**Exercise: Understanding MSE, MAE, and RMSE with Small Datasets**

*By completing these exercises, you will practice calculating regression evaluation metrics manually and understand their significance.*

1. You are predicting the delivery time of packages (in minutes) based on the distance (in kilometers) to the destination. Below is the dataset:

|  |  |  |  |
| --- | --- | --- | --- |
| Distance (km) | Delivery Time | Predicted |  |
| 2.5 | 30 | 28 |  |
| 5.0 | 45 | 50 |  |
| 7.5 | 60 | 65 |  |
| 10.0 | 80 | 85 |  |
| 12.5 | 100 | 110 |  |

Questions:

1. Which column is the feature, and which is the target?

2. Calculate the **MSE**, **MAE**, **RMSE** for the dataset.

3. What are the units of each metric?

1. You are predicting the daily energy consumption (in kWh) of a household based on the average temperature (in °C) of the day. Below is the dataset:

|  |  |  |  |
| --- | --- | --- | --- |
| Temperature (°C) | Energy Consumption (kWh) | Predicted |  |
| 15 | 20.5 | 21 |  |
| 18 | 18 | 17.5 |  |
| 22 | 16 | 15 |  |
| 25 | 14.5 | 13 |  |
| 30 | 12 | 12.5 |  |
| 30.5 | 10 | 11 |  |
| 40 | 8 | 9 |  |

Questions:

1. Which column is the feature, and which is the target?

2. Calculate the **MSE**, **MAE**, **RMSE** for the dataset.

3. What are the units of each metric?