

# MVLU COLLEGE

## Subject:-Data Analysis with SAS / SPSS / R

Aim:- Exploring data: View() or print() (R).

`install.packages(c("readr", "psych"))`

The screenshot shows the RStudio interface. In the top-left pane, a script named 'S098 P3.R' contains the command `install.packages(c("readr", "psych"))`. The console pane below it displays the output of the command, which includes a warning about Rtools being required for package building, the URLs from which packages were downloaded, and a confirmation message that the download and unpacking was successful. The right-hand pane shows the Global Environment, which is currently empty. A floating On-Screen Keyboard is visible in the center-right area. The taskbar at the bottom shows the date and time as Nov 24, 2025, 5:56 PM.

```
install.packages(c("readr", "psych"))
[1] "https://cran.rstudio.com/bin/windows/Rtools"
[2] "https://cran.rstudio.com/bin/windows/contrib/4.5/readr_2.1.6.zip"
[3] "https://cran.rstudio.com/bin/windows/contrib/4.5/psych_2.5.6.zip"
[4] "C:\Users\Pal\AppData\Local\Temp\RtmpK6GWLQ\downloaded_packages"
```

`library(readr)`

This screenshot is similar to the previous one but shows the command `library(readr)` instead of its installation. The console output indicates that the package was successfully loaded. The rest of the environment is identical to the first screenshot, including the empty Global Environment and the floating On-Screen Keyboard. The taskbar at the bottom shows the date and time as Nov 24, 2025, 5:57 PM.

```
library(readr)
```

# MVLU COLLEGE

## Subject:-Data Analysis with SAS / SPSS /R

library(psych)

The screenshot shows the RStudio interface. In the top-left pane, a script named 'S098 P3.R' contains the following R code:

```
install.packages(c("readr", "psych"))
library(readr)
library(psych)
```

In the bottom-left pane, the console output shows the installation of the 'psych' package:

```
R - R 4.5.2 - ~/> > install.packages(c("readr", "psych"))
WARNING: Rtools is required to build R packages but is not currently installed. Please download and install the appropriate version of Rtools before proceeding:
https://cran.rstudio.com/bin/windows/Rtools/
Installing packages into 'C:/Users/Pal/AppData/Local/r/win-library/4.5'
(as 'lib' is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.5/readr_2.1.6.zip'
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.5/psych_2.5.6.zip'
package 'readr' successfully unpacked and MD5 sums checked
package 'psych' successfully unpacked and MD5 sums checked
The downloaded binary packages are in
  C:/Users/Pal/AppData/Local/Temp/RtmpK6GWLQ/downloaded_packages
> library(readr)
> library(psych)
```

The top-right pane shows the 'Environment' tab of the global environment, which is currently empty.

The bottom-right pane shows the Windows taskbar with the date and time as 05:58 PM 24-11-2025.

my\_data <- read.csv("car\_price\_prediction.csv")

The screenshot shows the RStudio interface. In the top-left pane, a script named 'S098 P3.R' contains the following R code:

```
install.packages(c("readr", "psych"))
library(readr)
library(psych)
my_data <- read.csv("car_price_prediction.csv")

```

In the bottom-left pane, the console output shows the reading of the 'car\_price\_prediction.csv' file:

```
R - R 4.5.2 - ~/> > install.packages(c("readr", "psych"))
WARNING: Rtools is required to build R packages but is not currently installed. Please download and install the appropriate version of Rtools before proceeding:
https://cran.rstudio.com/bin/windows/Rtools/
Installing packages into 'C:/Users/Pal/AppData/Local/r/win-library/4.5'
(as 'lib' is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.5/readr_2.1.6.zip'
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.5/psych_2.5.6.zip'
package 'readr' successfully unpacked and MD5 sums checked
package 'psych' successfully unpacked and MD5 sums checked
The downloaded binary packages are in
  C:/Users/Pal/AppData/Local/Temp/RtmpK6GWLQ/downloaded_packages
> library(readr)
> library(psych)
> my_data <- read.csv("car_price_prediction.csv")
> |
```

The top-right pane shows the 'Data' tab of the global environment, displaying the 'my\_data' dataset with 2500 observations and 10 variables.

