

# Machine Learning

This page describes how to use the machine learning (aka mining) bundle.

## Operators

- [Clustering](#)
- [Classify](#)
- [Classification\\_learn](#)
- [FrequentItemset](#)
- [GenerateRules](#)

## Ensembles

You can simply combine all operators with other operators in Odysseus to create ensembles.

If we have, for example a stream with windspeed and power (speedandpower) and another one containing the windspeed (e.g. a forecast).

Then, it is possible to create different regression functions, use them and weight the regression results by an aggregation.

One example:

```
/// create the first classifier by using SMO
smo = CLASSIFICATION_LEARN({
    class='power',
    learner = 'weka',
    algorithm = ['model']='SMO-REGRESSION']
},
speedandpower
)

/// create the second classifier by using gaussian processes
gaussian = CLASSIFICATION_LEARN({
    class='power',
    learner = 'weka',
    algorithm = ['model']='GAUSSIAN-PROCESSES']
},
speedandpower
)

/// create the third classifier by using a linear regression
linear = CLASSIFICATION_LEARN({
    class='power',
    learner = 'weka',
    algorithm = ['model']='LINEAR-REGRESSION']
},
speedandpower
)

/// union them all into one stream
unioned = UNION(smo, gaussian, linear)

/// then, classify them - each tuple will be classified by using all three classifiers
ensemble = CLASSIFY(speed, unioned)

/// aggregate the class using average - which allows a weighted kind of voting
agg = AGGREGATE({
    aggregations=[
        ['AVG', 'class', 'powerForecast', 'DOUBLE']
    ]
},
ensemble
)
```

# Examples

to be added