Weka 3.6 Tutorial

(**W**aikato **E**nvironment for **K**nowledge **A**nalysis)

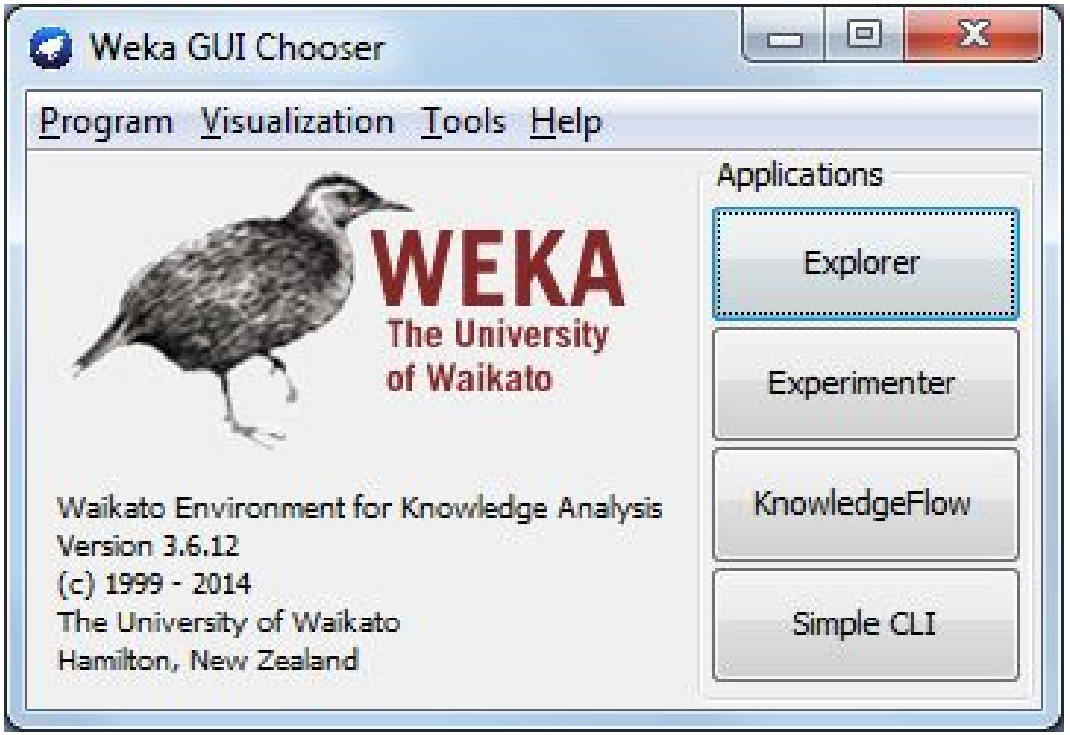
WEKA

- It's a data mining/machine learning tool developed by University of Waikato.