The bottom-right pane shows the Windows taskbar with the date and time as 06:02 PM 24-11-2025.

# MVLU COLLEGE

## Subject:-Data Analysis with SAS / SPSS /R

`head(my_data)`

RStudio interface showing the head of the `my_data` dataset. The code editor shows the following R script:

```

1 install.packages(c("readr", "psych"))
2 library(readr)
3 library(psych)
4 my_data <- read.csv("car_price_prediction.csv")
5 head(my_data)
6
7
8

```

The console output shows the loading of packages and the head of the dataset:

```

R - R4.52 - ./R
> install.packages(c("readr", "psych"))

WARNING: Rtools is required to build R packages but is not currently installed. Please download and install the appropriate version of Rtools before proceeding:

https://cran.rstudio.com/bin/windows/Rtools

Installing packages into 'C:/Users/Pal/AppData/Local/R/win-library/4.5'
(as 'lib' is unspecified)

trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.5/readr_2.1.6.zip'
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.5/psych_2.5.6.zip'

package 'readr' successfully unpacked and MD5 sums checked
package 'psych' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
  C:/Users/Pal/AppData/Local/Temp/RtmpK6GWLQ/downloaded_packages
> library(readr)
> library(psych)
> my_data <- read.csv("car_price_prediction.csv")
>

```

The Data View pane shows the first few rows of the `my_data` dataset, which contains 2500 observations and 10 variables.

`tail(my_data)`

RStudio interface showing the tail of the `my_data` dataset. The code editor shows the same R script as the previous screenshot.

```

R - R4.52 - ./R
> install.packages(c("readr", "psych"))

WARNING: Rtools is required to build R packages but is not currently installed. Please download and install the appropriate version of Rtools before proceeding:

https://cran.rstudio.com/bin/windows/Rtools

Installing packages into 'C:/Users/Pal/AppData/Local/R/win-library/4.5'
(as 'lib' is unspecified)

trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.5/readr_2.1.6.zip'
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.5/psych_2.5.6.zip'

package 'readr' successfully unpacked and MD5 sums checked
package 'psych' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
  C:/Users/Pal/AppData/Local/Temp/RtmpK6GWLQ/downloaded_packages
> library(readr)
> library(psych)
> my_data <- read.csv("car_price_prediction.csv")
>
> my_data <- read.csv("car_price_prediction.csv")
> tail(my_data)

```

The Data View pane shows the last few rows of the `my_data` dataset. The table includes columns: Car.ID, Brand, Year, Engine.Size, Fuel.Type, Transmission, Mileage, Condition, Price, Model, and used.90378.98.E-Class.

Car.ID	Brand	Year	Engine.Size	Fuel.Type	Transmission	Mileage	Condition	Price	Model	used.90378.98.E-Class
2495	2495 Mercedes	2001	2.3	Petrol	Manual	162586				
2496	2496 Audi	2020	2.4	Petrol	Automatic	22650				
2497	2497 Audi	2001	5.7	Hybrid	Manual	77701				
2498	2498 Ford	2021	1.1	Hybrid	Manual	272827				
2499	2499 Audi	2002	4.5	Diesel	Manual	229164				
2500	2500 Toyota	2005	4.6	Diesel	Automatic	80978				

**MVLU COLLEGE**  
**Subject:-Data Analysis with SAS / SPSS /R**

```
dim(my_data)
```

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Source

Console Terminal Background Jobs

R > R4.5.2 - .~/

```
Installing packages into 'C:/Users/Pal/AppData/Local/R/win-library/4.5'
(as 'lib' is unspecified)

trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.5/readr_2.1.6.zip'
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.5/psych_2.5.6.zip'

package 'readr' successfully unpacked and MD5 sums checked
package 'psych' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
  C:/users/Pal/Appdata/Local/Temp/RtmpK6GWLQ/downloaded_packages
> library(readr)
> library(psych)
> my_data <- read.csv("car_price_prediction.csv")
>
> my_data <- read.csv("car_price_prediction.csv")
> tail(my_data)
```

