

Mon 10:09

xman

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README.md

```
$ ssh -Y pi@xxx.xxx.xxx.xxx
```

On Linux (most distributions have the X server installed), open a terminal

```
$ ssh -Y pi@xxx.xxx.xxx.xxx
```

X applications

```
$ sudo apt update
$ sudo apt install x11-apps
$ ico
$ oclock
$ xcalc
$ xclock
$ xeyes
$ xlogo
$ xman
```

Numpy array

```
$ python3
>>> import numpy as np
>>> a = np.arange(6)
>>> a
>>> b = np.arange(12).reshape(4, 3)
>>> b
>>> c = np.arange(24).reshape(2, 3, 4)
>>> c
>>> b.shape
>>> b.reshape(-1)
>>> b.reshape(-1, -1)
>>> d = np.array([20, 30, 40, 50])
>>> e = np.arange(4)
>>> f = d-e
>>> f
```

gabriel@gabriel-Lenovo-920-13IKB:~

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```
gabriel@gabriel-Lenovo-920-13IKB:~$ python3
Python 3.8.5 (default, Mar 15 2022, 13:55:28)
[GCC 8.4.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> import numpy as np
>>> a = np.arange(6)
>>> a
array([0, 1, 2, 3, 4, 5])
>>> b = np.arange(12).reshape(4, 3)
>>> b
array([[0, 1, 2],
       [3, 4, 5],
       [6, 7, 8],
       [9, 10, 11]])
>>> c = np.arange(24).reshape(2, 3, 4)
>>> c
array([[[0, 1, 2, 3],
         [4, 5, 6, 7],
         [8, 9, 10, 11]],
       [[12, 13, 14, 15],
         [16, 17, 18, 19],
         [20, 21, 22, 23]]])
>>> b.shape
(4, 3)
>>> b.reshape(-1)
array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11])
>>> b.reshape(-1, 1)
array([[0],
       [1],
       [2],
       [3],
       [4],
       [5],
       [6],
       [7],
       [8],
       [9],
       [10],
       [11]])
>>> b.reshape(2,-1)
array([[0, 1, 2, 3, 4, 5],
       [6, 7, 8, 9, 10, 11]])
>>> d = np.array([20, 30, 40, 50])
>>> e = np.arange(4)
>>> f = d-e
>>> f
array([20, 29, 28, 47])
>>> e**
array([0, 1, 4, 9])
>>> n = np.array([[1, 1], [0, 1]])
>>> n
```

Activities Terminal Mon 10:17 gabriel@gabriel-Lenovo-920-13IKB: ~

```

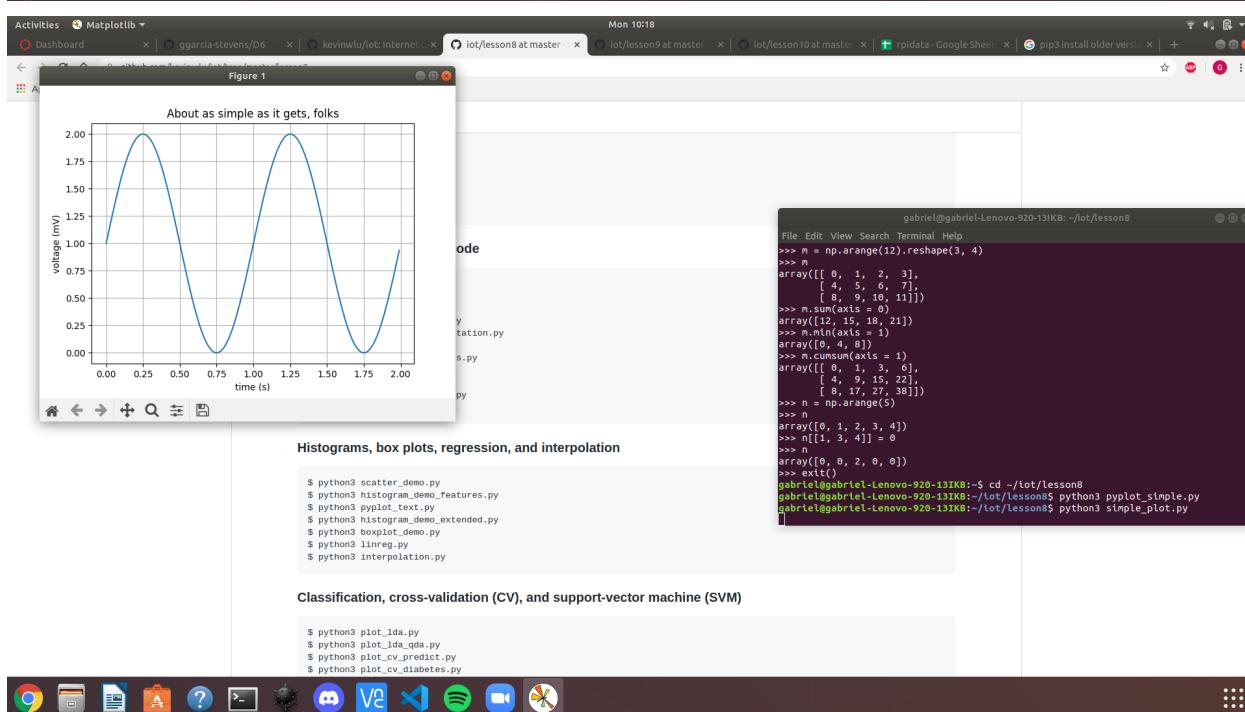
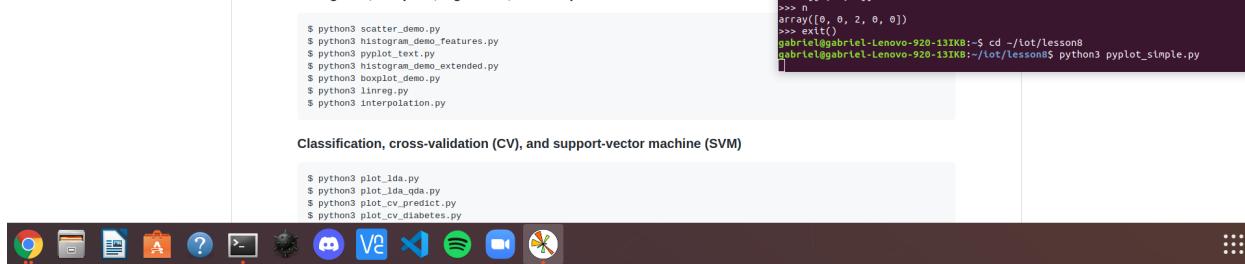
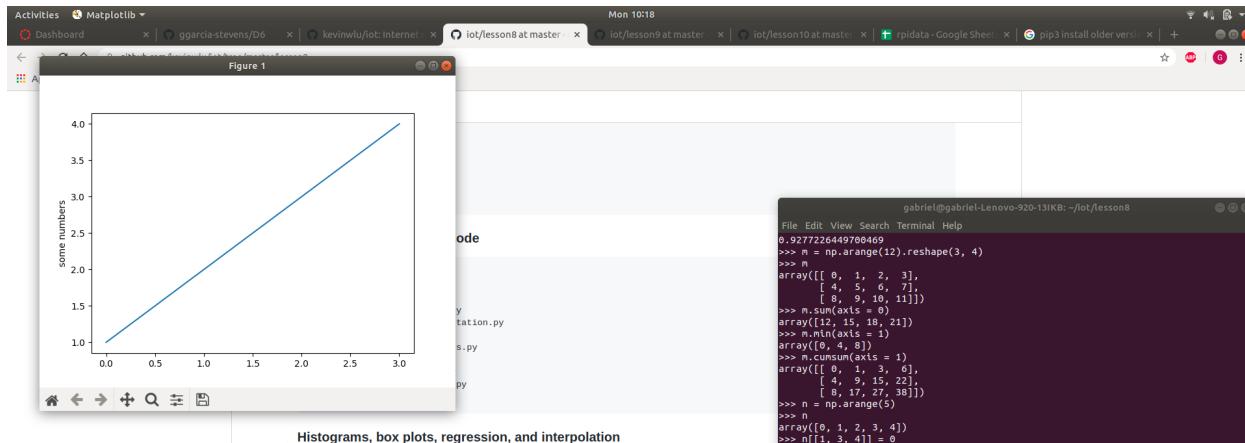
File Edit View Search Terminal Help
array([[ 0,  1,  2,  3,  4,  5],
       [ 6,  7,  8,  9, 10, 11]])
>>> d = np.array([20, 30, 40, 50])
>>> e = np.arange(4)
>>> f = d-e
>>> f
array([ 20,  29,  38,  47])
>>> e**2
array([ 0,  1,  4,  9])
>>> A = np.array([[1, 1], [0, 1]])
>>> B = np.array([[2, 0], [3, 4]])
>>> A*B
array([[ 2,  0],
       [ 0,  4]])
>>> A.dot(B)
array([[ 5,  4],
       [ 3,  4]])
>>> np.dot(A, B)
array([[ 5,  4],
       [ 3,  4]])
>>> g = np.ones((2, 3), dtype=int)
File <stdin>, line 1
    g = np.ones((2, 3), dtype=int)
IndentationError: unexpected indent
>>> g = np.ones((2, 3), dtype=int)
>>> g
array([[1, 1, 1],
       [1, 1, 1]])
>>> h = np.random.random((2, 3))
>>> h
array([[0.44570701, 0.49126563, 0.05729532],
       [0.05491222, 0.97446946, 0.36815266]])
>>> g *= 3
>>> g
array([[3, 3, 3],
       [3, 3, 3]])
>>> h += g
>>> g
array([[3, 3, 3],
       [3, 3, 3]])
>>> h
array([[3.44570701, 3.49126563, 3.05729532],
       [3.05491222, 3.97446946, 3.36815266]])
>>> k = np.random.random((2, 3))
>>> k
array([[0.92772264, 0.09111763, 0.18364838],
       [0.05461511, 0.7508767 , 0.23013887]])
>>> k.sum()
2.38119347511284

