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import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
from sklearn.linear_model import LinearRegression

# Dataset
data = {
    "weight": [140, 155, 159, 179, 192, 200, 212],
    "height": [60, 62, 67, 70, 71, 72, 75],
}
df = pd.DataFrame(data)

# Fit Linear Regression Model
X = df[['height']] # Predictor (independent variable)
y = df['weight'] # Response (dependent variable)

model = LinearRegression()
model.fit(X, y)

LinearRegression()

# Get predictions
df['predicted_weight'] = model.predict(X)

# Plot using Seaborn
plt.figure(figsize=(8, 6))
sns.scatterplot(x='height', y='weight', data=df, color='blue',
label='Actual Data')
sns.lineplot(x='height', y='predicted_weight', data=df, color='red',
label='Regression Line')
plt.title('Linear Regression Model: Weight vs Height')
plt.xlabel('Height (in inches)')
plt.ylabel('Weight (in lbs)')
plt.legend()
plt.grid()
plt.show()

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