In [1]:
```
import numpy as np
import matplotlib.pyplot as plt
import matplotlib.image as mpimg
import pandas as pd
from sklearn.metrics import confusion_matrix,classification_report
import seaborn as sns
```

In [2]:
```
dataset = pd.read_csv('iris.csv')
```

In [6]:
```
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_length  150 non-null    float64
 1   sepal_width   150 non-null    float64
 2   petal_length  150 non-null    float64
 3   petal_width   150 non-null    float64
 4   species       150 non-null    object 
dtypes: float64(4), object(1)
memory usage: 6.0+ KB
```

In [3]:
```
dataset
```

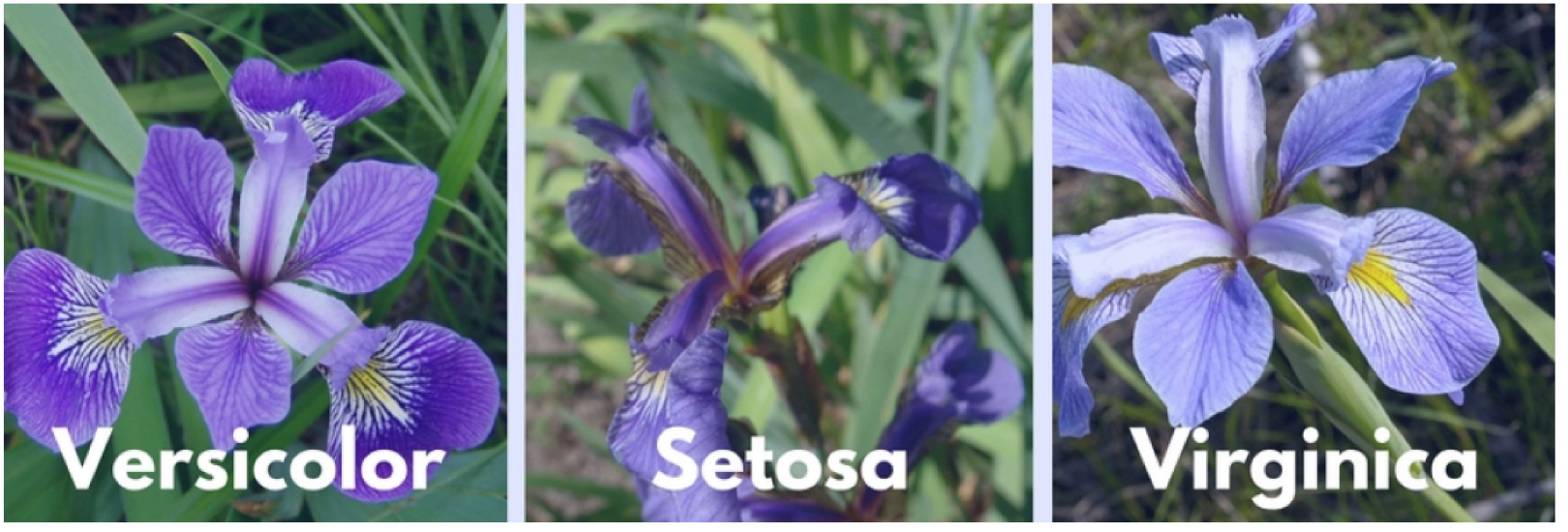
Out[3]:

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa
...	...	...	...	...	...
145	6.7	3.0	5.2	2.3	virginica
146	6.3	2.5	5.0	1.9	virginica
147	6.5	3.0	5.2	2.0	virginica
148	6.2	3.4	5.4	2.3	virginica
149	5.9	3.0	5.1	1.8	virginica

150 rows × 5 columns

In [4]:
```
%matplotlib inline
img=mpimg.imread('iris_types.jpg')
plt.figure(figsize=(20,40))
plt.axis('off')
plt.imshow(img)
```

Out[4]:
```
<matplotlib.image.AxesImage at 0x292464818d0>
```



In [5]:
```
X = dataset.iloc[:,:4].values # it will select 4 columns in x
y = dataset['species'].values
```

In [27]:
```
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size = 0.20, random_state = 82)
```

In [28]:
```
# Feature Scaling to bring the variable in a single scale
from sklearn.preprocessing import StandardScaler
sc = StandardScaler()
X_train = sc.fit_transform(X_train)
X_test = sc.transform(X_test)
```

Using Linear Kernel.

In [29]:
```
# Fitting SVC Classification to the Training set with linear kernel
from sklearn.svm import SVC
```

```
svcclassifier = SVC(kernel = 'linear', random_state = 0)
svcclassifier.fit(X_train, y_train)
```

Out[29]:
```
SVC(kernel='linear', random_state=0)
```

In [30]:
```
# Predicting the Test set results
y_pred = svcclassifier.predict(X_test)
print(y_pred)
```

```
['virginica' 'virginica' 'setosa' 'setosa' 'setosa' 'virginica'
 'versicolor' 'versicolor' 'virginica' 'versicolor' 'versicolor'
 'virginica' 'setosa' 'setosa' 'setosa' 'setosa' 'virginica' 'versicolor'
 'setosa' 'versicolor' 'setosa' 'virginica' 'setosa' 'virginica'
 'virginica' 'versicolor' 'virginica' 'setosa' 'virginica' 'versicolor']
```