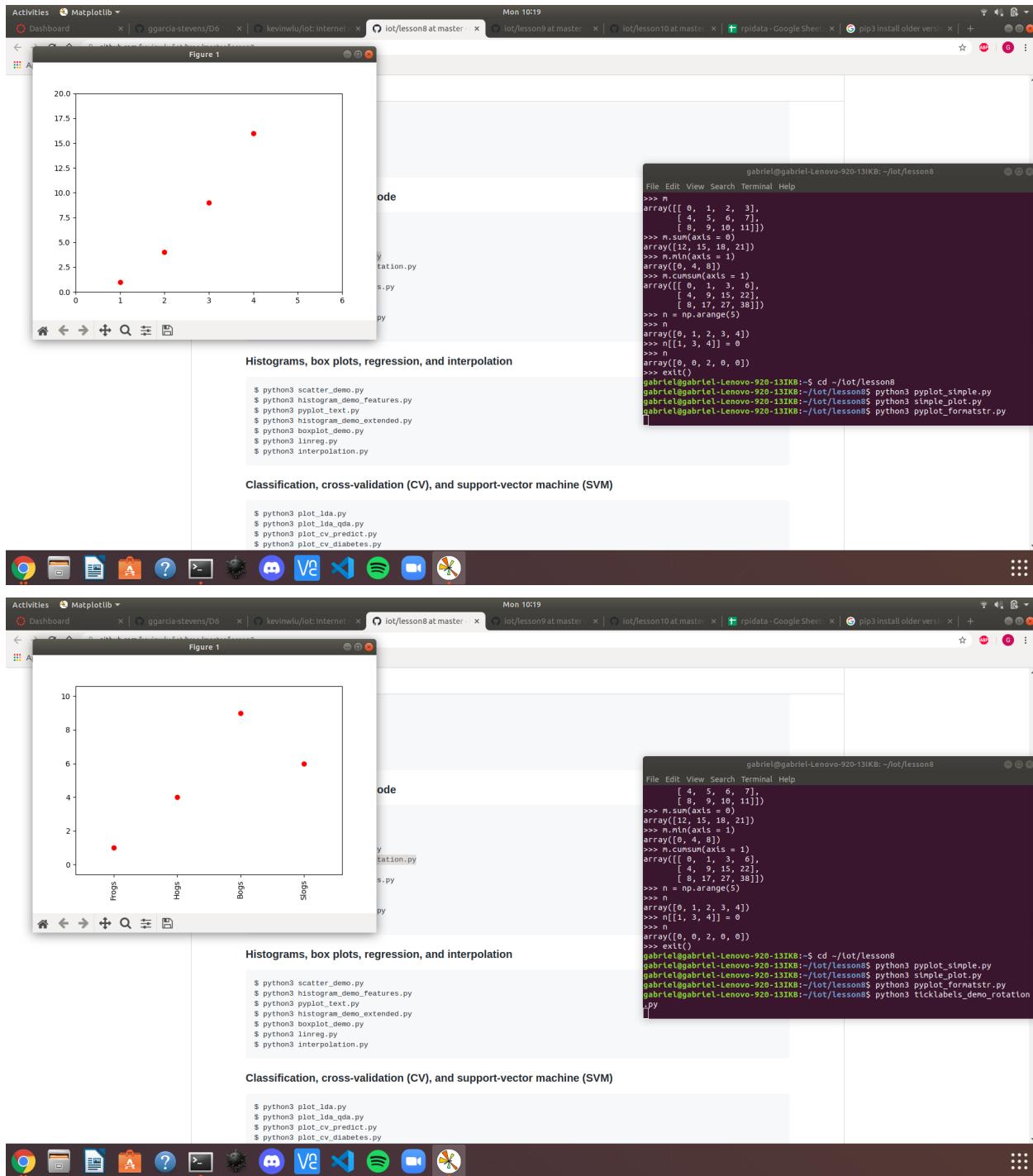
```

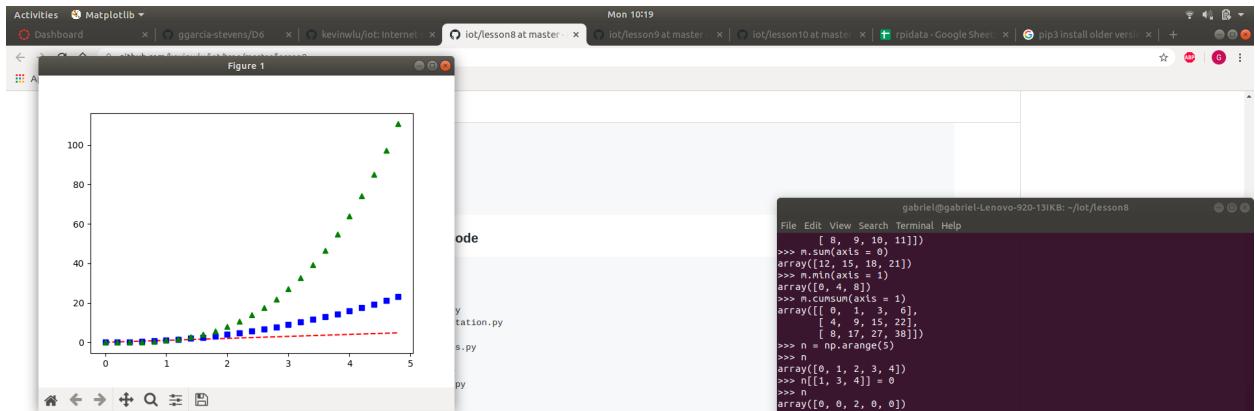
Activities Terminal Mon 10:17 gabriel@gabriel-Lenovo-920-13IKB: ~

