

```
10 WriteIn 'Hi AI';  
20 Goto 10;
```



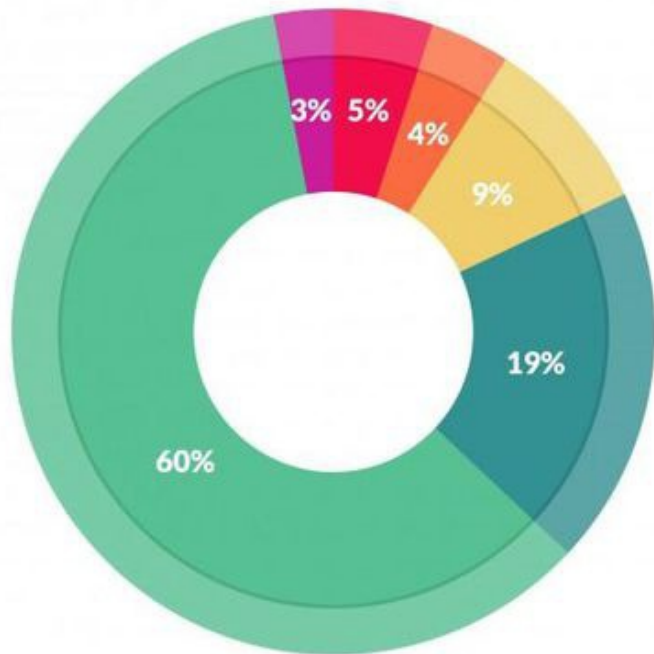
ML VSCode Data Vision





Agenda BASTA 23/09/2020

- Data Preprocessing & Understanding
- Matplotlib Basics in Jupyter
- GraphViz (dot) language support, a C# wrapper for GraphViz graph generator for dotnet core.
- Integrate (VS Code/Jupyter Notebook/dotnet try)
- Installation, Optimisation & Sources



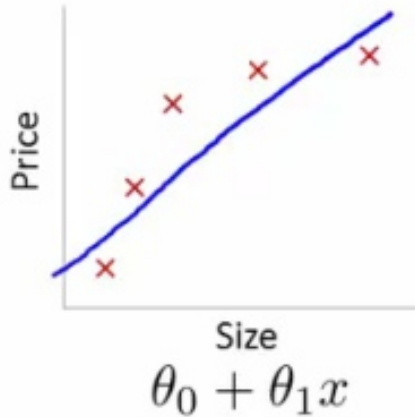
What data scientists spend the most time doing

- Building training sets: 3%
- Cleaning and organizing data: 60%
- Collecting data sets: 19%
- Mining data for patterns: 9%
- Refining algorithms: 4%
- Other: 5%

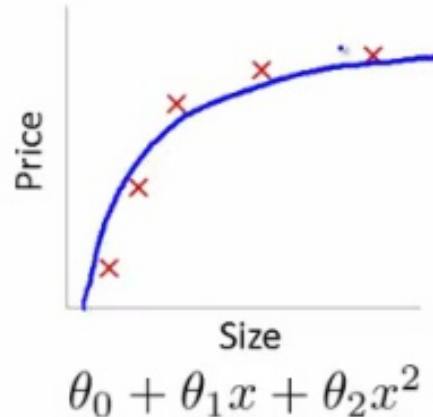
Now Demo: TensorFlowTest64.dproj



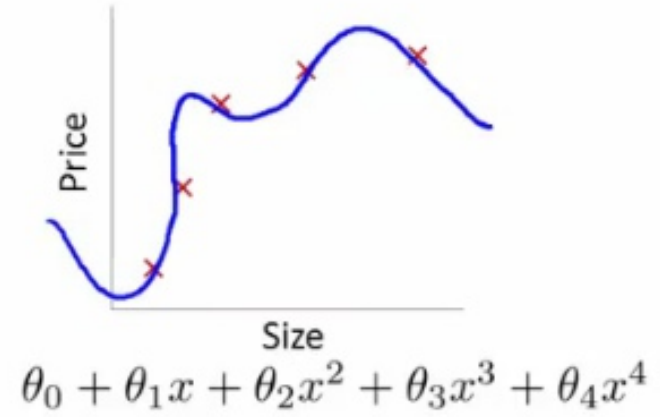
Machine Learning Fit



High bias
(underfit)