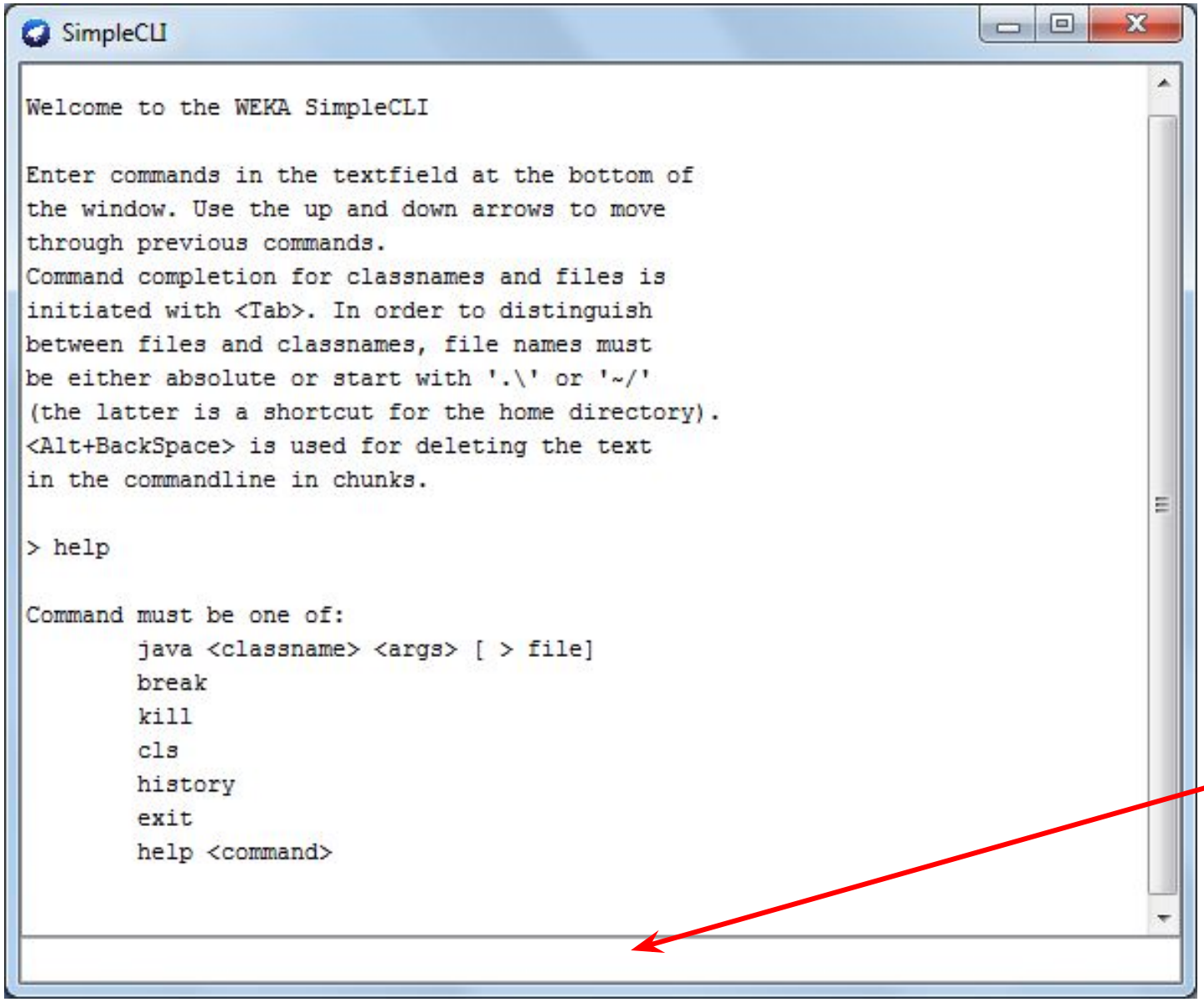
- Main Features:
  - 49 data preprocessing tools
  - 76 classification/regression algorithms
  - 8 clustering algorithms
  - 3 algorithms for finding association rules
  - 15 attribute/subset evaluators + 10 search algorithms for feature selection

Starting WEKA

- 4 Options
  - Explorer
  - Experimenter
  - Knowledge Flow
  - Simple CLI



Weka Simple CLI



Preprocessing Data

- Data can be imported from a file in various formats: ARFF, CSV etc.
- Data can also be read from a URL or from an SQL database (using JDBC)
- Pre-processing tools in WEKA are called “filters”