```

File Edit View Search Terminal Help
>>> g
array([[ 1,  1,  1],
       [ 1,  1,  1]])
>>> h = np.random.random((2, 3))
>>> h
array([[0.44570701, 0.49126563, 0.05729532],
       [0.05491222, 0.97446946, 0.36815266]])
>>> g *= 3
>>> g
array([[3, 3, 3],
       [3, 3, 3]])
>>> h += g
>>> g
array([[3, 3, 3],
       [3, 3, 3]])
>>> h
array([[3.44570701, 3.49126563, 3.05729532],
       [3.05491222, 3.97446946, 3.36815266]])
>>> k = np.random.random((2, 3))
>>> k
array([[0.92772264, 0.09111763, 0.18364838],
       [0.05461511, 0.7508767 , 0.23013887]])
>>> k.sum()
2.38119347511284
>>> k.min()
0.05461511429273935
>>> k.max()
0.9277226449700469
>>> m = np.arange(12).reshape(3, 4)
>>> m
array([[ 0,  1,  2,  3],
       [ 4,  5,  6,  7],
       [ 9, 10, 11]])
>>> m.sum(axis=0)
array([ 12,  15,  18,  21])
>>> m.min(axis=1)
array([ 0,  4,  8])
>>> m.cumsum(axis=1)
array([[ 0,  1,  3,  6],
       [ 4,  5,  9, 12],
       [ 9, 17, 21, 30]])
>>> n = np.arange(5)
>>> n
array([ 0,  1,  2,  3,  4])
>>> n[[1, 3, 4]] = 0
>>> n
array([ 0,  0,  2,  0,  0])
>>> exit()
gabriel@gabriel-Lenovo-920-13IKB:~
```







Histograms, box plots, regression, and interpolation

```

$ python3 scatter_demo.py
$ python3 histogram_demo_features.py
$ python3 pyplot_text.py
$ python3 histogram_demo_extended.py
$ python3 boxplot_demo.py
$ python3 linreg.py
$ python3 interpolation.py

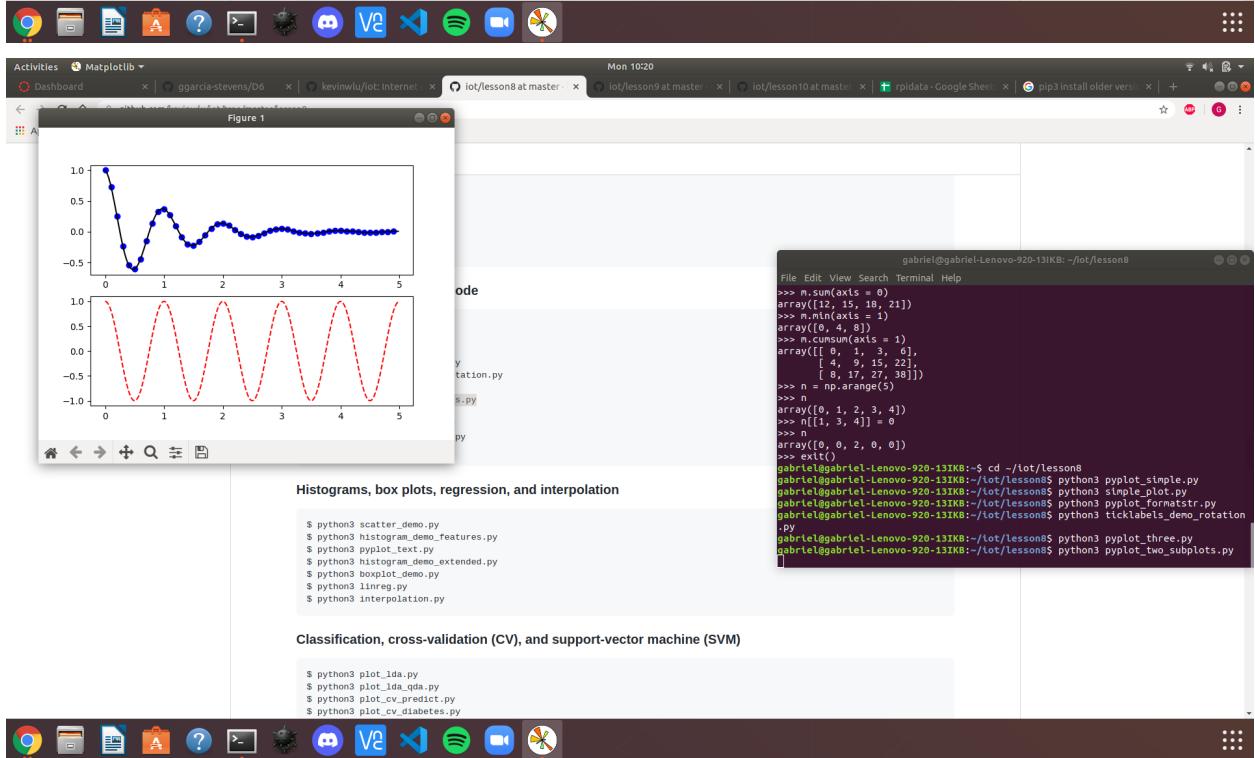
```

Classification, cross-validation (CV), and support-vector machine (SVM)

```

$ python3 plot_lda.py
$ python3 plot_lda_qda.py
$ python3 plot_cv_predict.py
$ python3 plot_cv_diabetes.py

```



Histograms, box plots, regression, and interpolation

```

$ python3 scatter_demo.py
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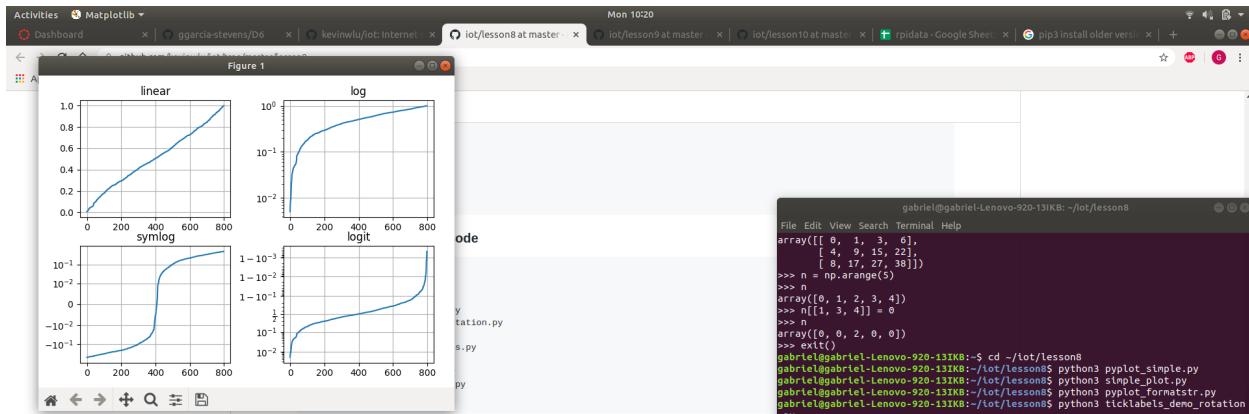
```

Classification, cross-validation (CV), and support-vector machine (SVM)

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$ python3 plot_lda.py
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```



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```

Classification, cross-validation (CV), and support-vector machine (SVM)

```
$ python3 plot_lda.py
$ python3 plot_lda_qda.py
$ python3 plot_cv_predict.py
$ python3 plot_cv_diabetes.py
```