"Just right"

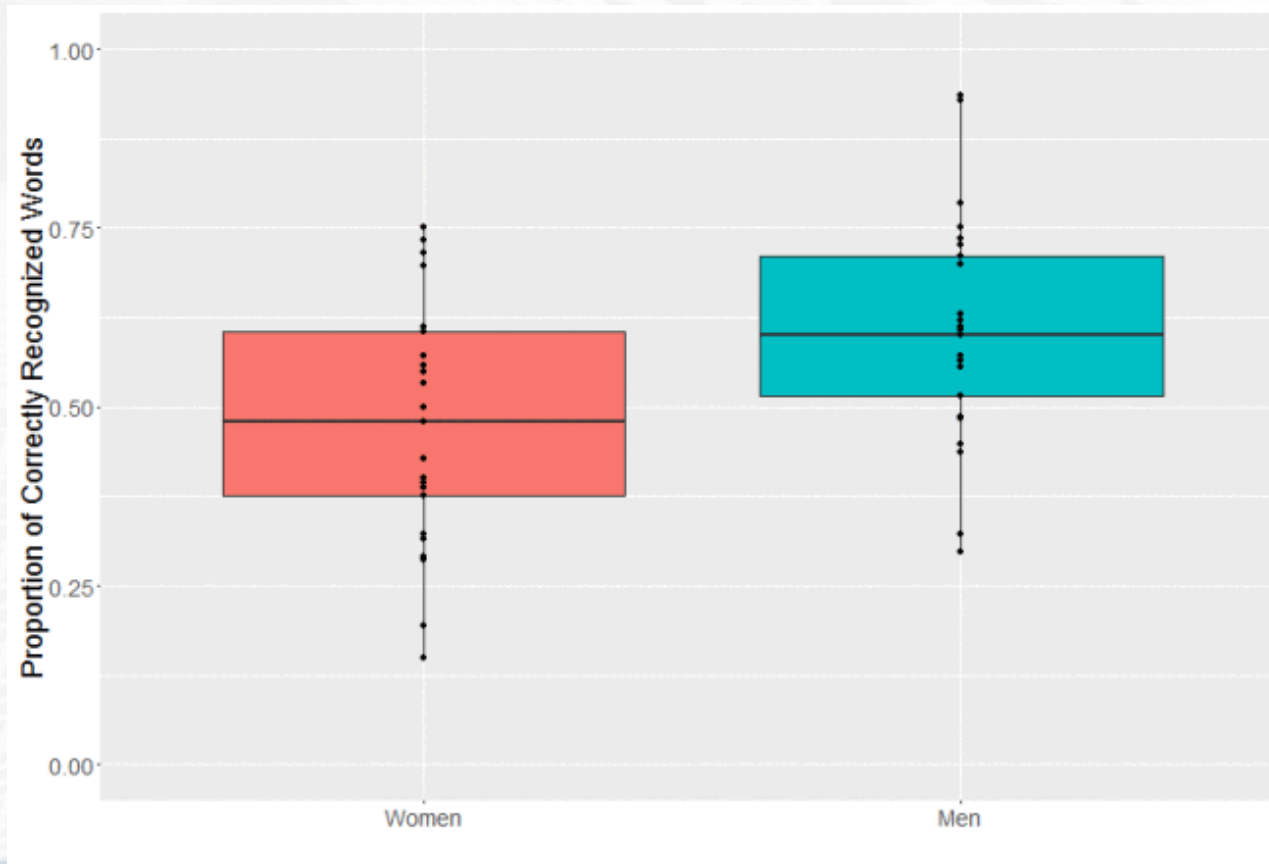


High variance
(overfit)

<https://makingnoiseandhearingthings.com/2016/07/12/googles-speech-recognition-has-a-gender-bias/>



