

# Transforming the prediction target (y)

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\scikit-learn-main\doc\modules\[scikit-learn-main] [doc] [modules]preprocessing\_targets.rst, line 1)

Unknown directive type "currentmodule".

```
.. currentmodule:: sklearn.preprocessing
```

These are transformers that are not intended to be used on features, only on supervised learning targets. See also `ref:'transformed_target_regressor'` if you want to transform the prediction target for learning, but evaluate the model in the original (untransformed) space.

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## Label binarization

### LabelBinarizer

`class:'LabelBinarizer'` is a utility class to help create a `term:'label indicator matrix'` from a list of `term:'multiclass'` labels:

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```
>>> from sklearn import preprocessing
>>> lb = preprocessing.LabelBinarizer()
>>> lb.fit([1, 2, 6, 4, 2])
LabelBinarizer()
>>> lb.classes_
array([1, 2, 4, 6])
>>> lb.transform([1, 6])
array([[1, 0, 0, 0],
       [0, 0, 0, 1]])
```

Using this format can enable multiclass classification in estimators that support the label indicator matrix format.

### Warning

LabelBinarizer is not needed if you are using an estimator that already supports `term:'multiclass'` data.

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For more information about multiclass classification, refer to [:ref: multiclass\\_classification`](#).

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## MultiLabelBinarizer

In [:term: multilabel`](#) learning, the joint set of binary classification tasks is expressed with a label binary indicator array: each sample is one row of a 2d array of shape (n\_samples, n\_classes) with binary values where the one, i.e. the non zero elements, corresponds to the subset of labels for that sample. An array such as `np.array([[1, 0, 0], [0, 1, 1], [0, 0, 0]])` represents label 0 in the first sample, labels 1 and 2 in the second sample, and no labels in the third sample.

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Producing multilabel data as a list of sets of labels may be more intuitive. The [:class: MultiLabelBinarizer`](#) `<sklearn.preprocessing.MultiLabelBinarizer>` transformer can be used to convert between a collection of collections of labels and the indicator format:

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```
>>> from sklearn.preprocessing import MultiLabelBinarizer
>>> y = [[2, 3, 4], [2], [0, 1, 3], [0, 1, 2, 3, 4], [0, 1, 2]]
>>> MultiLabelBinarizer().fit_transform(y)
array([[0, 0, 1, 1, 1],
       [0, 0, 1, 0, 0],
       [1, 1, 0, 1, 0],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 0, 0]])
```

For more information about multilabel classification, refer to [:ref: multilabel\\_classification`](#).

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## Label encoding

[:class: LabelEncoder`](#) is a utility class to help normalize labels such that they contain only values between 0 and n\_classes-1. This is sometimes useful for writing efficient Cython routines. [:class: LabelEncoder`](#) can be used as follows:

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```
>>> from sklearn import preprocessing
>>> le = preprocessing.LabelEncoder()
>>> le.fit([1, 2, 2, 6])
```

```
LabelEncoder()
>>> le.classes_
array([1, 2, 6])
>>> le.transform([1, 1, 2, 6])
array([0, 0, 1, 2])
>>> le.inverse_transform([0, 0, 1, 2])
array([1, 1, 2, 6])
```

It can also be used to transform non-numerical labels (as long as they are hashable and comparable) to numerical labels:

```
>>> le = preprocessing.LabelEncoder()
>>> le.fit(["paris", "paris", "tokyo", "amsterdam"])
LabelEncoder()
>>> list(le.classes_)
['amsterdam', 'paris', 'tokyo']
>>> le.transform(["tokyo", "tokyo", "paris"])
array([2, 2, 1])
>>> list(le.inverse_transform([2, 2, 1]))
['tokyo', 'tokyo', 'paris']
```