```
File Edit View Search Terminal Help
[ 4,  9, 15, 22],
[ 8, 17, 27, 38])
>>> n = np.arange(5)
>>> n
array([ 0,  1,  2,  3,  4])
>>> n[[1, 3, 4]] = 0
>>> n
array([ 0,  0,  2,  0,  0])
>>> exit()
gabriel@gabriel-Lenovo-920-13IKB:~/iot/lesson8
gabriel@gabriel-Lenovo-920-13IKB:~/iot/lesson8$ python3 pyplot_simple.py
gabriel@gabriel-Lenovo-920-13IKB:~/iot/lesson8$ python3 simple_plot.py
gabriel@gabriel-Lenovo-920-13IKB:~/iot/lesson8$ python3 pyplot_formatstr.py
gabriel@gabriel-Lenovo-920-13IKB:~/iot/lesson8$ python3 ticklabels_demo_rotation
.py
gabriel@gabriel-Lenovo-920-13IKB:~/iot/lesson8$ python3 pyplot_three.py
gabriel@gabriel-Lenovo-920-13IKB:~/iot/lesson8$ python3 pyplot_two_subplots.py
gabriel@gabriel-Lenovo-920-13IKB:~/iot/lesson8$ python3 pyplot_scales.py
pyplot_scales.py:37: MatplotlibDeprecationWarning: The 'linthreshy' parameter of
`_init_()` has been renamed 'linthresh' since Matplotlib 3.3; support for the o
ld name will be dropped two minor releases later.
  plt.yscale('symlog', linthreshy=0.01)
gabriel@gabriel-Lenovo-920-13IKB:~/iot/lesson8$ python3 pyplot_annotation.py
```

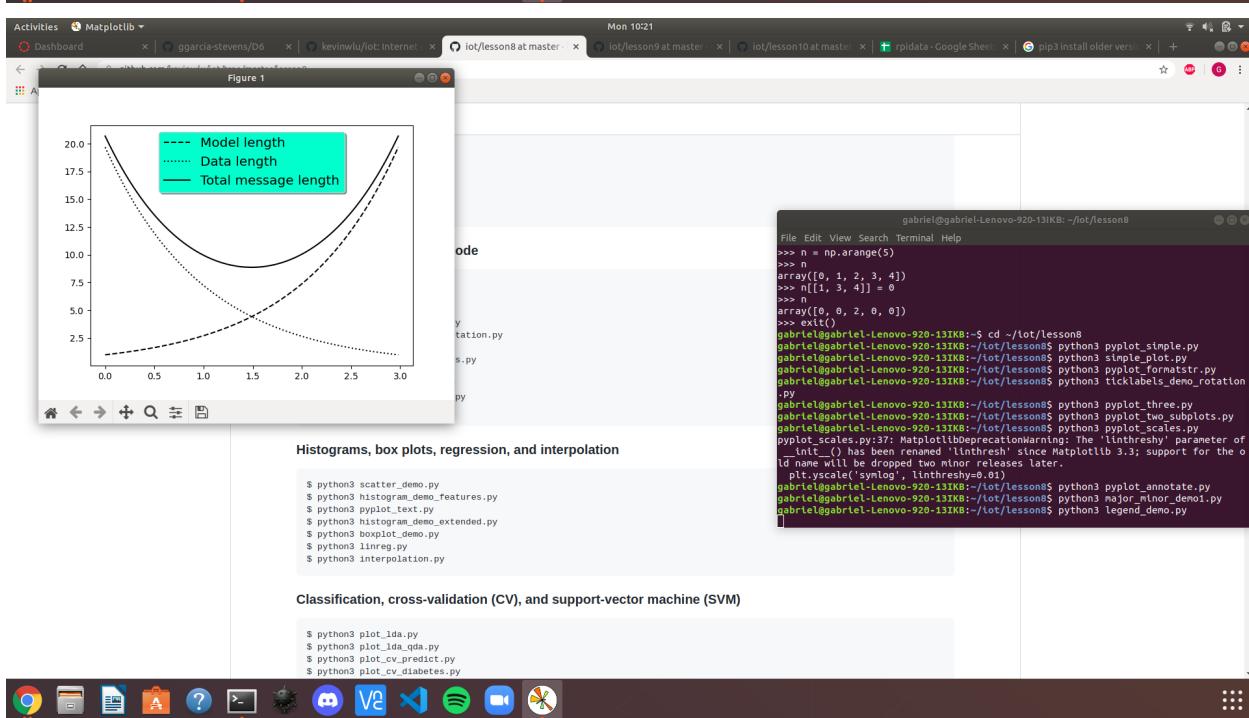
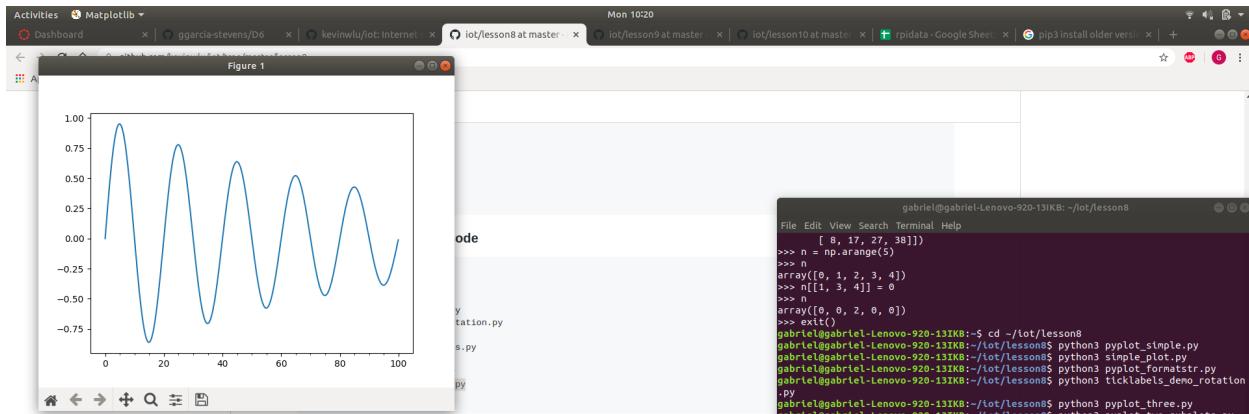
Histograms, box plots, regression, and interpolation

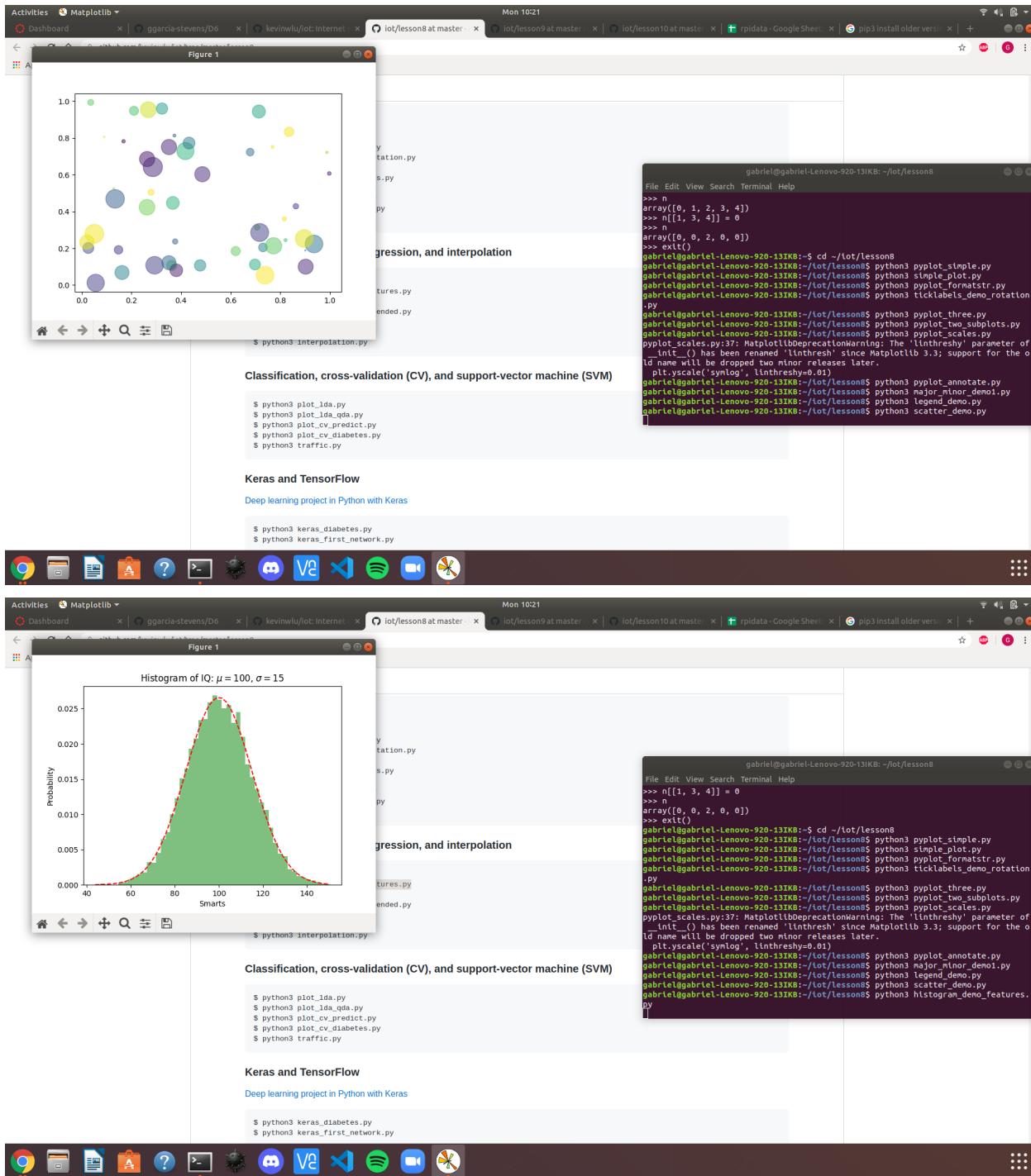
```
$ python3 scatter_demo.py
$ python3 histogram_demo_features.py
$ python3 pyplot_text.py
$ python3 histogram_demo_extended.py
$ python3 boxplot_demo.py
$ python3 linreg.py
$ python3 interpolation.py
```

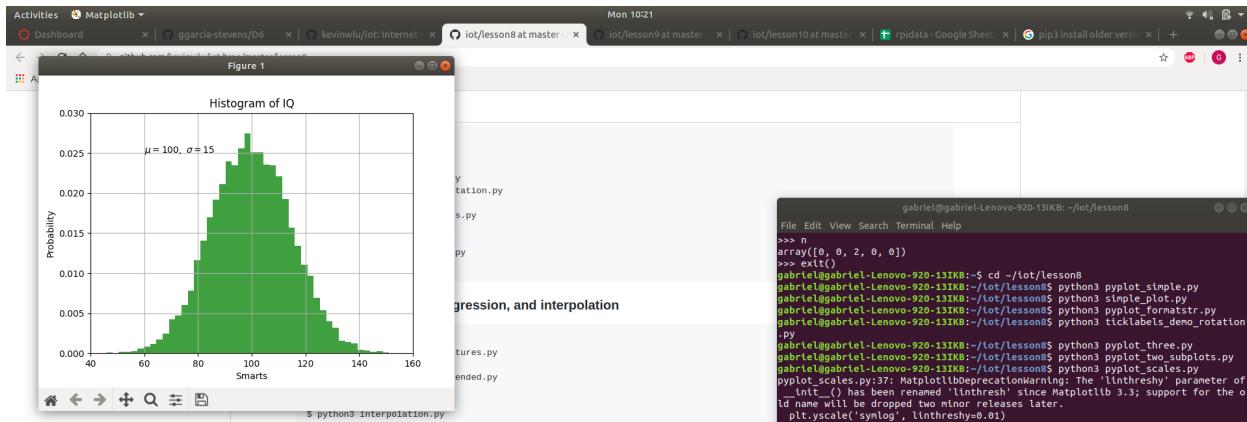
Classification, cross-validation (CV), and support-vector machine (SVM)

