import pandas as pd  
import numpy as np  
import matplotlib.pyplot as plt  
from sklearn.linear\_model import LinearRegression  
from sklearn.preprocessing import MinMaxScaler  
  
  
file\_path = 'E:\\机器学习\\机器学习作业\_数据/regress\_data1.csv'  
data = pd.read\_csv(file\_path)  
  
  
X = data.iloc[:, 0].values.reshape(-1, 1)  
y = data.iloc[:, 1].values  
  
  
scaler\_X = MinMaxScaler()  
X\_normalized = scaler\_X.fit\_transform(X)  
  
  
model = LinearRegression()  
model.fit(X\_normalized, y)  
  
  
plt.scatter(X, y, color='blue', label='Original Data')  
  
  
X\_plot = np.linspace(min(X), max(X), 100).reshape(-1, 1)  
X\_plot\_normalized = scaler\_X.transform(X\_plot)  
y\_plot = model.predict(X\_plot\_normalized)  
plt.plot(X\_plot, y\_plot, color='red', linewidth=2, label='Linear Regression (Normalized)')  
  
  
plt.legend(loc='upper left')  
plt.xlabel('Population')  
plt.ylabel('Income')  
plt.title('Linear Regression Model with Normalization')  
plt.show()