

User Guide

We use python 2.7.10 with numpy library to implement the coursework and use Graphviz and Matplotlib to draw decision trees. To build the environment in Linux Ubuntu 16.04, we need to follow these steps.

Installing Graphviz

Firstly, we need to download Graphviz Software for drawing the decision trees. Go to <http://www.graphviz.org/Download.php> and click the “agree” button at the bottom of the page.

For Ubuntu 16.04, find the “executable packages from AT&T” on the website and click the link “stable and development deps for Ubuntu systems”.

Executable Packages from AT&T

Linux

Stable and development rpms for Redhat

Enterprise, or Centos systems

Stable and development rpms for Fedora systems

Stable and development deps for Ubuntu systems

In the next page, find newest stable versions to download. You need administrator right to install Graphviz.

| graphviz | current stable release |
|----------------|--|
| | graphviz_2.38.0-1~saucy_amd64.deb |
| | libgraphviz-dev_2.38.0-1~saucy_amd64.d |
| | libgraphviz4_2.38.0-1~saucy_amd64.deb |
| | libgv-guile_2.38.0-1~saucy_amd64.deb |
| | libgv-lua_2.38.0-1~saucy_amd64.deb |
| | libgv-ocaml_2.38.0-1~saucy_amd64.deb |
| UB13.10.x86_64 | libgv-perl_2.38.0-1~saucy_amd64.deb |
| | libgv-php5_2.38.0-1~saucy_amd64.deb |
| | libgv-python_2.38.0-1~saucy_amd64.deb |
| | libgv-ruby_2.38.0-1~saucy_amd64.deb |

For Windows, find the link “stable and development Windows Install packages”.

Windows

Stable and development Windows Install packages

And download current stable release “graphviz-2.38.zip” in the linking page. Don’t forget to add direction of “bin” folder from where we release into the system Path.

For Mac, this software does not support the newest 10.12 macOS Sierra, so we don't advise running it in Mac. But you can also get the output files and can transform six graphviz files to picture in Linux and Windows.

Installing Packages

In Ubuntu 16.04, we can use pip to install python package used in our project. If computer haven't installed pip before, open terminal to run this command to install.

```
$ sudo apt install python-pip
```

And run the following command for upgrading if need.

```
$ pip install --upgrade pip
```

Also, we need to install python-tk package with command:

```
$ sudo apt-get install python-tk
```

Then we use pip to install libraries, scipy, matplotlib, numpy and graphviz. With commands

```
$ sudo pip install scipy
```

```
$ sudo pip install matplotlib
```

```
$ sudo pip install numpy
```

```
$ sudo pip install graphviz
```

Draw Decision Trees

After we configure the software environment successfully, run 'DrawDecisionTree.py' and 'cleandata_students.mat' in its directory in terminal.

```
$ python DrawDecisionTree.py cleandata_students.mat
```

The six output Decision Tree Diagrams (also their graphviz files) will be produced in the 'output' folder.

For evaluation, put the test data documents follow the TestDecisionTree.py

```
$ python TestDecisionTree.py "Name of Test Data"
```