

```
In [2]: import pandas as pd
"diagnosis":["strep","allergy","cold","strep","cold","allergy","strep","allergy"]
```

```
In [18]: data={"sore":[1,0,1,1,0,0,0,1,0,1],
"fever":[1,0,1,0,1,0,0,0,1,1],
"swollen":[1,0,0,1,0,0,1,0,0,0],
"congestion":[1,1,1,0,1,1,0,1,1,1],
"headache":[1,1,0,0,0,0,0,1,1,1],
"diagnosis":[0,1,2,0,2,1,0,1,2,2]}
```

```
In [49]: df=pd.DataFrame(data)
df
```

-----  
**AttributeError** Traceback (most recent call last)

Cell In[49], line 2

```
1 df=pd.DataFrame(data)
----> 2 df.feature_names
```

File ~\AppData\Local\Programs\Python\Python310\lib\site-packages\pandas\core\generic.py:5902, in NDFrame.\_\_getattr\_\_(self, name)

```
5895 if (
5896     name not in self._internal_names_set
5897     and name not in self._metadata
5898     and name not in self._accessors
5899     and self._info_axis._can_hold_identifiers_and_holds_name(name)
5900 ):
5901     return self[name]
-> 5902 return object.__getattr__(self, name)
```

**AttributeError:** 'DataFrame' object has no attribute 'feature\_names'

```
In [36]: y=df["diagnosis"]
y
```

```
Out[36]: 0    0
1    1
2    2
3    0
4    2
5    1
6    0
7    1
8    2
9    2
Name: diagnosis, dtype: int64
```

```
In [30]: x=df.drop(columns=["diagnosis"])
x
```

```
Out[30]:
```

	sore	fever	swollen	congestion	headache
0	1	1	1	1	1
1	0	0	0	1	1
2	1	1	0	1	0
3	1	0	1	0	0
4	0	1	0	1	0
5	0	0	0	1	0
6	0	0	1	0	0
7	1	0	0	1	1
8	0	1	0	1	1
9	1	1	0	1	1

```
In [ ]:
```

```
In [11]: pip install numpy scipy scikit-learn
```

```
Requirement already satisfied: numpy in c:\users\admin\appdata\local\programs\python\python310\lib\site-packages (1.24.1)
Collecting scipy
  Downloading scipy-1.10.0-cp310-cp310-win_amd64.whl (42.5 MB)
  ----- 42.5/42.5 MB 6.2 MB/s eta 0:00:00
Collecting scikit-learn
  Downloading scikit_learn-1.2.0-cp310-cp310-win_amd64.whl (8.2 MB)
  ----- 8.2/8.2 MB 5.6 MB/s eta 0:00:00
Collecting joblib>=1.1.1
  Downloading joblib-1.2.0-py3-none-any.whl (297 kB)
  ----- 298.0/298.0 kB 4.6 MB/s eta 0:00:00
Collecting threadpoolctl>=2.0.0
  Downloading threadpoolctl-3.1.0-py3-none-any.whl (14 kB)
Installing collected packages: threadpoolctl, scipy, joblib, scikit-learn
Successfully installed joblib-1.2.0 scikit-learn-1.2.0 scipy-1.10.0 threadpoolctl-3.1.0
Note: you may need to restart the kernel to use updated packages.
```

```
In [51]: from sklearn.tree import DecisionTreeClassifier
from sklearn.model_selection import train_test_split
```

```
In [43]: dtree=DecisionTreeClassifier(criterion="entropy")
```

In [44]: `dtree.fit(x,y)`

Out[44]:

```
DecisionTreeClassifier
DecisionTreeClassifier(criterion='entropy')
```

In [45]: `dtree.predict([[0,0,1,0,0]])`

C:\Users\Admin\AppData\Local\Programs\Python\Python310\lib\site-packages\sklearn\base.py:409: UserWarning: X does not have valid feature names, but DecisionTreeClassifier was fitted with feature names  
warnings.warn(