Speech Recognition Boxplot





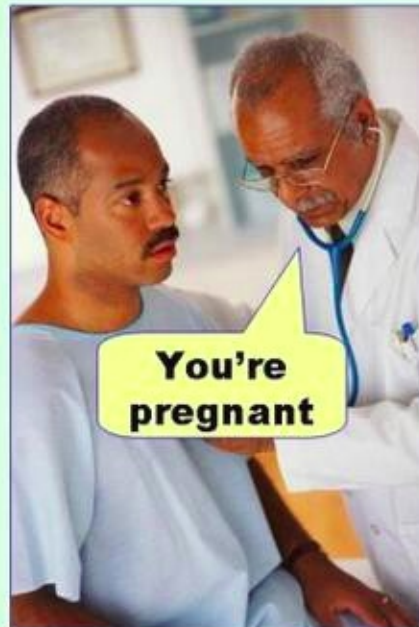
Confusion Matrix Data Truth

n=165	Predicted: NO	Predicted: YES	
Actual: NO	TN = 50	FP = 10	60
Actual: YES	FN = 5	TP = 100	105
	55	110	



Type I & II error

Type I error
(false positive)



Type II error
(false negative)





Demo matplotlib Plots

```
c > maxBox > mX47464 > maxbox4 > examples > 410_titanic_keras_predictor.py > ...
148 plot_confusion_matrix(cm)
149 plt.show()
150
151 print(metrics.classification_report(titanic['Survived'], predictions))
152 print(titanic.groupby(['Sex', 'Pclass']) \
153       | ['Survived'].aggregate('mean').unstack())
154 print(titanic.groupby(['Sex', 'Pclass'])['Survived'].mean().unstack())
155
156 show_similars(titanic[predictors], ['Fare', 'Pclass'], 0.7)
157 show_similars(titanic[predictors], ['Fare', 'Age'], 0.5)
158 show_similars(titanic[predictors], ['Sex', 'Age'], 0.2)
159 show_similars(titanic[predictors], ['Sex', 'Pclass'], 0.1)
160 #titanic['Pclass1'] = titanic[titanic.Pclass==1]
161 dfcp = titanic[titanic['Pclass'] == 1]
162 #dfcs = titanic[titanic['Sex'] == titanic['Pclass']=='1']
163 #show_similars(titanic[predictors], [dfcp, dfcs], 0.4)
164
165 print('Titanic KerasClassifier time: %0.3f secs' % (time.time()-tstart))
166
167 """
168
```

PROBLEMS 96 OUTPUT DEBUG CONSOLE TERMINAL

Sex	0	1	Pclass	Sex	0	1
0	0.368852	0.157407	0.135447	0	0.368852	0.157407
1	0.968085	0.921053	0.500000	1	0.968085	0.921053
Pclass	1	2	3			

Python 3.6.3 64-bit 12 75 9 Server not selected Ln 156, Col 7 Spaces: 4 UTF-8 LF Python

<https://www.tensorflow.org/>



Jupyter matplotlib notebook Demo

- Barchart (Histograms, Maps, Plot)
- Confusion-, Correlation Matrix
- PieChart, Density Plot, Heatmaps

https://colab.research.google.com/drive/1pQPsMzru1eXYb7Q9WV5V3dqni_KBJ2n

https://colab.research.google.com/github/maxkleiner/maXbox4/blob/master/BASTA_2020_matplotlib_presentation2.ipynb

<https://github.com/maxkleiner/maXbox/blob/master/waterpumpspredictor2.ipynb>

GraphViz-C-Sharp-Wrapper Demo:

<https://sourceforge.net/projects/maxbox/files/Examples/EKON/BASTA2020/visout.zip/download>

