HOME ASSIGNMENT:

```python
import pandas as pd
import matplotlib.pyplot as plt
from sklearn.linear_model import LinearRegression

# Step 1: Create the dataset
data = {
    'Area': [1500, 1800, 2000, 2200, 2500, 2800, 3000, 3500, 4000, 4500],
    'Price': [400000, 450000, 475000, 510000, 550000, 600000, 625000, 650000, 700000, 750000]
}

df = pd.DataFrame(data)

# Step 2: Prepare the data for Linear Regression
X = df[['Area']]  # Feature (independent variable)
y = df['Price']    # Target (dependent variable)

# Step 3: Create and fit the Linear Regression model
model = LinearRegression()
model.fit(X, y)

# Step 4: Predict prices for specified areas
areas_to_predict = [[5000], [8000], [9000]]
predictions = model.predict(areas_to_predict)

# Print predicted prices
for area, price in zip([5000, 8000, 9000], predictions):
    print(f"Predicted price for a house with area {area} sqft: ${price:,.2f}")

# Step 5: Plot the data and regression line
plt.figure(figsize=(8, 6))
plt.scatter(df['Area'], df['Price'], color='blue', label='Data Points')
plt.plot(df['Area'], model.predict(X), color='red', label='Regression Line')
plt.scatter([area[0] for area in areas_to_predict], predictions, color='green', label='Predictions', marker='o')
plt.title('Price vs Area with Regression Line')
plt.xlabel('Area (sqft)')
plt.ylabel('Price ($)')
plt.legend()
plt.grid(True)
plt.show()
```

```
Predicted price for a house with area 5000 sqft: $825,030.11
Predicted price for a house with area 8000 sqft: $1,168,314.03
Predicted price for a house with area 9000 sqft: $1,282,742.01
```