020644597 0.006115145
talk_time 0.0308072019 0.0155460124 -0.0319952096 -0.0787968458 0.0043902542 -0.051458197
three_g 0.0495709892 0.0315141655 0.0135298590 -0.0214064414 0.0006895838 -0.011121045
touch_screen 0.0396769064 -0.0101378408 -0.0600307436 0.0618927650 0.0340196691 0.015467061
id -0.012137756 -0.0434421522 -0.011971902 0.0029181267 0.030807202 0.0495709892 0.03976791
```

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MVLU COLLEGE

Subject:-Data Analysis with SAS / SPSS /R

RStudio

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Go to file/function Addins

Project: (None)

Environment History Connections Tutorial

R - 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

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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 Terminal Background Jobs

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 | 0.030544905 | -0.0319966705 | 0.045157825 | -0.0061151445 | -0.051458197 | -0.0112104050 | -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 | 0.01161867 | 0.0434863135 | 0.052382641 | -0.011246035 | -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 | 1.0000000000 | 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 | 0.063990199 | 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 |
| id | -0.0366434123 | | | | | | |
| battery_power | -0.0004144844 | | | | | | |
| blue | 0.0255675984 | | | | | | |
| clock_speed | -0.0485931165 | | | | | | |
| dual_sim | 0.0315453283 | | | | | | |
| fc | -0.0603727369 | | | | | | |
| four_g | -0.0356515451 | | | | | | |
| int_memory | 0.0118596843 | | | | | | |
| m_dep | -0.0397053653 | | | | | | |
| mobile_wt | 0.0697616072 | | | | | | |
| n_cores | -0.0072555976 | | | | | | |
| pc | -0.0549550254 | | | | | | |
| px_height | -0.0124591129 | | | | | | |
| px_width | -0.0739969103 | | | | | | |
| ram | -0.0319042189 | | | | | | |
| sc_h | -0.0029944261 | | | | | | |
| sc_w | 0.0154750685 | | | | | | |
| talk_time | 0.0167098998 | | | | | | |
| three_g | -0.0246454405 | | | | | | |
| touch_screen | -0.0260025484 | | | | | | |
| wifi | 1.0000000000 | | | | | | |

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 343 obs. of 13 variables
- indian_weat... 74 obs. of 25 variables
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- mental 101 obs. of 11 variables
- my_data 2500 obs. of 10 variables
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Files Plots Packages Help Viewer Presentation

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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 Terminal Background Jobs

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 |
| id | -0.0366434123 | | | | | | |
| battery_power | -0.0004144844 | | | | | | |
| blue | 0.0255675984 | | | | | | |
| clock_speed | -0.0485931165 | | | | | | |
| dual_sim | 0.0315453283 | | | | | | |
| fc | -0.0603727369 | | | | | | |
| four_g | -0.0356515451 | | | | | | |
| int_memory | 0.0118596843 | | | | | | |
| m_dep | -0.0397053653 | | | | | | |
| mobile_wt | 0.0697616072 | | | | | | |
| n_cores | -0.0072555976 | | | | | | |
| pc | -0.0549550254 | | | | | | |
| px_height | -0.0124591129 | | | | | | |
| px_width | -0.0739969103 | | | | | | |
| ram | -0.0319042189 | | | | | | |
| sc_h | -0.0029944261 | | | | | | |
| sc_w | 0.0154750685 | | | | | | |
| talk_time | 0.0167098998 | | | | | | |
| three_g | -0.0246454405 | | | | | | |
| touch_screen | -0.0260025484 | | | | | | |
| wifi | 1.0000000000 | | | | | | |