```
$ python3 plot_lda.py
$ python3 plot_lda_qda.py
$ python3 plot_cv_predict.py
$ python3 plot_cv_diabetes.py
```









Classification, cross-validation (CV), and support-vector machine (SVM)

```

$ python3 knn_id3.py
$ python3 plot_id3_qda.py
$ python3 plot_cv_predict.py
$ python3 plot_cv_diabetes.py
$ python3 traffic.py

```

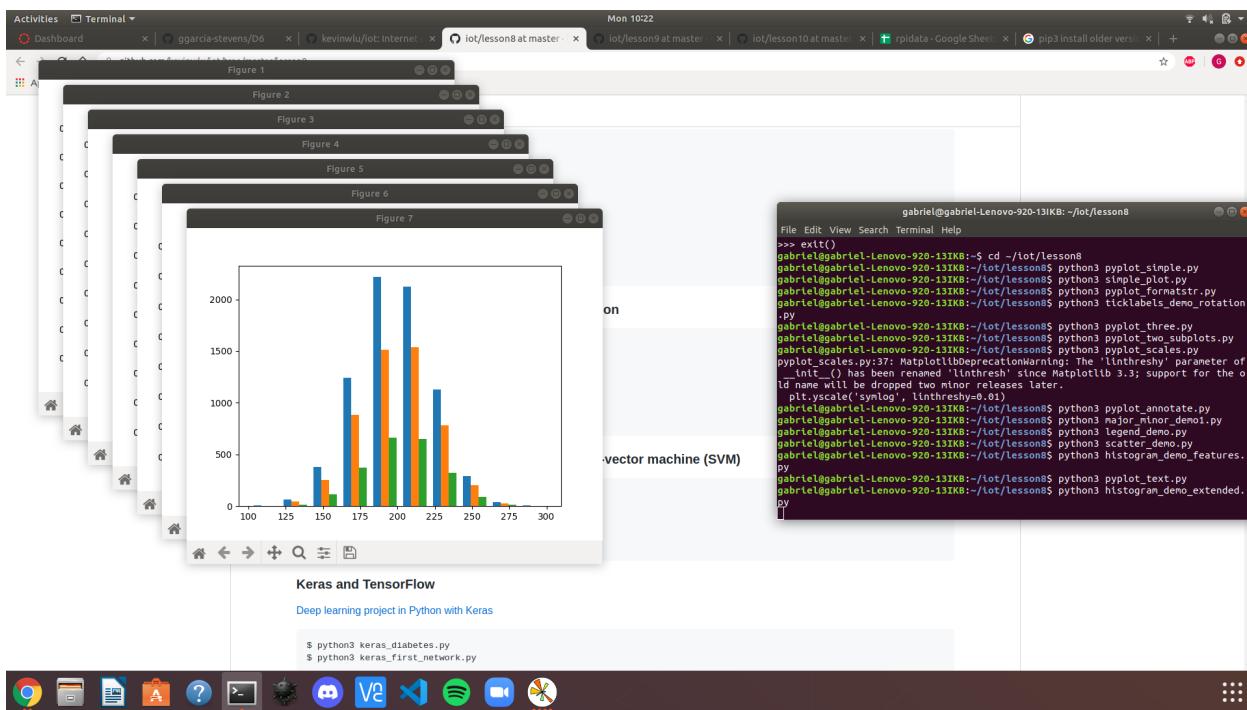
Keras and TensorFlow

Deep learning project in Python with Keras