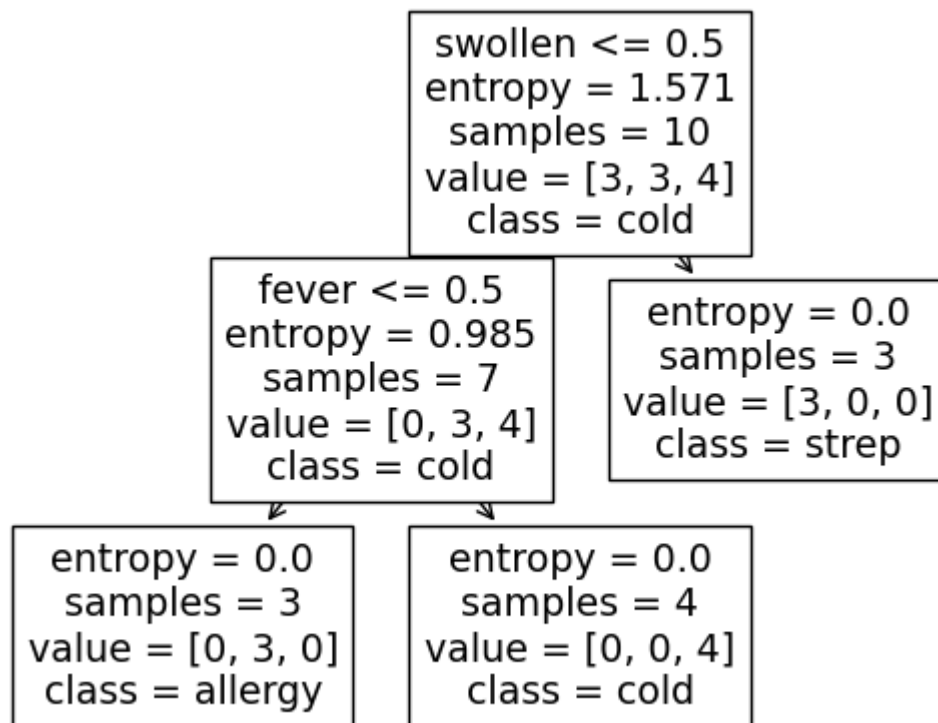
Out[45]: `array([0], dtype=int64)`

In [34]: `pip install -U matplotlib`

```
Collecting matplotlib
  Downloading matplotlib-3.6.2-cp310-cp310-win_amd64.whl (7.2 MB)
    ----- 7.2/7.2 MB 9.0 MB/s eta 0:00:00
Requirement already satisfied: python-dateutil>=2.7 in c:\users\admin\appdata\local\programs\python\python310\lib\site-packages (from matplotlib) (2.8.2)
Requirement already satisfied: packaging>=20.0 in c:\users\admin\appdata\local\programs\python\python310\lib\site-packages (from matplotlib) (22.0)
Collecting cyclor>=0.10
  Downloading cyclor-0.11.0-py3-none-any.whl (6.4 kB)
Collecting contourpy>=1.0.1
  Downloading contourpy-1.0.6-cp310-cp310-win_amd64.whl (163 kB)
    ----- 163.6/163.6 kB 4.9 MB/s eta 0:00:00
Collecting kiwisolver>=1.0.1
  Downloading kiwisolver-1.4.4-cp310-cp310-win_amd64.whl (55 kB)
    ----- 55.3/55.3 kB 3.0 MB/s eta 0:00:00
Collecting pyparsing>=2.2.1
  Downloading pyparsing-3.0.9-py3-none-any.whl (98 kB)
    ----- 98.3/98.3 kB 2.8 MB/s eta 0:00:00
Collecting fonttools>=4.22.0
  Downloading fonttools-4.38.0-py3-none-any.whl (965 kB)
    ----- 965.4/965.4 kB 7.6 MB/s eta 0:00:00
Collecting pillow>=6.2.0
  Downloading Pillow-9.4.0-cp310-cp310-win_amd64.whl (2.5 MB)
    ----- 2.5/2.5 MB 7.5 MB/s eta 0:00:00
Requirement already satisfied: numpy>=1.19 in c:\users\admin\appdata\local\programs\python\python310\lib\site-packages (from matplotlib) (1.24.1)
Requirement already satisfied: six>=1.5 in c:\users\admin\appdata\local\programs\python\python310\lib\site-packages (from python-dateutil>=2.7->matplotlib) (1.16.0)
Installing collected packages: pyparsing, pillow, kiwisolver, fonttools, cyclor, contourpy, matplotlib
Successfully installed contourpy-1.0.6 cyclor-0.11.0 fonttools-4.38.0 kiwisolver-1.4.4 matplotlib-3.6.2 pillow-9.4.0 pyparsing-3.0.9
Note: you may need to restart the kernel to use updated packages.
```

In [61]: `tree.plot_tree(dtree, feature_names=["sore", "fever", "swollen", "congestion", "headache"])`

Out[61]: [Text(0.6, 0.8333333333333334, 'swollen <= 0.5\nentropy = 1.571\nsamples = 10\nvalue = [3, 3, 4]\n\nclass = cold'),  
Text(0.4, 0.5, 'fever <= 0.5\nentropy = 0.985\nsamples = 7\nvalue = [0, 3, 4]\n\nclass = cold'),  
Text(0.2, 0.16666666666666666, 'entropy = 0.0\nsamples = 3\nvalue = [0, 3, 0]\n\nclass = allergy'),  
Text(0.6, 0.16666666666666666, 'entropy = 0.0\nsamples = 4\nvalue = [0, 0, 4]\n\nclass = cold'),  
Text(0.8, 0.5, 'entropy = 0.0\nsamples = 3\nvalue = [3, 0, 0]\n\nclass = strep')]



In [58]: `import matplotlib.pyplot as plt  
from sklearn import tree`

In [56]:

```
Collecting tree
  Downloading Tree-0.2.4.tar.gz (6.5 kB)
  Preparing metadata (setup.py): started
  Preparing metadata (setup.py): finished with status 'done'
Requirement already satisfied: Pillow in c:\users\admin\appdata\local\programs\python\python310\lib\site-packages (from tree) (9.4.0)
Collecting svgwrite
  Downloading svgwrite-1.4.3-py3-none-any.whl (67 kB)
----- 67.1/67.1 kB 729.3 kB/s eta 0:00:00
Requirement already satisfied: setuptools in c:\users\admin\appdata\local\programs\python\python310\lib\site-packages (from tree) (63.2.0)
Collecting click
  Downloading click-8.1.3-py3-none-any.whl (96 kB)
----- 96.6/96.6 kB 1.8 MB/s eta 0:00:00
Requirement already satisfied: colorama in c:\users\admin\appdata\local\program s\python\python310\lib\site-packages (from click->tree) (0.4.6)
Installing collected packages: svgwrite, click, tree
  Running setup.py install for tree: started
  Running setup.py install for tree: finished with status 'done'
Successfully installed click-8.1.3 svgwrite-1.4.3 tree-0.2.4
Note: you may need to restart the kernel to use updated packages.
```

DEPRECATION: tree is being installed using the legacy 'setup.py install' method, because it does not have a 'pyproject.toml' and the 'wheel' package is not installed. pip 23.1 will enforce this behaviour change. A possible replacement is to enable the '--use-pep517' option. Discussion can be found at <https://github.com/pypa/pip/issues/8559> (<https://github.com/pypa/pip/issues/8559>)

In [ ]: