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import pandas as pd

import matplotlib.pyplot as plt

df = pd.read_csv("Linear Regression - Sheet1.csv")


m = 0
c = 0

def grad_m(df, m, c):
    total_grad_m = 0.0
    for i in range(df.shape[0]):
        total_grad_m += (-2.0/df.shape[0])*df.iloc[i,0]*(df.iloc[i,1] - m*df.iloc[i,0] - c)
    return total_grad_m


def grad_c(df, m , c):
    total_grad_c = 0.0
    for i in range(df.shape[0]):
        total_grad_c += (-2.0/df.shape[0])*(df.iloc[i, 1] - m * df.iloc[i, 0] - c)
    return total_grad_c


def train(x, slope, rate):
    return x - rate*slope


for i in range(1000):
    m = train(m, grad_m(df,m,c), 3e-5)
    c = train(c, grad_c(df,m,c), 0.01)


plt.scatter(df["X"],df["Y"],color = "black")

x_list = []
y_list = []

for i in range(1,301):
    x_list.append(i)
    y_list.append(m*i+c)

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plt.plot(x_list, y_list, color = "blue")  
plt.show()
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