```

$ python3 keras_diabetes.py
$ python3 keras_first_network.py

```



Support vector machine (SVM)

Keras and TensorFlow

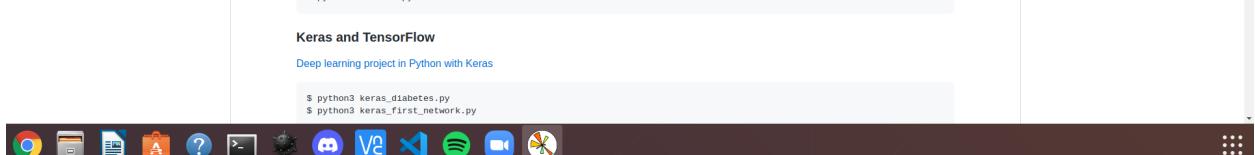
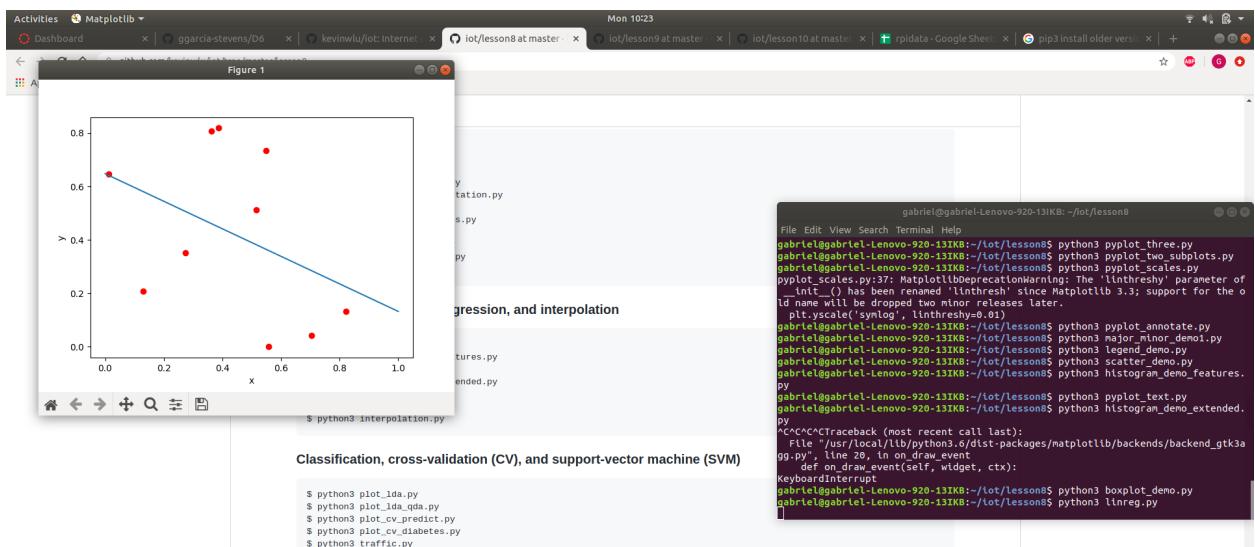
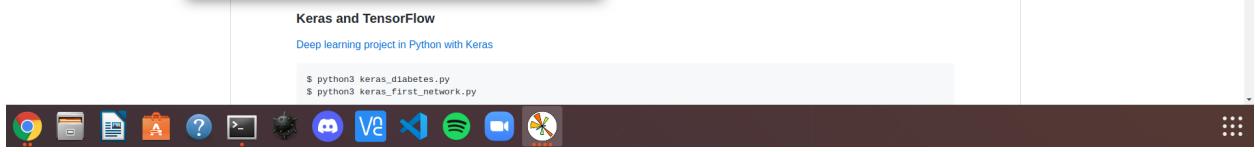
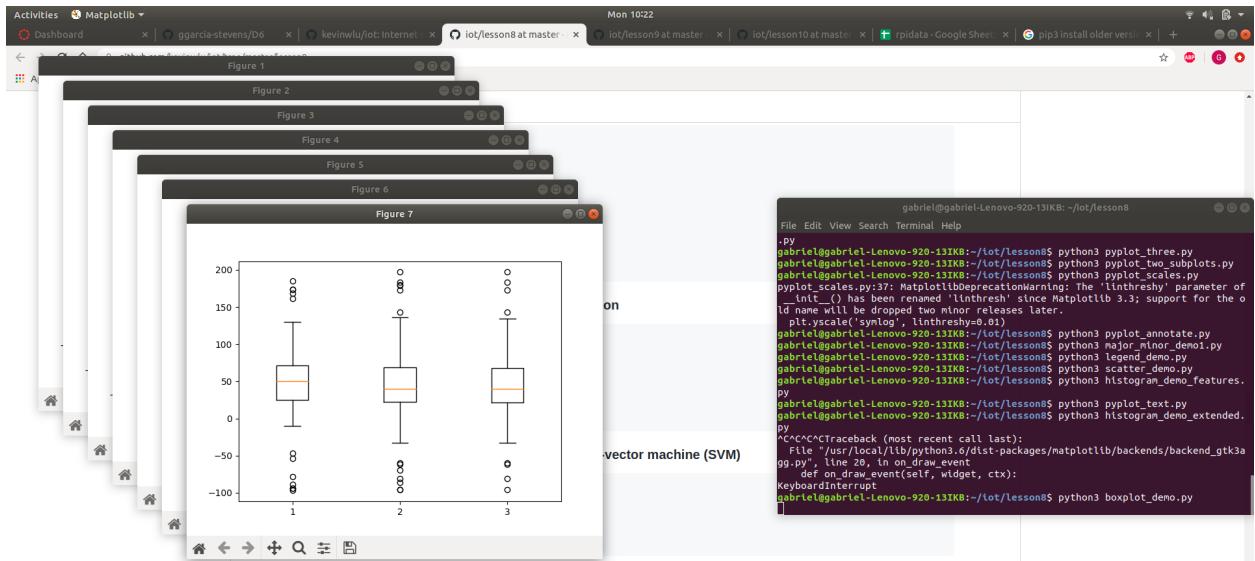
Deep learning project in Python with Keras

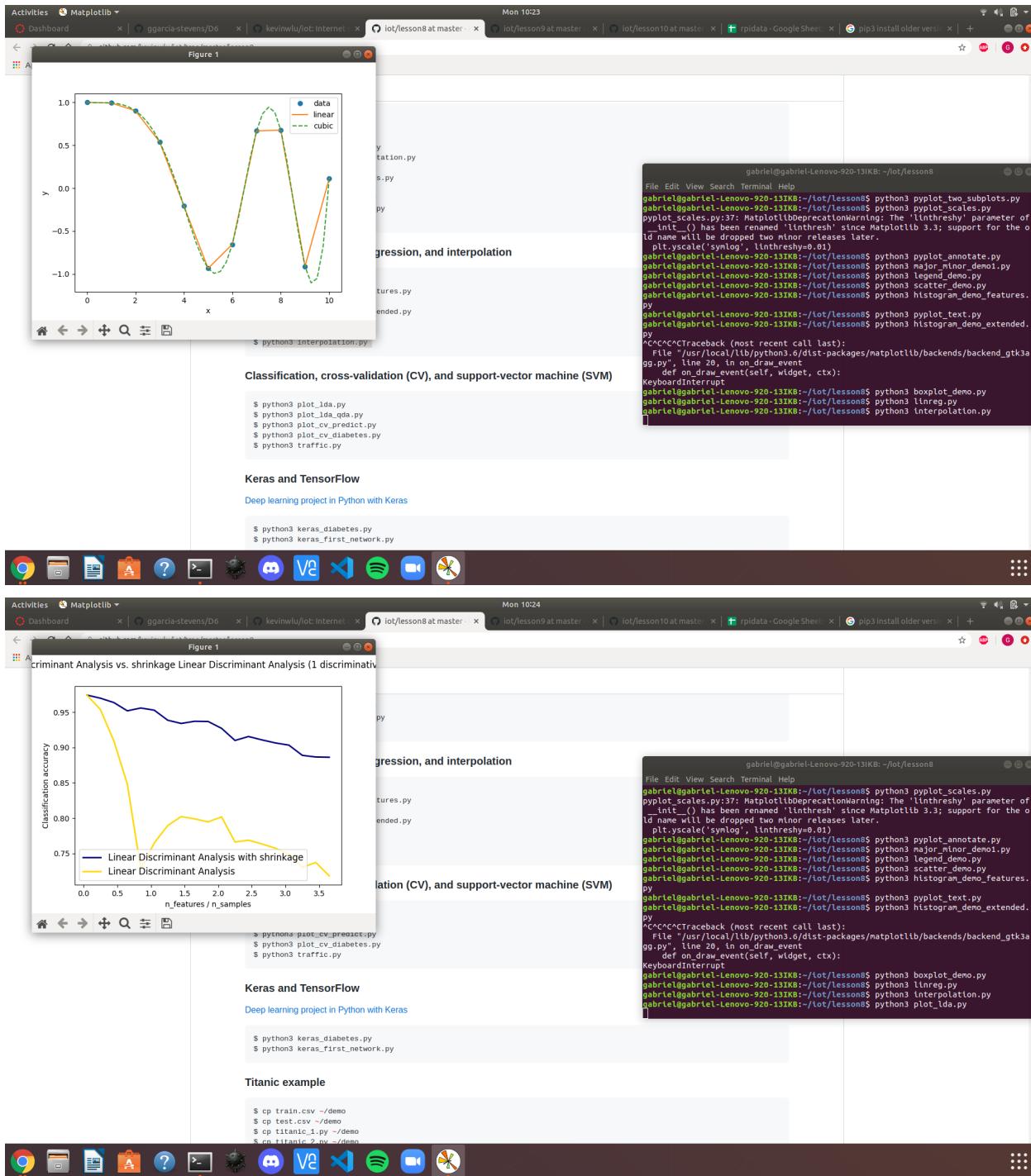
```