Car.ID	Brand	Year	Engine	Size	Fuel.Type	Transmission	Mileage
2495	2495	Mercedes	2001	2.3	Petrol	Manual	162586
2496	2496	Audi	2020	2.4	Petrol	Automatic	22650
2497	2497	Audi	2001	5.7	Hybrid	Manual	77701
2498	2498	Ford	2021	1.1	Hybrid	Manual	272827
2499	2499	Audi	2002	4.5	Diesel	Manual	229164
2500	2500	Toyota	2005	4.6	Diesel	Automatic	80978

```
Condition Price Model
2495 Used 90378.98 E-Class
2496 Like New 61384.10 Q5
2497 Like New 24710.35 A3
2498 Like New 29902.45 Fiesta
2499 Like New 46085.67 Q5
2500 Used 16594.14 RAV4
>
> dim(my_data)
[1] 2500 10
>
```

Environment History Connections Tutorial

R > Global Environment

Data

my\_data 2500 obs. of 10 variables

Files Plots Packages Help Viewer Presentation

New Folder New File Delete Rename More

Home

Name	Size	Modified
Custom Office Templates		
Database.txt	102 B	Oct 30, 2025, 8:34 PM
desktop.ini	402 B	Oct 27, 2025, 3:01 PM
FlashIntegro		
My Music		
My Pictures		
My Videos		
S098 P3.R	0 B	Nov 24, 2025, 5:55 PM
Untitled.R	39 B	Nov 24, 2025, 5:54 PM
car_price_prediction.csv	1563 KB	Nov 18, 2025, 6:52 PM

Activate Windows  
Go to Settings to activate Windows.

```
cat("Dimensions (Rows, Columns): ", dim(my_data), "\n")
```

The screenshot shows the RStudio interface with the following components:

- File Explorer:** Shows files like "Custom Office Templates", "Database.txt", "desktop.ini", "FlashIntegro", "My Music", "My Pictures", "My Videos", "S098 P3.R", "Untitled.R", and "car\_price\_prediction.csv".
- Environment:** Displays the global environment with "my\_data" containing 2500 observations and 10 variables.
- Code Editor:** The script pane contains R code for reading data and calculating dimensions.
- Console:** The output pane shows the execution of the R code, resulting in a data frame with columns: Car.ID, Brand, Year, Engine.Size, Fuel.Type, Transmission, Mileage, Condition, Price, and Model.

```
install.packages(c("readr", "psych"))
library(readr)
library(psych)
my_data <- read.csv("car_price_prediction.csv")
head(my_data)
tail(my_data)
dim(my_data)
cat("Dimensions (Rows, Columns): ", dim(my_data), "\n")
9

9:1 (Top Level) + R Script

Console Terminal x Background Jobs x
R> my_data <- read.csv("car_price_prediction.csv")
> tail(my_data)
#> #>
Car.ID Brand Year Engine.Size Fuel.Type Transmission Mileage
2495 2495 Mercedes 2001 2.3 Petrol Manual 162586
2496 2496 Audi 2020 2.4 Petrol Automatic 22650
2497 2497 Audi 2001 5.7 Hybrid Manual 77701
2498 2498 Ford 2021 1.1 Hybrid Manual 272827
2499 2499 Audi 2002 4.5 Diesel Manual 229164
2500 2500 Toyota 2005 4.6 Diesel Automatic 80978
#>
Condition Price Model
2495 Used 90378.98 E-Class
2496 Like New 61384.10 Q5
2497 Like New 24710.35 A3
2498 Like New 29902.45 Fiesta
2499 Like New 46085.67 Q5
2500 Used 16594.14 RAV4
>
> dim(my_data)
[1] 2500 10
> cat("Dimensions (Rows, Columns): ", dim(my_data), "\n")
Dimensions (Rows, Columns): 2500 10
> |
```