<https://github.com/helgeu/GraphViz-C-Sharp-Wrapper>





Visualise Model with Graph

dense_19_input: InputLayer	input:	(None, 6)
	output:	(None, 6)



dense_19: Dense	input:	(None, 6)
	output:	(None, 12)



dense_20: Dense	input:	(None, 12)
	output:	(None, 10)



dense_21: Dense	input:	(None, 10)
	output:	(None, 1)

```
NN:= TFannNetwork.create(self)
with NN do begin
  Layers.add('2')
  Layers.add('3')
  Layers.add('1')
  LearningRate:= 0.699999988079071100
  ConnectionRate:= 1.000
  TrainingAlgorithm:= taFANN_TRAIN_RPROP
  ActivationFunctionHidden:= afFANN_SIGMOID
  ActivationFunctionOutput:= afFANN_SIGMOID
end;
```

Graph Viz



File Edit Selection View Go Run Terminal Help Extension: Graphviz (dot) language support for Visual Studio Code - twitterhatespeechmaster (Workspace) - Visual Studio Code

EXPLORER

OPEN EDITORS

- 3DRegression_stats2.py C:\maXbo...
- mnist_softmax2.py C:\maXbox\mX...
- 3DClustering_n2.py C:\maXbox\m...
- 420_batch_gen_waterpump... 9+
- Extension: Graphviz (dot) langua...
- 410_titanic_keras_predictor.py C:\...
- preprocess_twitter.py twitter-hate...
- tfidf.py twitter-hatespeech-master
- data_handler.py twitter-hatespec...

TWITTERHATESPEECHMASTER (WORKSPACE)

- watertrain.csv
- .gitignore
- 420_batch_gen_waterpumps.py
- Baseline-Paper.pdf
- batch_gen.py

OUTLINE

The active editor cannot provide outline information.

TIMELINE

SONARLINT RULES

- HTML
- Java
- JavaScript

Graphviz (dot) language support for Visual Studio Code

João Pinto | 42,065 | ★★★★★ | Repository | License | v0.0.6

This extension provides GraphViz (dot) language support for Visual Studio Code

[Install](#)

Details Feature Contributions

Graphviz Support

Visual Studio Marketplace v0.0.6 installs 42063 rating average: 5/5 (7 ratings)

A vscode extension that provides language support and live preview for the Graphviz format.

The preview uses the [Viz.js](#) library.

The extension can be activated in two ways

PROBLEMS 20 OUTPUT DEBUG CONSOLE **TERMINAL**

1: cmd

Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\maXbox\EKON24\decimals\twitter-hatespeech-master\twitter-hatespeech-master>

The "global" command is not available. Make sure it is on PATH. Source: Pascal (Extension)

[More Info](#) [Don't show again](#)

Python 3.6.3 64-bit 1 12 7 Server not selected

BASTA!

maXbox



Graphviz

Graphviz is open source graph visualization software. Graph visualization is a way of representing structural information as diagrams of abstract graphs and networks.

It has important applications in networking, bioinformatics, software engineering, database and web design, machine learning, and in visual interfaces for other technical domains. Open In Colab

https://colab.research.google.com/github/maxkleiner/maXbox/blob/master/Copy_of_simple_image_classification_with_any_dataset.ipynb

https://colab.research.google.com/github/maxkleiner/maXbox/blob/master/Copy_of_simple_image_classification_with_any_dataset.ipynb





GraphViz-C-Sharp-Wrapper

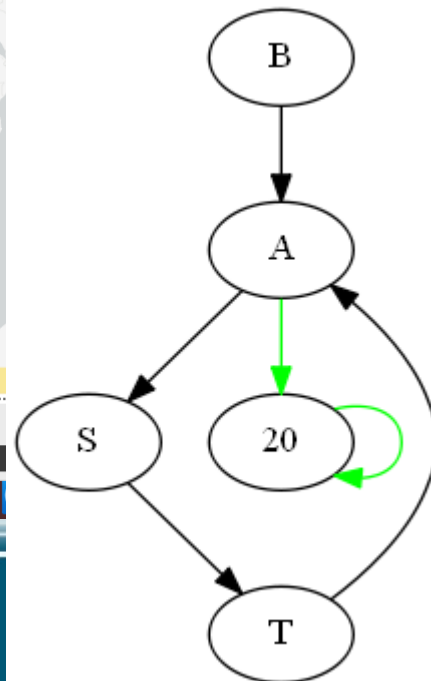
- using System.Collections;
- using System.Runtime.InteropServices;
- using GraphVizWrapper;
- using GraphVizWrapper.Commands;
- using GraphVizWrapper.Queries;
- using Graphviz4Net.Graphs;
- using System.Drawing.Imaging;
- using System.Drawing;
- using System.Drawing.Drawing2D;
- using System.IO; //memory stream





