Live 2025-10-22a

October 22, 2025

1 Classification on Iris Data

[1]:

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

[2]:

```
X = sns.load_dataset('iris')
```

[3]:

```
y = X.species
X = X.drop('species',axis=1)
```

[4]:

```
X.head()
```

[4]:

```
   sepal_length  sepal_width  petal_length  petal_width
0           5.1          3.5           1.4          0.2
1           4.9          3.0           1.4          0.2
2           4.7          3.2           1.3          0.2
3           4.6          3.1           1.5          0.2
4           5.0          3.6           1.4          0.2
```

[5]:

```
y.head()
```

[5]:

```
0    setosa
1    setosa
2    setosa
3    setosa
4    setosa
Name: species, dtype: object
```

X is now the matrix with the feature values

y is a series with the target value for each set of features

Let's use y as the target values

Target could be: * discrete values * number (integers) * boolean * strings * continous * floating point number * e.g. error (with threshold == binary) * e.g. wear of the device (with treshold ==

binary / typically good / medium / bad or with prediction when threshold will be exceeded == remaining useful life (RUL))

Here we have a discrete target.

The ML - Task can be * Classification (discrete targets) * Regression (continous targets)

So we will do a classification.

[8]:

```
from sklearn import svm

clf = svm.SVC(random_state=42)

clf.fit(X,y)
```

[8]:

```
SVC(random_state=42)
```

[10]:

```
y_pred = pd.Series(clf.predict(X)) # strictly speaking this is stupid! We␣
 ↪should use unseen data!
```

Now we have a prediction. We can and should compare it to our target values (ground truth).

[13]:

```
cor = (y == y_pred).sum()
ncor = (y != y_pred).sum()
acc = cor / (cor + ncor)
print(f"Correct: {cor}")
print(f"Not cor: {ncor}")

print(f"Accuracy = {acc}")
```

```
Correct: 146
Not cor: 4
Accuracy = 0.9733333333333334
```

[15]:

```
from sklearn.metrics import accuracy_score

print(accuracy_score(y,y_pred))
```

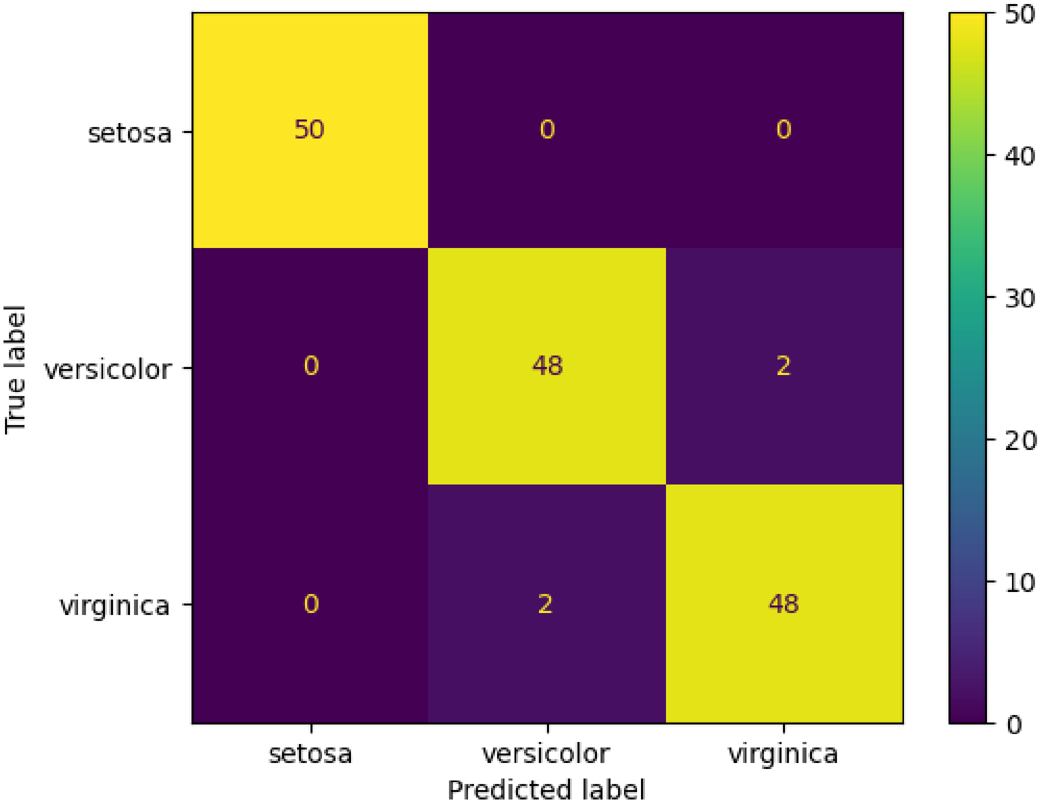
```
0.9733333333333334
```

[17]:

```
from sklearn.metrics import ConfusionMatrixDisplay

cmd = ConfusionMatrixDisplay.from_estimator(clf,X,y)

plt.show()
```


setosa
versicolor
virginica
True label
50
0
0
0
48
2
0
2
48
setosa
versicolor
virginica
Predicted label
50
40
30
20
10
0

```
[ ]:
```