# MVLU COLLEGE

## Subject:-Data Analysis with SAS / SPSS / R

`str(my_data)`

RStudio interface showing the execution of `str(my_data)`. The console output shows the structure of the `my_data` dataset, which contains 2500 observations and 10 variables. The variables include Car.ID, Brand, Year, Engine.size, Fuel.type, Transmission, Mileage, Condition, Price, and Model.

```

RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
S098 P3.R* Environment History Connections Tutorial
Source Run Source
1 install.packages(c("readr", "psych"))
2 library(readr)
3 library(psych)
4 my_data <- read.csv("car_price_prediction.csv")
5 head(my_data)
6 tail(my_data)
7 dim(my_data)
8 cat("Dimensions (Rows, Columns): ", dim(my_data), "\n")
9 str(my_data)
10
[1: 2500 obs. of 10 variables:
 $ Car.ID : int 1 2 3 4 5 6 7 8 9 10 ...
 $ Brand   : chr "tesla" "BMW" "Audi" "tesla" ...
 $ Year    : int 2016 2018 2013 2011 2009 2019 2020 2017 2023 2010 ...
 $ Engine.size: num 2.3 4.4 4.5 4.1 2.0 2.4 4.5 3.3 5.7 1.5 ...
 $ Fuel.Type: chr "Petrol" "Electric" "Electric" "Diesel" ...
 $ Transmission: chr "Manual" "Manual" "Automatic" ...
 $ Mileage : int 114832 143190 181601 68682 223009 246553 135486 83030 120360 135009 ...
 $ Condition: chr "New" "Used" "New" "New" ...
 $ Price   : num 26614 14680 44403 86374 73577 ...
 $ Model   : chr "Model X" "5 Series" "A4" "Model Y" ...
> 
```

Console Terminal Background Jobs

Activate Windows  
Go to Settings to activate Windows.

Windows Taskbar: Type here to search, File Explorer, Task View, Start, Taskbar Icons, Date/Time: 06:08 PM, 24-11-2025

`summary(my_data)`

RStudio interface showing the execution of `summary(my_data)`. The console output provides a detailed summary of the `my_data` dataset, including the distribution (Min., Q1, Median, Mean, Max.) for each numerical variable and the frequency for each categorical variable.

```

RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
S098 P3.R* Environment History Connections Tutorial
Source Run Source
1 install.packages(c("readr", "psych"))
2 library(readr)
3 library(psych)
4 my_data <- read.csv("car_price_prediction.csv")
5 head(my_data)
6 tail(my_data)
7 dim(my_data)
8 cat("Dimensions (Rows, Columns): ", dim(my_data), "\n")
9 str(my_data)
10 summary(my_data)
11
[1: 2500 obs. of 10 variables:
 $ Car.ID : character (length=2500)
 $ Brand   : character (length=2500)
 $ Year    : integer (length=2500)
 $ Engine.size: double (length=2500)
 $ Fuel.type: character (length=2500)
 $ Transmission: character (length=2500)
 $ Mileage : integer (length=2500)
 $ Condition: character (length=2500)
 $ Price   : double (length=2500)
 $ Model   : character (length=2500)
> summary(my_data)
   Car.ID   Brand      Year   Engine.size   Fuel.type
Min.   :  1.0   Length:2500   Min.   :2000   Min.   :1.000   Length:2500
1st qu.: 625.8   Class :character   1st qu.:2005   1st qu.:2.200   Class :character
Median :1250.5   Mode  :character   Median :2012   Median :3.400   Mode  :character
Mean   :1250.5   Mean   :2012   Mean   :3.465   Mean   :3.465   Mean   :2500.0
3rd qu.:1875.2   3rd qu.:2018   3rd qu.:4.700   3rd qu.:4.700   3rd qu.:2023
Max.   :2500.0   Max.   :2023   Max.   :6.000   Max.   :6.000   Max.   :99983
Transmission   Mileage   Condition   Price
Length:2500   Min.   : 15   Length:2500   Min.   : 5011
Class :character   1st qu.: 71832  Class :character   1st qu.:28908
Mode  :character   Median :149085  Mode  :character   Median :53485
Mean   :149750   Mean   :149750  Mean   :52638
3rd qu.:225991   3rd qu.:225991  3rd qu.:75839
Max.   :299967   Max.   :299967  Max.   :99983
   Model
Length:2500
Class :character
Mode  :character
> 
```

Console Terminal Background Jobs

Activate Windows  
Go to Settings to activate Windows.

