```
# IMPORTING LIBRARIES
import numpy as np
import pandas as pd
import seaborn as sns
sns.set_palette('husl')
import matplotlib.pyplot as plt
%matplotlib inline
from sklearn.model_selection import train_test_split
from sklearn.model_selection import cross_val_score
from sklearn.model_selection import StratifiedKFold
from sklearn.metrics import classification_report
from sklearn.metrics import accuracy_score
from sklearn.linear_model import LogisticRegression
from sklearn.tree import DecisionTreeClassifier
from sklearn.neighbors import KNeighborsClassifier
from sklearn.discriminant_analysis import LinearDiscriminantAnalysis
from sklearn.naive_bayes import GaussianNB
from sklearn.svm import SVC
```

```
url = 'https://raw.githubusercontent.com/jbrownlee/Datasets/master/iris.csv'
```

```
col_name = ['sepal-lenght','sepal-width','petal-lenght','petal-width','class']
```

```
dataset = pd.read_csv(url, names = col_name)
```

```
dataset.shape
```

```
(150, 5)
```

```
dataset.head()
```

| | sepal-lenght | sepal-width | petal-lenght | petal-width | class |
|---|---|---|---|---|---|
| **0** | 5.1 | 3.5 | 1.4 | 0.2 | Iris-setosa |
| **1** | 4.9 | 3.0 | 1.4 | 0.2 | Iris-setosa |
| **2** | 4.7 | 3.2 | 1.3 | 0.2 | Iris-setosa |
| **3** | 4.6 | 3.1 | 1.5 | 0.2 | Iris-setosa |
| **4** | 5.0 | 3.6 | 1.4 | 0.2 | Iris-setosa |

```
dataset.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 150 entries, 0 to 149
Data columns (total 5 columns):
 #   Column        Non-Null Count  Dtype  
---  ------        --------------  -----  
 0   sepal-lenght  150 non-null    float64
 1   sepal-width   150 non-null    float64
 2   petal-lenght  150 non-null    float64
 3   petal-width   150 non-null    float64
 4   class         150 non-null    object 
dtypes: float64(4), object(1)
memory usage: 6.0+ KB
```

```
dataset.describe()
```

| | sepal-lenght | sepal-width | petal-lenght | petal-width |
|---|---|---|---|---|
| **count** | 150.000000 | 150.000000 | 150.000000 | 150.000000 |
| **mean** | 5.843333 | 3.054000 | 3.758667 | 1.198667 |
| **std** | 0.828066 | 0.433594 | 1.764420 | 0.763161 |
| **min** | 4.300000 | 2.000000 | 1.000000 | 0.100000 |
| **25%** | 5.100000 | 2.800000 | 1.600000 | 0.300000 |
| **50%** | 5.800000 | 3.000000 | 4.350000 | 1.300000 |
| **75%** | 6.400000 | 3.300000 | 5.100000 | 1.800000 |
| **max** | 7.900000 | 4.400000 | 6.900000 | 2.500000 |

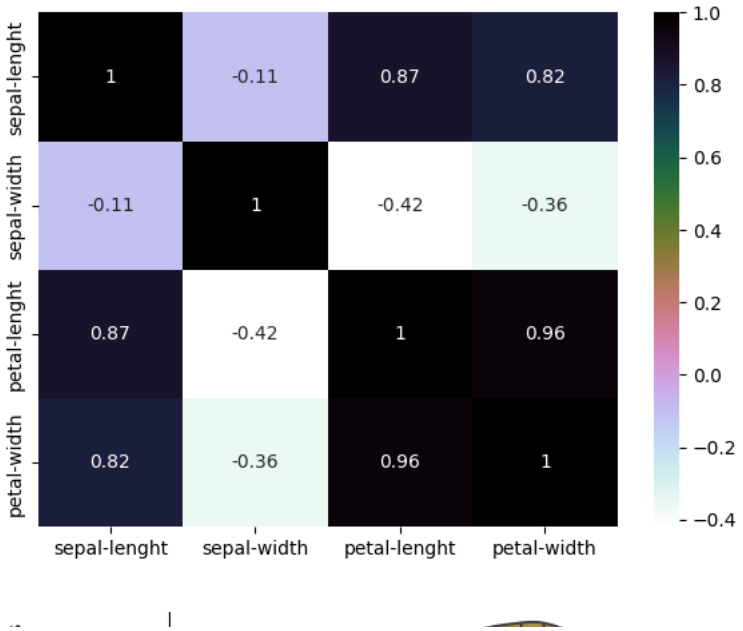
```
dataset['class'].value_counts()
```

```
Iris-setosa        50
Iris-versicolor    50
Iris-virginica     50
Name: class, dtype: int64
```

```
sns.violinplot(y='class', x='sepal-lenght', data=dataset, inner='quartile')
plt.show()
sns.violinplot(y='class', x='sepal-width', data=dataset, inner='quartile')
plt.show()
sns.violinplot(y='class', x='petal-lenght', data=dataset, inner='quartile')
plt.show()
sns.violinplot(y='class', x='petal-width', data=dataset, inner='quartile')
plt.show()
```

```
plt.figure(figsize=(7,5))
sns.heatmap(dataset.corr(), annot=True, cmap='cubehelix_r')
plt.show()
```

```
<ipython-input-12-5996ae93e555>:2: FutureWarning: The default value of numeric_only in DataFrame.corr is deprecated. In a future ver
  sns.heatmap(dataset.corr(), annot=True, cmap='cubehelix_r')
```




```
X = dataset.drop(['class'], axis=1)
y = dataset['class']
print(f'X shape: {X.shape} | y shape: {y.shape} ')
```

```
X shape: (150, 4) | y shape: (150,)
```

```
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.20, random_state=1)
```

```
models = []
models.append(('LR', LogisticRegression()))
models.append(('LDA', LinearDiscriminantAnalysis()))
models.append(('KNN', KNeighborsClassifier()))
models.append(('CART', DecisionTreeClassifier()))
models.append(('NB', GaussianNB()))
models.append(('SVC', SVC(gamma='auto')))
# evaluate each model in turn
results = []
model_names = []
for name, model in models:
kfold = StratifiedKFold(n_splits=10, random_state=1, shuffle=True)
cv_results = cross_val_score(model, X_train, y_train, cv=kfold, scoring='accuracy')
results.append(cv_results)
model_names.append(name)
print('%s: %f (%f)' % (name, cv_results.mean(), cv_results.std()))
```

```
  File "<ipython-input-16-425e0727cb3f>", line 12
    kfold = StratifiedKFold(n_splits=10, random_state=1, shuffle=True)
    ^
IndentationError: expected an indented block after 'for' statement on line 11
```

SEARCH STACK OVERFLOW

petal-width

```
model = SVC(gamma='auto')
model.fit(X_train, y_train)
prediction = model.predict(X_test)


print(f'Test Accuracy: {accuracy_score(y_test, prediction)}')
print(f'Classification Report: \n {classification_report(y_test, prediction)}')
```

```
Test Accuracy: 0.9666666666666667
Classification Report:
                  precision    recall  f1-score   support

     Iris-setosa       1.00      1.00      1.00        11
 Iris-versicolor       1.00      0.92      0.96        13
  Iris-virginica       0.86      1.00      0.92         6

        accuracy                           0.97        30
       macro avg       0.95      0.97      0.96        30
    weighted avg       0.97      0.97      0.97        30
```