

Here are the details for each package along with its purpose and the associated library in R:

1. ggplot2

- Purpose: ggplot2 is a powerful and flexible data visualization package in R used for creating graphics and plots.
- Library: ggplot2
- Installation: ``install.packages("ggplot2")``
- Usage: ``library(ggplot2)``

2. dplyr

- Purpose: dplyr is a package for data manipulation and transformation tasks, providing a set of functions that make data manipulation easier.

- Library: dplyr
- Installation: ``install.packages("dplyr")``
- Usage: ``library(dplyr)``

3. tidyr

- Purpose: tidyr is a package for data tidying, which involves reshaping and restructuring data into a tidy format.
- Library: tidyr
- Installation: ``install.packages("tidyr")``
- Usage: ``library(tidyr)``

4. readr

- Purpose: readr is a package for reading and parsing data files, providing functions for efficient reading of structured data into R.

- Library: readr
- Installation: ``install.packages("readr")``
- Usage: ``library(readr)``

5. mice

- Purpose: mice (Multivariate Imputation by Chained Equations) is a package for multiple imputation of missing data, providing methods for handling missing data through imputation.

- Library: mice
- Installation: ``install.packages("mice")``
- Usage: ``library(mice)``

6. tidyverse

- Purpose: tidyverse is a collection of packages for data science and data manipulation, including ggplot2, dplyr, tidyr, and others, providing a consistent set of tools for data analysis.

- Library: tidyverse
- Installation: ``install.packages("tidyverse")``
- Usage: ``library(tidyverse)``

7. e1071

- Purpose: e1071 is a package that provides functions for statistical learning and classification, including support vector machines (SVM) and other machine learning algorithms.

- Library: e1071
- Installation: ``install.packages("e1071")``
- Usage: ``library(e1071)``

8. reshape2

- Purpose: reshape2 is a package for reshaping and restructuring data, providing functions for transforming data between long and wide formats.

- Library: reshape2
- Installation: ``install.packages("reshape2")``
- Usage: ``library(reshape2)``

9. corrplot

- Purpose: corrplot is a package for visualizing correlation matrices and correlation coefficients, providing functions for creating correlation plots.

- Library: corrplot
- Installation: ``install.packages("corrplot")``

10. caret

- Purpose: caret (Classification And REgression Training) is a package for machine learning and predictive modeling, providing tools for training and evaluating various classification and regression models.

- Library: caret

- Installation: ``install.packages("caret")``

- Usage: ``library(caret)``

11. ggfortify

- Purpose: ggfortify is a package that extends ggplot2 by providing enhanced visualization capabilities for various statistical objects and models.

- Library: ggfortify

- Installation: ``install.packages("ggfortify")``

- Usage: ``library(ggfortify)``

12. GGally

- Purpose: GGally is a package for creating extension plots and visualizations for ggplot2, providing functions for exploring data and relationships between variables.

- Library: GGally

- Installation: ``install.packages("GGally")``

- Usage: ``library(GGally)``

13. randomForest

- Purpose: randomForest is a package for building and analyzing random forests, a popular ensemble learning method used for classification and regression tasks.

- Library: randomForest

- Installation: ``install.packages("randomForest")``

- Usage: ``library(randomForest)``

14. gridExtra

- Purpose: gridExtra is a package for arranging multiple grid-based plots on a single page, providing functions for customizing layout and appearance of plots.

- Library: gridExtra

- Installation: ``install.packages("gridExtra")``

- Usage: ``library(gridExtra)``

15. class

- Purpose: class is a package that provides functions for classification tasks, including k-nearest neighbors (KNN) classification.

- Library: class

- Installation: ``install.packages("class")``

- Usage: ``library(class)``

16. data.table

- Purpose: data.table is a package for efficient data manipulation with data tables, providing fast and powerful tools for handling large datasets.

- Library: data.table

- Installation: ``install.packages("data.table")``

- Usage: ``library(data.table)``

These packages cover a wide range of tasks in data manipulation, visualization, statistical analysis, and machine learning in R.