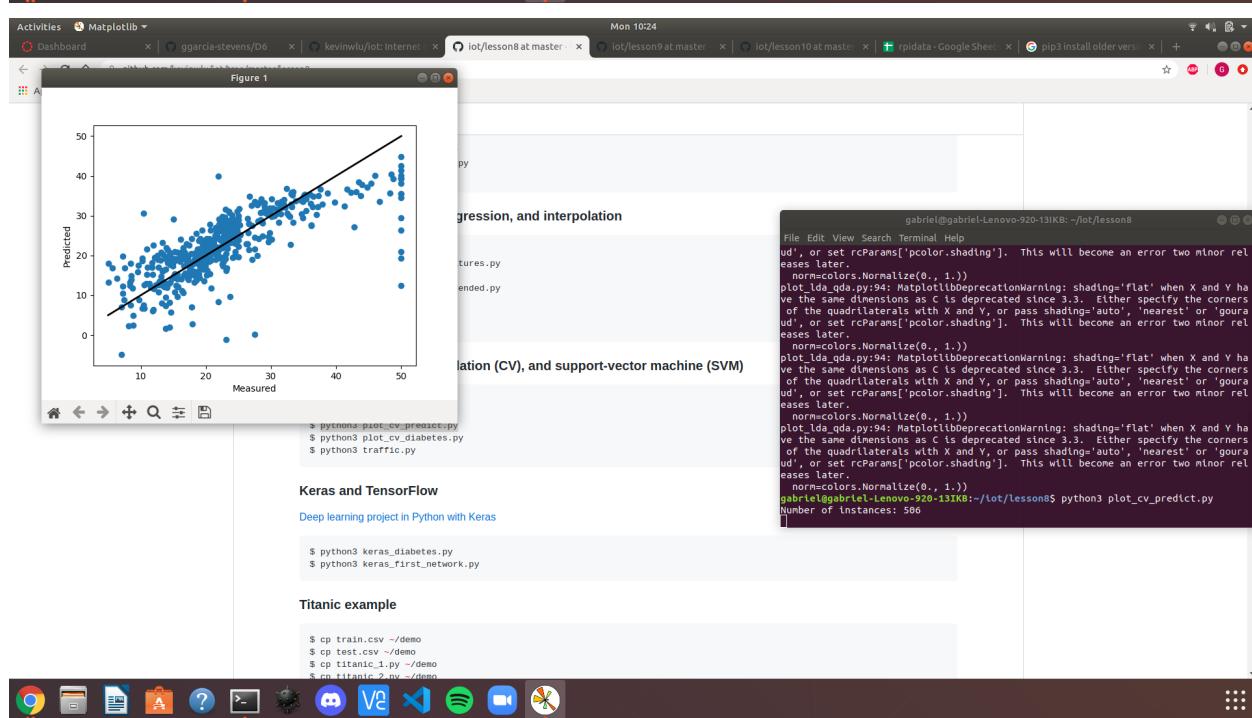
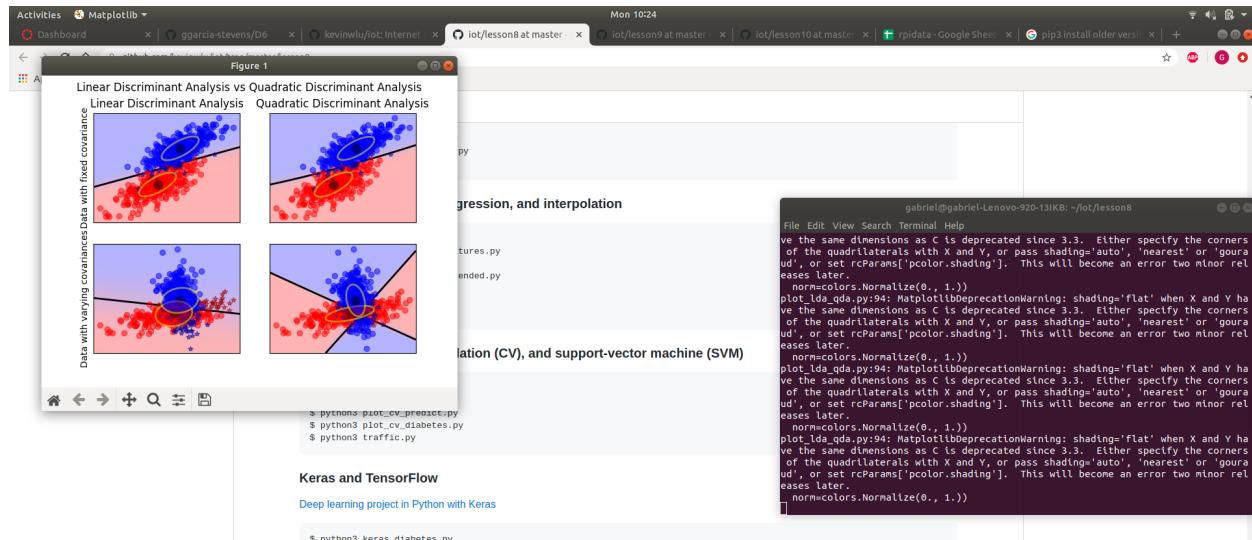
$ python3 keras_diabetes.py
$ python3 keras_first_network.py

