

```
import numpy as np
!pip install lime
import lime
import lime.lime_tabular
from sklearn.datasets import load_iris
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestClassifier

iris = load_iris()
X = iris.data
y = iris.target

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

rf_clf = RandomForestClassifier(n_estimators=100, random_state=42)
rf_clf.fit(X_train, y_train)

explainer = lime.lime_tabular.LimeTabularExplainer(X_train, feature_names=iris.feature_names, class_names=iris.target_names)

sample_idx = 0
sample_instance = X_test[sample_idx]

explanation = explainer.explain_instance(sample_instance, rf_clf.predict_proba, num_features=len(iris.feature_names))

print('Predicted Class:', iris.target_names[rf_clf.predict([sample_instance])[0]])
print('True Class:', iris.target_names[y_test[sample_idx]])
print('\nExplanation for the Prediction:')
for feature, weight in explanation.as_list():
    print(f"{feature}: {weight}")
```

Collecting lime

Downloading lime-0.2.0.1.tar.gz (275 kB)

275.7/275.7 kB 2.3 MB/s eta 0:00:00

Preparing metadata (setup.py) ... done

Requirement already satisfied: matplotlib in /usr/local/lib/python3.10/dist-packages (from lime) (3.7.1)

Requirement already satisfied: numpy in /usr/local/lib/python3.10/dist-packages (from lime) (1.25.2)

Requirement already satisfied: scipy in /usr/local/lib/python3.10/dist-packages (from lime) (1.11.4)

Requirement already satisfied: tqdm in /usr/local/lib/python3.10/dist-packages (from lime) (4.66.2)

Requirement already satisfied: scikit-learn>=0.18 in /usr/local/lib/python3.10/dist-packages (from lime) (1.2.2)

Requirement already satisfied: scikit-image>=0.12 in /usr/local/lib/python3.10/dist-packages (from lime) (0.19.3)

Requirement already satisfied: networkx>=2.2 in /usr/local/lib/python3.10/dist-packages (from scikit-image>=0.12->lime) (3.2.1)

Requirement already satisfied: pillow!=7.1.0,!=7.1.1,!=8.3.0,>=6.1.0 in /usr/local/lib/python3.10/dist-packages (from scikit-image>=0.12->lime) (9.0.0)

Requirement already satisfied: imageio>=2.4.1 in /usr/local/lib/python3.10/dist-packages (from scikit-image>=0.12->lime) (2.31.6)

Requirement already satisfied: tifffile>=2019.7.26 in /usr/local/lib/python3.10/dist-packages (from scikit-image>=0.12->lime) (2024.2.12)

Requirement already satisfied: PyWavelets>=1.1.1 in /usr/local/lib/python3.10/dist-packages (from scikit-image>=0.12->lime) (1.5.0)

Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from scikit-image>=0.12->lime) (24.0)

Requirement already satisfied: joblib>=1.1.1 in /usr/local/lib/python3.10/dist-packages (from scikit-learn>=0.18->lime) (1.3.2)

Requirement already satisfied: threadpoolctl>=2.0.0 in /usr/local/lib/python3.10/dist-packages (from scikit-learn>=0.18->lime) (3.4.0)

Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib->lime) (1.2.0)

Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packages (from matplotlib->lime) (0.12.1)

Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib->lime) (4.50.0)

Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib->lime) (1.4.5)

Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib->lime) (3.1.2)

Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (from matplotlib->lime) (2.8.2)

Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.7->matplotlib->lime) (1.16.0)

Building wheels for collected packages: lime

Building wheel for lime (setup.py) ... done

Created wheel for lime: filename=lime-0.2.0.1-py3-none-any.whl size=283835 sha256=2663e3b5f78a149b94f816e9135bfc3e86301c3b038dfb543a3e3c9daac5494

Stored in directory: /root/.cache/pip/wheels/fd/a2/af/9ac0a1a85a27f314a06b39e1f492bee1547d52549a4606ed89

Successfully built lime

Installing collected packages: lime

Successfully installed lime-0.2.0.1

Predicted Class: versicolor

True Class: versicolor

Explanation for the Prediction:

4.25 < petal length (cm) <= 5.10: 0.21313418751370067

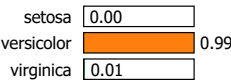
0.30 < petal width (cm) <= 1.30: 0.1717773520665013

5.75 < sepal length (cm) <= 6.40: 0.02775616414693026

sepal width (cm) <= 2.80: -0.009880027463249405

explanation.show\_in\_notebook()

Prediction probabilities



NOT versicolor

versicolor