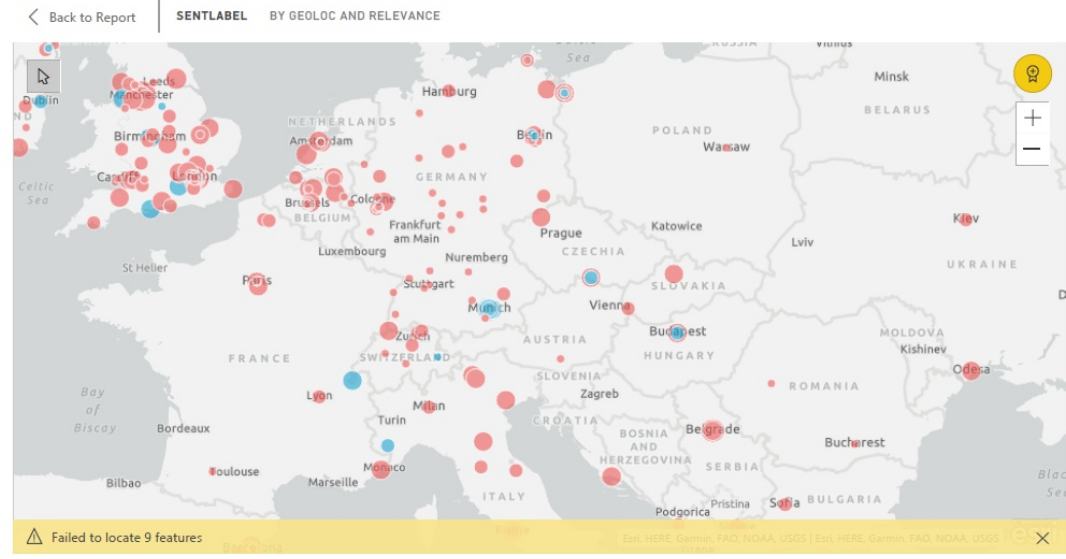
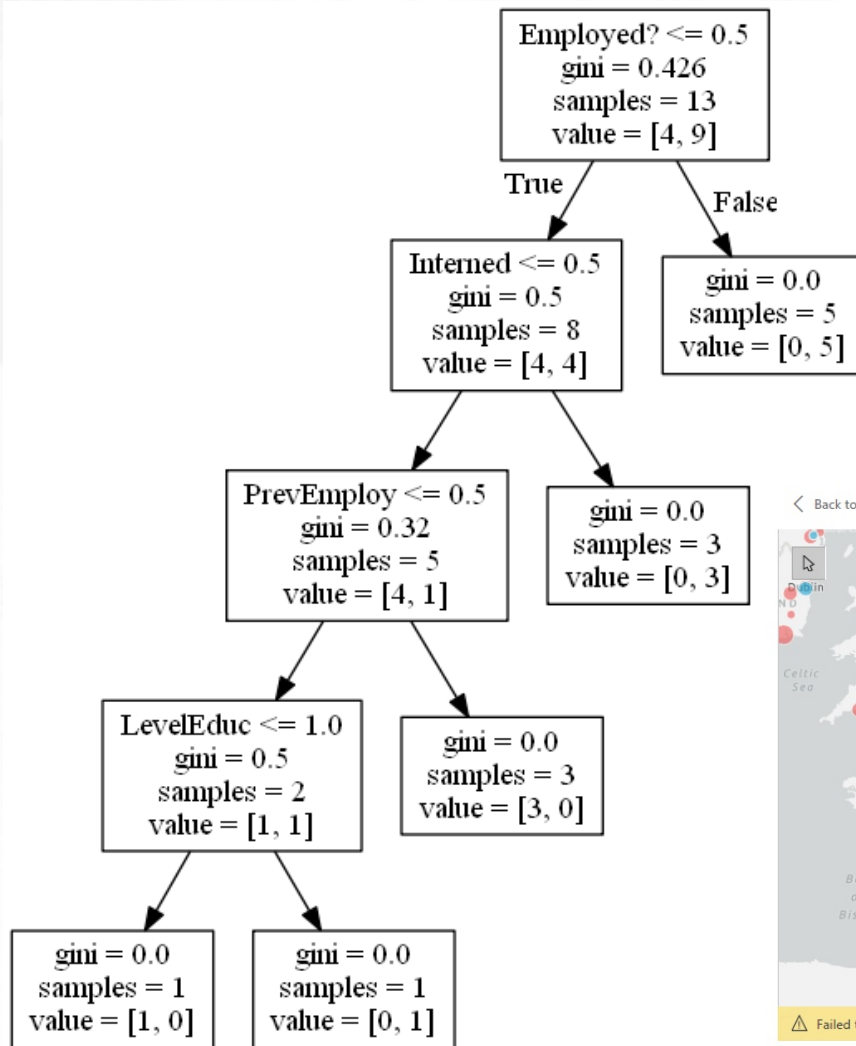
Graph Viz Demo

