

Logistic Regression

The logistic regression classification algorithm with LASSO (L1) or ridge (L2) regularization.

Inputs

- Data: input dataset
- Preprocessor: preprocessing method(s)

Outputs

- Learner: logistic regression learning algorithm
- Model: trained model
- Coefficients: logistic regression coefficients

Logistic Regression learns a **Logistic Regression** model from the data. It only works for classification tasks.

Logistic Regression

Name

Logistic Regression

Regularization type: Ridge (L2)

Strength:

Weak Strong

C=1

Report ☒ Apply Automatically

1. A name under which the learner appears in other widgets. The default name is “Logistic Regression”.
2. **Regularization** type (either **L1** or **L2**). Set the cost strength (default is $C=1$).
3. Press *Apply* to commit changes. If *Apply Automatically* is ticked, changes will be communicated automatically.

Example

The widget is used just as any other widget for inducing a classifier. This is an example demonstrating prediction results with logistic regression on the *hayes-roth* dataset. We first load *hayes-roth_learn* in the **File** widget and pass the data to **Logistic Regression**. Then we pass the trained model to **Predictions**.

Now we want to predict class value on a new dataset. We load *hayes-roth_test* in the second **File** widget and connect it to **Predictions**. We can now observe class values predicted with **Logistic Regression** directly in **Predictions**.

The screenshot shows the Orange Data Mining workflow and the **Predictions** widget output. The workflow consists of two **File** widgets, a **Logistic Regression** widget, and a **Predictions** widget. The first **File** widget (labeled 'Train data') is connected to the **Logistic Regression** widget. The second **File** widget (labeled 'Test data') is connected to the **Predictions** widget. The **Logistic Regression** widget is also connected to the **Predictions** widget.

The **Logistic Regression** widget settings are as follows:

- Name: Logistic Regression
- Regularization type: Ridge (L2)
- Strength: Weak (C=1)
- Report: ☒ Apply Automatically

The **Predictions** widget settings are as follows:

- Info: Data: 28 instances. Predictors: 1. Task: Classification. Restore Original Order
- Show: ☒ Predicted class, ☒ Predicted probabilities for: 1, 2, 3. ☒ Draw distribution bars
- Data View: ☒ Show full data set
- Output: ☒ Original data, ☒ Predictions, ☒ Probabilities. Report

The **Predictions** widget output table is as follows:

	Logistic Regression	y	hobby	age	education	marital
1	0.77 : 0.17 : 0.06 → 1	1	1	1	1	2
2	0.77 : 0.17 : 0.06 → 1	1	1	1	2	1
3	0.77 : 0.17 : 0.06 → 1	1	1	2	1	1
4	0.88 : 0.04 : 0.08 → 1	1	1	1	1	3
5	0.88 : 0.04 : 0.08 → 1	1	1	1	3	1
6	0.88 : 0.04 : 0.08 → 1	1	1	3	1	1
7	0.73 : 0.15 : 0.12 → 1	1	1	1	3	3
8	0.73 : 0.15 : 0.12 → 1	1	1	3	1	3
9	0.73 : 0.15 : 0.12 → 1	1	1	3	3	1
10	0.17 : 0.77 : 0.06 → 2	2	1	2	2	1
11	0.17 : 0.77 : 0.06 → 2	2	1	2	1	2
12	0.17 : 0.77 : 0.06 → 2	2	1	1	2	2
13	0.04 : 0.88 : 0.08 → 2	2	1	2	2	3
14	0.04 : 0.88 : 0.08 → 2	2	1	2	3	2
15	0.04 : 0.88 : 0.08 → 2	2	1	3	2	2
16	0.15 : 0.73 : 0.12 → 2	2	1	2	3	3
17	0.15 : 0.73 : 0.12 → 2	2	1	3	2	3
18	0.15 : 0.73 : 0.12 → 2	2	1	3	3	2
19	0.46 : 0.46 : 0.09 → 1	1	1	1	3	2
20	0.46 : 0.46 : 0.09 → 2	2	1	3	2	1
21	0.46 : 0.46 : 0.09 → 1	1	1	2	1	3
22	0.46 : 0.46 : 0.09 → 2	2	1	2	3	1