Best R Libraries for Machine Learning

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Introduction

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ML is the application of artificial intelligence (AI) to statistics and statistical analysis.

The techniques used in ML allows you to automate the search for patterns in data.

Introduction

Some applications:

- Credit risk analysis;
- Medical diagnostics;
- Marketing;
- Credit card fraud detection;
- Natural language processing;
- Recommendation systems;
- And many more!

Types of problems and tasks

- Supervised learning
- Unsupervised learning
- Reinforcement learning.

Supervised learning

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In this way, the solutions can be used to help supervise the training process to find the optimal algorithm parameters.

- Regression problem
- Classification problem.

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- **Construction (or training) of the model** - input and output values are known;
- **Prediction** - Classification for nominal data (categorical variable) and regression for numerical variable.

Supervised learning - main models

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There are many models used in machine learning (ML), of which we can highlight:

- Classic linear and nonlinear functional models;
- Decision trees;
- Random forests;
- Artificial neural networks (ANN);
- Probabilistic methods (Bayesian);
- K nearest neighbors - KNN;
- Support Vector Machines (SVM);
- ...

Supervised learning - some packages (best)

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- dplyr;
- **e1071**;
- ggplot2;
- **randomForest**;
- **rpart**.

Application example

	A	B	C	D	E
1	Sepal Length	Sepal Width	Petal Length	Petal Width	Class
2	5.1	3.5	1.4	0.2	Iris-setosa
3	4.9	3	1.4	0.2	Iris-setosa
4	4.7	3.2	1.3	0.2	Iris-setosa
5	4.6	3.1	1.5	0.2	Iris-setosa
6	5	3.6	1.4	0.2	Iris-setosa
7	5.4	3.9	1.7	0.4	Iris-setosa
8	4.6	3.4	1.4	0.3	Iris-setosa
9	5	3.4	1.5	0.2	Iris-setosa
10	4.4	2.9	1.4	0.2	Iris-setosa
11	4.9	3.1	1.5	0.1	Iris-setosa
12	5.4	3.7	1.5	0.2	Iris-setosa
13	4.8	3.4	1.6	0.2	Iris-setosa
14	4.8	3	1.4	0.1	Iris-setosa
15	4.3	3	1.1	0.1	Iris-setosa
16	5.8	4	1.2	0.2	Iris-setosa
17	5.7	4.4	1.5	0.4	Iris-setosa
18	5.4	3.9	1.3	0.4	Iris-setosa
19	5.1	3.5	1.4	0.3	Iris-setosa
20	5.7	3.8	1.7	0.3	Iris-setosa

Final considerations

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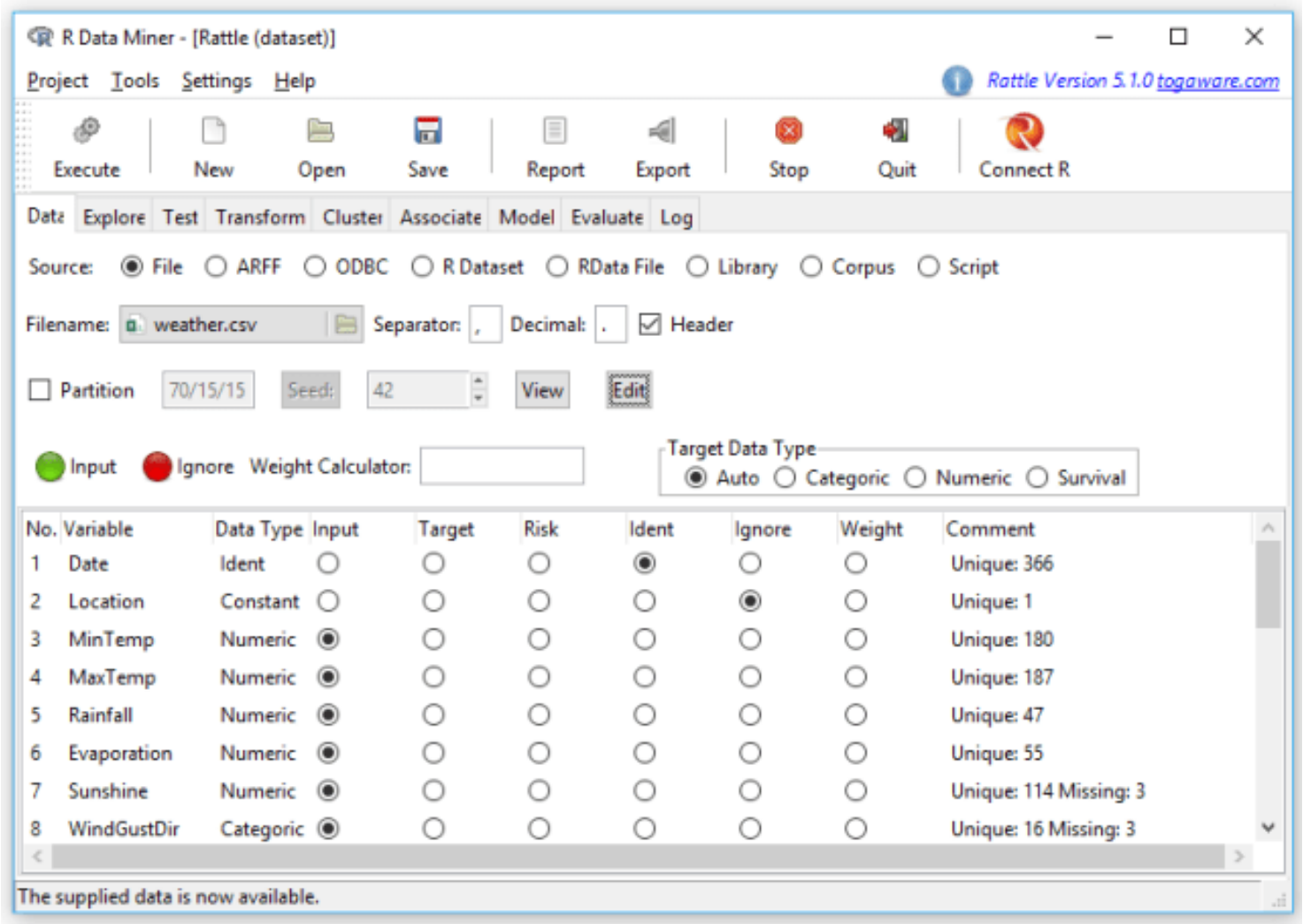
- **nnet**: Feed - Forward Neural Networks and Multinomial Log-Linear Models.

Final considerations

- **rattle**: a free graphical user interface for Data Science.



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