The screenshot shows the Power BI Desktop interface. The top ribbon includes tabs for File, Home, View, Modeling, and Help. The 'Get Data' dropdown menu is open, showing options like Excel, Power BI datasets, SQL Server, and Text/CSV. A tooltip for 'Text/CSV' says 'Import data from a text or CSV file.' The main canvas displays a world map with red circular markers. Overlaid on the map is a graph visualization with five nodes: B, A, S, 20, and T. Node B is at the top, connected to A. Node A is connected to S and 20. Node S is connected to T. Node 20 is connected to T. A green arrow points from A to 20, and a green curved arrow points from 20 back to A. The right-hand pane shows the 'VISUALIZATIONS' and 'FIELDS' sections. The 'FIELDS' section lists columns from a table named 'TextCrawled408_se...'. The status bar at the bottom indicates 'PAGE 1 OF 1' and '07:36 01/04/2019'.



BASTA!

maxbox



BASTA!

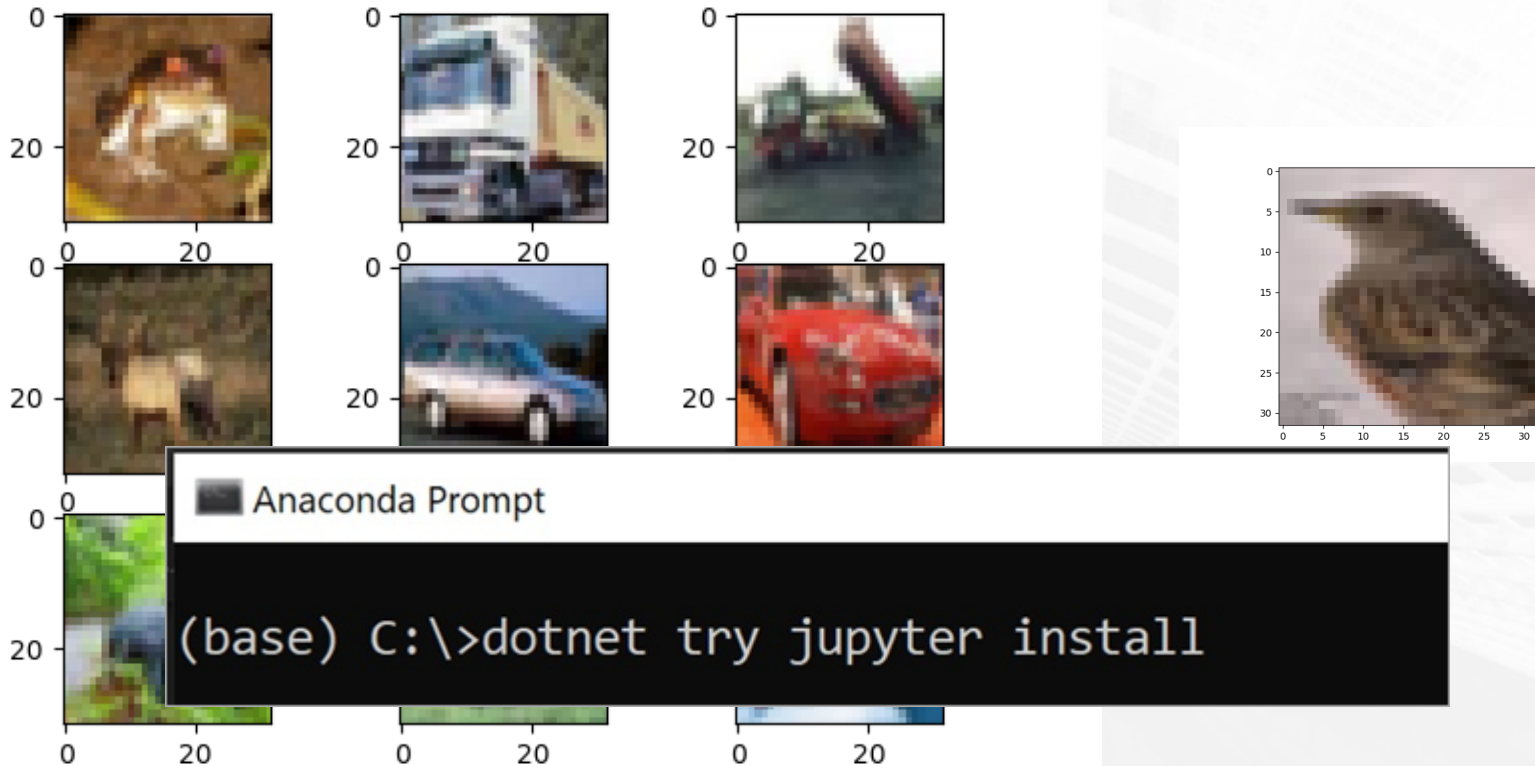
maxbox



3D or 4D Jupyter in VS Code



<https://code.visualstudio.com/docs/python/jupyter-support>



```
classes=('plane','car','bird','cat',  
        'deer','dog','frog','horse','ship','truck')
```

<https://www.hanselman.com/blog/AnnouncingNETJupyterNotebooks.aspx>





Display exploration

```
[1]: class Customer{  
      public string FirstName{get;set;}  
      public string LastName{get;set;}  
    }  