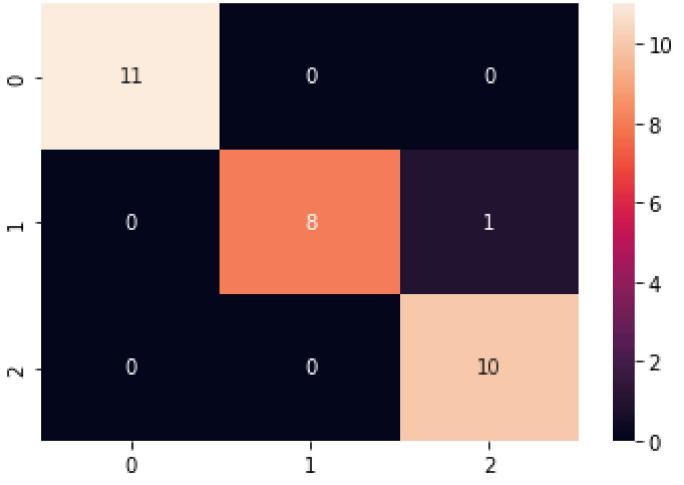
In [31]:
```
#lets see the actual and predicted value side by side
y_compare = np.vstack((y_test,y_pred)).T
#actual value on the left side and predicted value on the right hand side
#printing the top 5 values
y_compare[:5,:]
```

Out[31]:
```
array([['virginica', 'virginica'],
       ['virginica', 'virginica'],
       ['setosa', 'setosa'],
       ['setosa', 'setosa'],
       ['setosa', 'setosa']], dtype=object)
```

In [32]:
```
# Making the Confusion Matrix
```

In [33]:
```
cm = confusion_matrix(y_test, y_pred)
sns.heatmap(cm, annot=True)
```

Out[33]:
```
<AxesSubplot:>
```



In [34]:
```
print(classification_report(y_true=y_test, y_pred = y_pred))
```

```
              precision    recall  f1-score   support

      setosa       1.00      1.00      1.00        11
  versicolor       1.00      0.89      0.94         9
   virginica       0.91      1.00      0.95        10

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

Using polynomial kernel

In [35]:
```
# Fitting SVC Classification to the Training set with linear kernel
from sklearn.svm import SVC
svcclassifier = SVC(kernel = 'poly', random_state = 0)
svcclassifier.fit(X_train, y_train)
```

```
# Predicting the Test set results
y_pred = svcclassifier.predict(X_test)
print(y_pred)
```

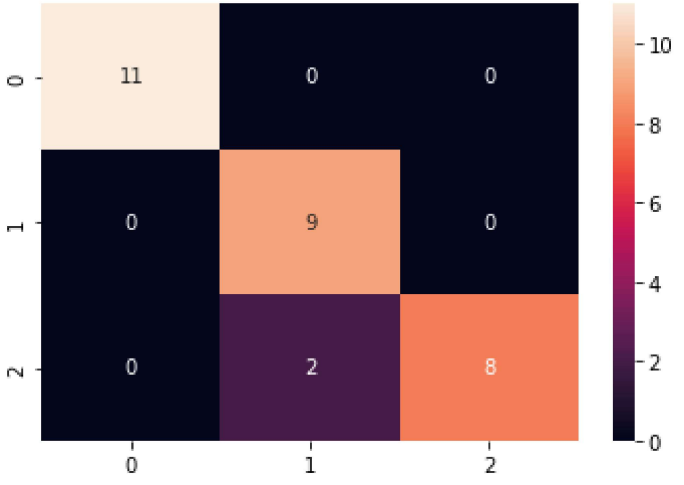
```
['virginica' 'virginica' 'setosa' 'setosa' 'setosa' 'versicolor'
 'versicolor' 'versicolor' 'versicolor' 'versicolor' 'versicolor'
 'versicolor' 'setosa' 'setosa' 'setosa' 'setosa' 'virginica' 'versicolor'
 'setosa' 'versicolor' 'setosa' 'virginica' 'setosa' 'virginica'
 'virginica' 'versicolor' 'virginica' 'setosa' 'virginica' 'versicolor']
```

In [36]:
```
#lets see the actual and predicted value side by side
y_compare = np.vstack((y_test,y_pred)).T
#actual value on the left side and predicted value on the right hand side
#printing the top 5 values
y_compare[:5,:]
```

Out[36]:
```
array([['virginica', 'virginica'],
       ['virginica', 'virginica'],
       ['setosa', 'setosa'],
       ['setosa', 'setosa'],
       ['setosa', 'setosa']], dtype=object)
```

In [37]:
```
cm = confusion_matrix(y_test, y_pred)
sns.heatmap(cm, annot=True)
```

Out[37]:
```
<AxesSubplot:>
```



In [38]:
```
print(classification_report(y_true=y_test, y_pred = y_pred))
```

```
              precision    recall  f1-score   support

      setosa       1.00      1.00      1.00        11
  versicolor       0.82      1.00      0.90         9
   virginica       1.00      0.80      0.89        10

    accuracy                           0.93        30
   macro avg       0.94      0.93      0.93        30
weighted avg       0.95      0.93      0.93        30
```

In [ ]: