```
import os
import pandas as pd


s = ’https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data’
print(’URL:’, s)
df = pd.read_csv(s, header=None, encoding=’utf-8’)
df.tail(5)



from google.colab import files
uploaded = files.upload()
import io
df2 = pd.read_csv(io.BytesIO(uploaded[’iris2.data’]))
df2.tail(5)

# Commented out IPython magic to ensure Python compatibility.
import numpy as np

y = df.iloc[0:100, 4].values
y = np.where(y == ’Iris-setosa’, -1, 1)

X = df.iloc[0:100, [0, 2]].values
# %matplotlib inline
import matplotlib.pyplot as plt

plt.scatter(X[:50, 0], X[:50, 1], color=’red’, marker=’o’, label=’setosa’)
plt.scatter(X[50:100, 0], X[50:100, 1], color=’blue’, marker=’x’, label=’versicolor’)

plt.xlabel(’sepal length [cm]’)
plt.ylabel(’petal length [cm]’)
plt.legend(loc=’upper left’)

plt.show()

class Perceptron(object):
    def __init__(self, eta=1, n_iter=50, random_state=1):
        self.eta=eta
        self.n_iter=n_iter
        self.random_state=random_state

    def fit(self, X, y):
        rgen = np.random.RandomState(self.random_state)
        self.w_ = rgen.normal(loc=0.0, scale=0.01, size=X.shape[1] + 1)
        self.errors_ = []

        for _ in range(self.n_iter):
            errors = 0
            for xi, target in zip(X, y):
                update = self.eta * (target - self.predict(xi))
                self.w_[1:] += update * xi
                self.w_[0] += update
                errors += int(update != 0.0)
            self.errors_.append(errors)
        return self

    def net_input(self, X):
      return np.dot(X, self.w_[1:]) + self.w_[0]

    def predict(self, X):
        return np.where(self.net_input(X) >= 0.0, 1, -1)

ppn = Perceptron(eta=0.1, n_iter=10)
ppn.fit(X, y)
plt.plot(range(0, len(ppn.errors_) ), ppn.errors_, marker=’o’)
plt.xlabel(’Epochs’)
plt.ylabel(’Number of updates’)
plt.show()

class SLP:
  def __init__(self, perceptron1, perceptron2, perceptron3):
    self.perceptron1 = perceptron1
    self.perceptron2 = perceptron2
    self.perceptron3 = perceptron3
```