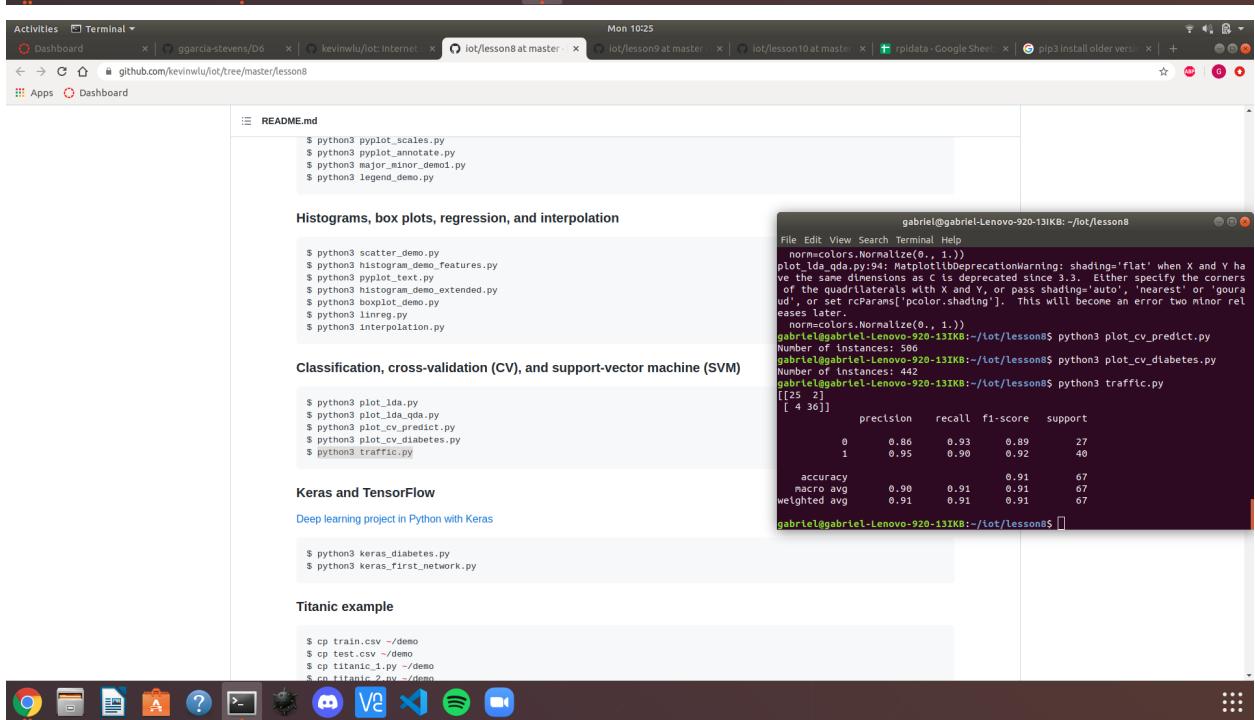
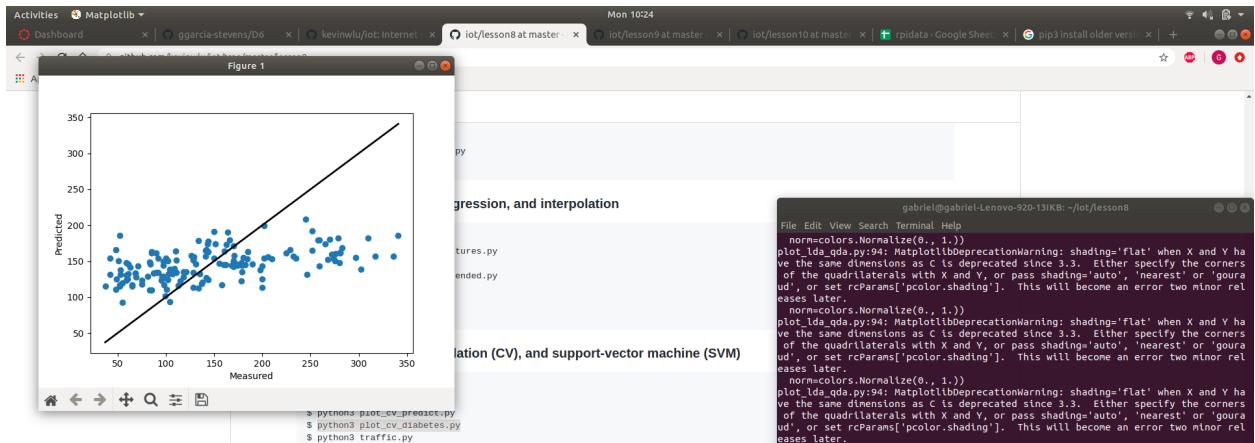
```











```
Activities Terminal Mon 10:26
gabriel@gabriel-Lenovo-920-13IKB: ~/lot/lesson8

File Edit View Search Terminal Help
Epoch 127/150
77/77 [=====] - 0s 837us/step - loss: 0.4900 - accuracy: 0.7656
Epoch 128/150
77/77 [=====] - 0s 829us/step - loss: 0.4853 - accuracy: 0.7708
Epoch 129/150
77/77 [=====] - 0s 828us/step - loss: 0.4884 - accuracy: 0.7773
Epoch 130/150
77/77 [=====] - 0s 827us/step - loss: 0.4874 - accuracy: 0.7812
Epoch 131/150
77/77 [=====] - 0s 825us/step - loss: 0.5082 - accuracy: 0.7422
Epoch 132/150
77/77 [=====] - 0s 813us/step - loss: 0.4870 - accuracy: 0.7578
Epoch 133/150
77/77 [=====] - 0s 821us/step - loss: 0.4746 - accuracy: 0.7695
Epoch 134/150
77/77 [=====] - 0s 808us/step - loss: 0.4938 - accuracy: 0.7565
Epoch 135/150
77/77 [=====] - 0s 829us/step - loss: 0.4956 - accuracy: 0.7526
Epoch 136/150
77/77 [=====] - 0s 830us/step - loss: 0.4793 - accuracy: 0.7617
Epoch 137/150
77/77 [=====] - 0s 831us/step - loss: 0.4910 - accuracy: 0.7513
Epoch 138/150
77/77 [=====] - 0s 843us/step - loss: 0.4877 - accuracy: 0.7565
Epoch 139/150
77/77 [=====] - 0s 827us/step - loss: 0.4805 - accuracy: 0.7643
Epoch 140/150
77/77 [=====] - 0s 833us/step - loss: 0.4829 - accuracy: 0.7656
Epoch 141/150
77/77 [=====] - 0s 808us/step - loss: 0.4885 - accuracy: 0.7656
Epoch 142/150
77/77 [=====] - 0s 841us/step - loss: 0.4792 - accuracy: 0.7721
Epoch 143/150
77/77 [=====] - 0s 825us/step - loss: 0.4806 - accuracy: 0.7721
Epoch 144/150
77/77 [=====] - 0s 817us/step - loss: 0.4835 - accuracy: 0.7721
Epoch 145/150
77/77 [=====] - 0s 830us/step - loss: 0.4913 - accuracy: 0.7591
Epoch 146/150
77/77 [=====] - 0s 825us/step - loss: 0.4858 - accuracy: 0.7617
Epoch 147/150
77/77 [=====] - 0s 833us/step - loss: 0.4853 - accuracy: 0.7617
Epoch 148/150
77/77 [=====] - 0s 822us/step - loss: 0.4825 - accuracy: 0.7552
Epoch 149/150
77/77 [=====] - 0s 812us/step - loss: 0.4850 - accuracy: 0.7643
Epoch 150/150
77/77 [=====] - 0s 820us/step - loss: 0.4776 - accuracy: 0.7852
24/24 [=====] - 0s 487us/step - loss: 0.4728 - accuracy: 0.7799
Accuracy: 77.99
gabriel@gabriel-Lenovo-920-13IKB: ~/lot/lesson8$
```