CSV (Comma Separated) File

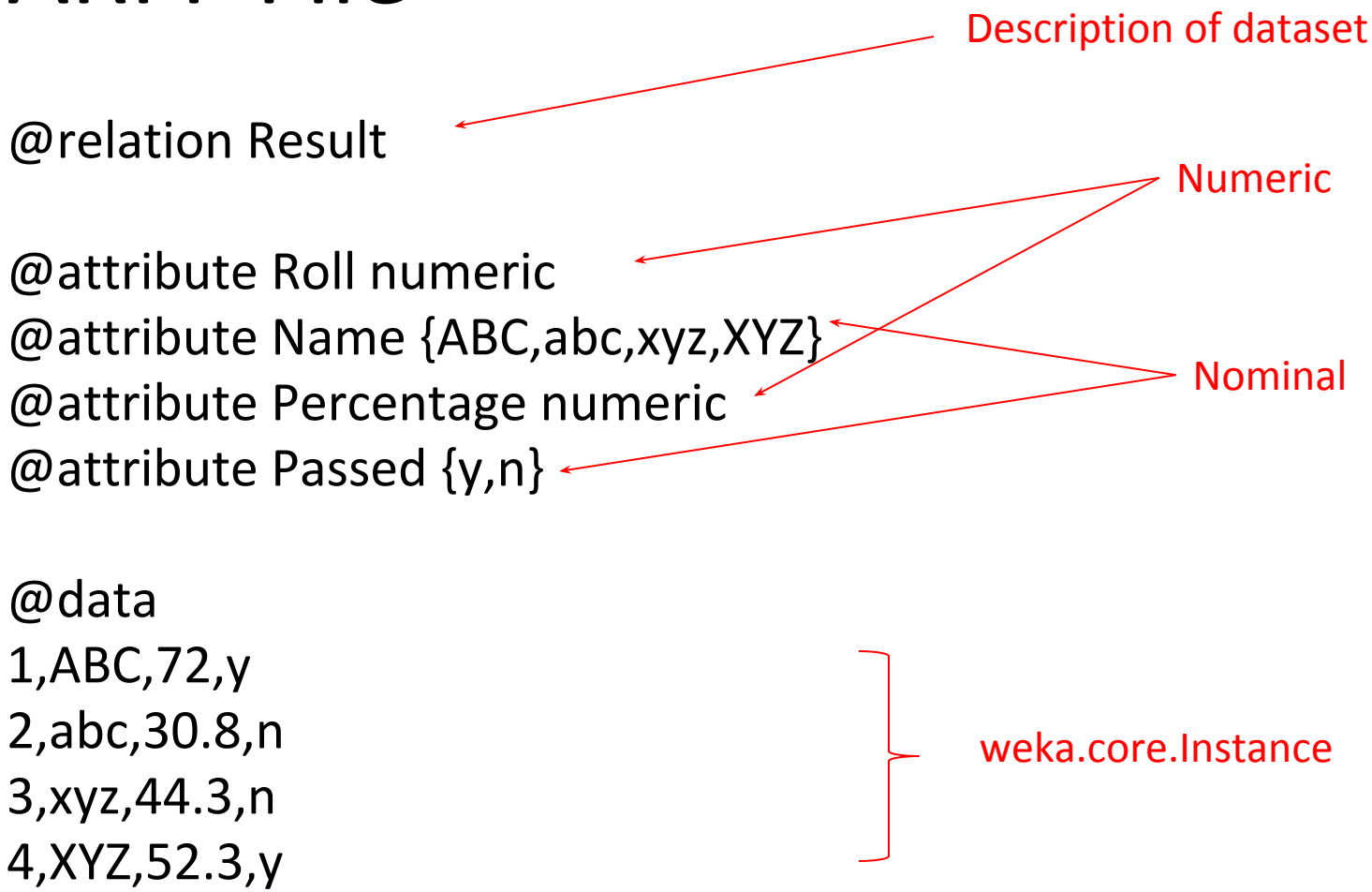
```
Roll,Name,Percentage,Passed
1,ABC,72,y
2,abc,30.8,n
3,xyz,44.3,n
4,XYZ,52.3,y
```

Result.csv

Command for converting csv to arff:

```
java weka.core.converters.CSVLoader Result.csv > Result.arff
```

ARFF File


Description of dataset
@relation Result
Numeric
@attribute Roll numeric
@attribute Name {ABC,abc,xyz,XYZ}
@attribute Percentage numeric
@attribute Passed {y,n}
Nominal
@data
1,ABC,72,y
2,abc,30.8,n
3,xyz,44.3,n
4,XYZ,52.3,y
weka.core.Instance

Weka.Classifiers

- A simple example

```
java weka.classifiers.trees.J48 -t data/weather.arff
```

Classifier: Decision tree

Specifies training file

Classifier: NaiveBayes

```
java weka.classifiers.bayes.NaiveBayes -t data/weather.arff
```

Weka.Classifiers

- Classifier's option:
  - weka.classifiers.trees.J48
  - weka.classifiers.bayes.NaiveBayes
  - weka.classifiers.functions.Logistic
  - weka.classifiers.functions.SMO

Weka.Classifiers

- Other options:
  - -t : Specifies training file
  - -T: Specifies test file
  - -x: Number of cross validation
  - -c: set the class index
  - -d: Save the model
  - -i: Detailed performance description
  - -p #: Prediction and one attribute value

Few more complex examples

```
java -Xmx1024m weka.classifiers.trees.J48 -t data.arff –i –x 3
```

```
java -Xmx1024m weka.classifiers.trees.J48 -t data.arff –i –T
testData.arff –p 1
```

```
java -Xmx1024m weka.classifiers.trees.J48 -t data.arff –i –T
testData.arff -d J48-data.model >&! J48-data.out &
```

```
java -Xmx1024m weka.classifiers.meta.FilteredClassifier -t data.arff –i
–T testData.arff –i –c last –F
weka.filters.unsupervised.attribute.StringToWordVector –W
weka.classifier.functions.SMO > Output
```

```
java -Xmx1024m –cp weka.jar:LibSVM.jar
weka.classifiers.meta.FilteredClassifier -t data.arff –i –T
testData.arff –i –c last –F
weka.filters.unsupervised.attribute.StringToWordVector –W
weka.classifier.functions.LibSVM > Output
```

Weka Filters

- Used to transform input data
  - Removing or adding attributes
  - Resampling the dataset
  - Removing examples
  - …