    var oneCustomer = new Customer{FirstName="Raymond",LastName="Tang"};  
    display(oneCustomer);
```

FirstName	LastName
-----------	----------

Raymond	Tang
---------	------

```
[3]: var anotherCustomer = new Customer{FirstName="John",LastName="Citizen"};  
    var allCustomers = new []{oneCustomer,anotherCustomer};  
    display(allCustomers);
```

index	FirstName	LastName
-------	-----------	----------

0	Raymond	Tang
---	---------	------

1	John	Citizen
---	------	---------

```
[ ]:
```

Data Class Display

JupyterLab

localhost:8888/lab

File Edit View Run Kernel Tabs Settings Help

+

+

↑

↺

Name

Last Modified

cprogram

4 months ago

dfs

8 months ago

hadoop

7 months ago

output.csv

a month ago

python-examples

4 days ago

tensorflow_test

4 months ago

tensorflow-test

4 months ago

apache-hive-3.1.1-bin.tar.gz

a year ago

derby.log

7 months ago

example-spark-hive.py

7 months ago

fairscheduler-statedump.log

4 months ago

get-pip.py

4 months ago

hadoop-3.2.0.tar.gz

a year ago

mssql-jdbc-7.2.2.jre8.jar

9 months ago

packages-microsoft-prod.deb

8 months ago

spark-2.4.3-bin-hadoop2.7.tgz

8 months ago

sqoop-1.4.7.bin_hadoop-2.6.0.tar.gz

2 years ago

sqoop-1.4.7.tar.gz

2 years ago

start-hadoop.sh

7 months ago

start-metastore.sh

7 months ago

stop-hadoop.sh

7 months ago

test-pip.py

4 months ago

test-python.py

4 months ago

Launcher

Notebook

Python 3

.NET (C#)