Windows Taskbar: Type here to search, File Explorer, Task View, Start, Taskbar Icons, Date/Time: 06:09 PM, 24-11-2025

# MVLU COLLEGE

## Subject:-Data Analysis with SAS / SPSS / R

`names(my_data)`

`cat("Column Names: ", names(my_data), "\n")`

```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
S098 P3.R * Source on Save Run Source
3 library(psych)
4 my_data <- read.csv("car_price_prediction.csv")
5 head(my_data)
6 tail(my_data)
7 dim(my_data)
8 cat("Dimensions (rows, columns): ", dim(my_data), "\n")
9 str(my_data)
10 summary(my_data)
11 names(my_data)
12 cat("Column Names: ", names(my_data), "\n")
13 | (Top Level) R Script

Console Terminal Background Jobs
R > R 4.5.2 ~/ 
Median :1250.5 Mode :character Median :2012 Median :3,400 Mode :character
Mean :1250.5 Mean :2012 Mean :3,465
3rd Qu.:1875.2 3rd Qu.:2018 3rd Qu.:4,700
Max. :2500.0 Max. :2023 Max. :6,000
Transmission Mileage Condition Price
Length:2500 Min. : 15 Length:2500 Min. : 5011
Class :character 1st Qu.: 71832 Class :character 1st Qu.:28908
Mode :character Median :149085 Mode :character Median :53485
Mean :149750 Mean :52638
3rd Qu.:225991 3rd Qu.:75839
Max. :299967 Max. :99983

Model
Length:2500
Class :character
Mode :character

> cat("Column Names: ", names(my_data), "\n")
Column Names: Car.ID Brand Year Engine.size Fuel.type Transmission Mileage condition Price Model
> |
```

Activate Windows  
Go to Settings to activate Windows.

29°C Sunny 06:10 PM 24-11-2025

`describe(my_data)`

```
RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
S098 P3.R * Source on Save Run Source
1 install.packages(c("readr", "psych"))
2 library(readr)
3 library(psych)
4 my_data <- read.csv("car_price_prediction.csv")
5 head(my_data)
6 tail(my_data)
7 dim(my_data)
8 cat("Dimensions (rows, columns): ", dim(my_data), "\n")
14:1 | (Top Level) R Script

Console Terminal Background Jobs
R > R 4.5.2 ~/ 
> describe(my_data)
   vars   n    mean      sd   median   trimmed     mad     min     max
Car.ID  1 2500 1250.50  721.83 1250.50 1250.50  926.62  1.00 2500.00
Brand*  2 2500    4.00   2.02    4.00    4.00   2.97  1.00    7.00
Year   3 2500 2011.63    6.99 2012.00 2011.65   8.90 2000.00 2023.00
Engine.size  4 2500    3.47   1.43    3.40    3.46   1.78  1.00    6.00
Fuel.type*  5 2500    2.48   1.13    2.00    2.48   1.48  1.00    4.00
Transmission* 6 2500    1.52   0.50    2.00    1.53   0.00  1.00    2.00
Mileage  7 2500 149749.84 87919.95 149085.00 149780.38 114207.64 15.00 299967.00
Condition* 8 2500    2.01   0.82    2.00    2.01   1.48  1.00    3.00
Price    9 2500 52638.02 27295.83 53485.24 52683.99 34932.80 5011.27 99982.59
Model* 10 2500   14.26   8.10   14.00   14.21   10.38  1.00   28.00
                range   skew  kurtosis   se
Car.ID  2499.00  0.00  -1.20  14.44
Brand*  6.00  0.00  -1.27  0.04
Year   23.00 -0.02  -1.24  0.14
Engine.size  5.00  0.04  -1.18  0.03
Fuel.type*  3.00  0.02  -1.39  0.02
Transmission* 1.00  0.09  -1.99  0.01
Mileage 299952.00  0.01  -1.23 1758.40
Condition* 2.00 -0.01  -1.52  0.02
Price   94971.32 -0.01 -1.21 545.92
Model*  27.00  0.04  -1.21  0.16

   Activate Windows
   Go to Settings to activate Windows.

29°C Sunny 06:11 PM 24-11-2025
```