Home Assignment – 2

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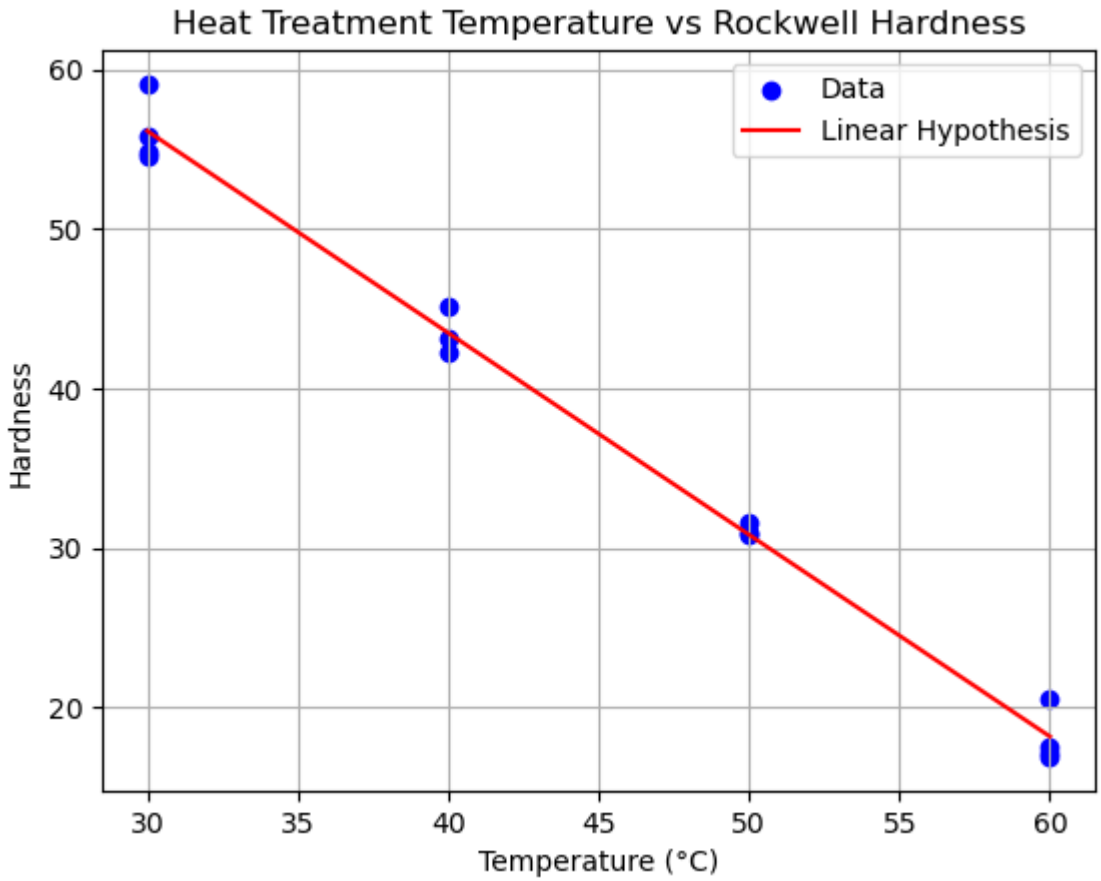
Problem:

Write a computer program to compute and plot a linear hypothesis over the given data. Also find the coefficient of determination.

Solution Algorithm:

1. **Data Preparation**:
    - Arrays of temperature and hardness values are defined.
2. **Linear Hypothesis (Linear Regression)**:
    - linregress from scipy.stats: used to perform linear regression on the data.
    - It returns several values:
        - slope: The slope of the regression line.
        - intercept: The y-intercept of the regression line.
        - r_value: The correlation coefficient (r).
        - p_value: The p-value of the test (not used here).
        - std_err: The standard error of the estimate (not used here).
    - **Linear Hypothesis: Hardness = -1.27 * Temperature + 94.13**
3. **Plotting**:
    - Create a plot with individual data points (hardness versus temperature).
    - Plot the line of best fit (linear hypothesis line) according to the regression model.



4. **Coefficient of Determination**:
    - The coefficient of determination (R-squared) is computed as the square of the correlation coefficient (r_value**2).
    - R-squared measures how well the regression line approximates the real data points. It ranges from 0 to 1, where 1 indicates a perfect fit.
    - **Coefficient of Determination: 0.9915**