.NET (F#)

Console

Python 3

.NET (C#)

.NET (F#)

Other

Terminal

Text File

Markdown File

Show Contextual Help

Launcher

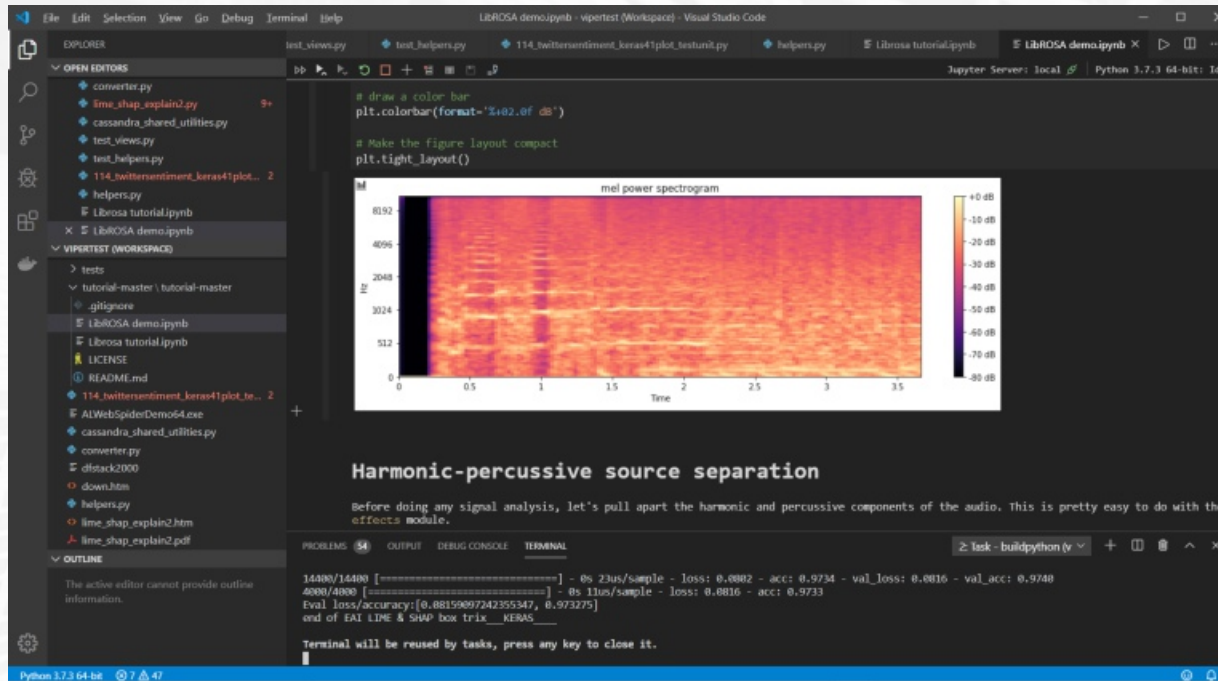
BASTA!

maxbox

19



Jupyter in VS Code



<https://maxbox4.wordpress.com/2020/01/26/jupyter-in-visual-studio-code/>





Links & Sources

- Almost all files:
- <https://matplotlib.org/>
- <https://www.sonarlint.org/vscode/>
- <https://www.graphviz.org/resources/>
-
- <https://sourceforge.net/projects/maxbox/files/Examples/EKON/BASTA2020/>
-
-
- <https://maxbox4.wordpress.com/blog/>
-
- <https://github.com/maxkleiner/maXbox4/releases>





max@kleiner.com
www.softwareschule.ch



 **BASTA!**

maXbox 